

Ludwig-Maximilians-Universität München
Lehrstuhl für Datenbanksysteme und Data Mining
Prof. Dr. Thomas Seidl

Knowledge Discovery and Data Mining I

Winter Semester 2018/19



Agenda

DBSCAN

$\varepsilon = 1.1$ minPts= 2

$\varepsilon = 1.1$ minPts= 3

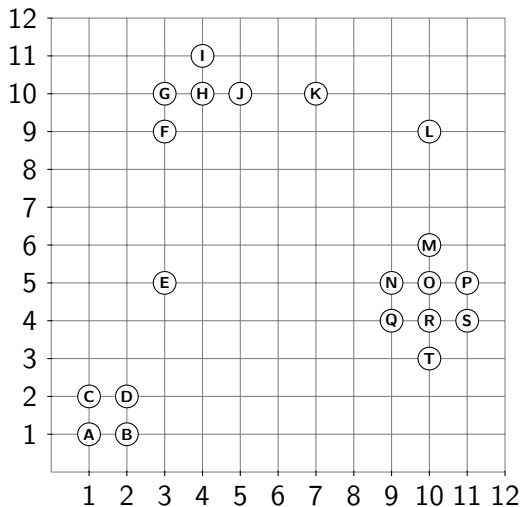
$\varepsilon = 1.1$ minPts= 4

$\varepsilon = 2.1$ minPts= 4

$\varepsilon = 4.1$ minPts= 5

$\varepsilon = 4.1$ minPts= 4

DBSCAN

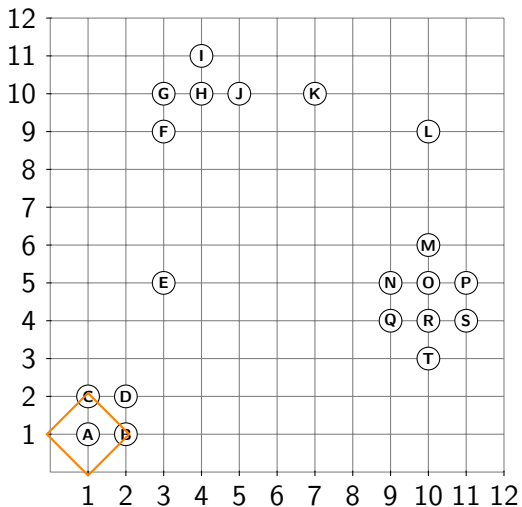


$$\epsilon = 1.1$$

$$\text{minPts} = 2$$

Seed list:

DBSCAN

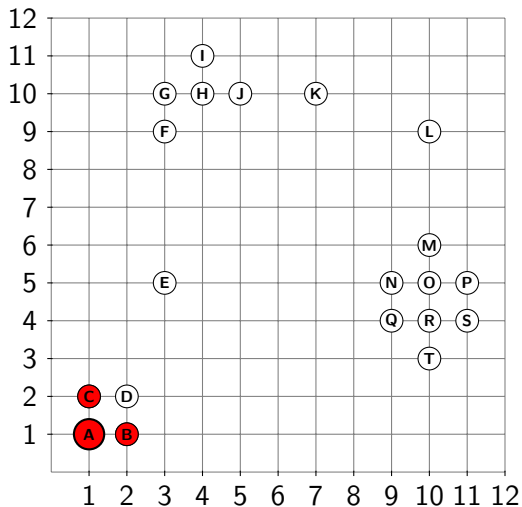


$$\epsilon = 1.1$$

$$\text{minPts} = 2$$

Seed list:

DBSCAN



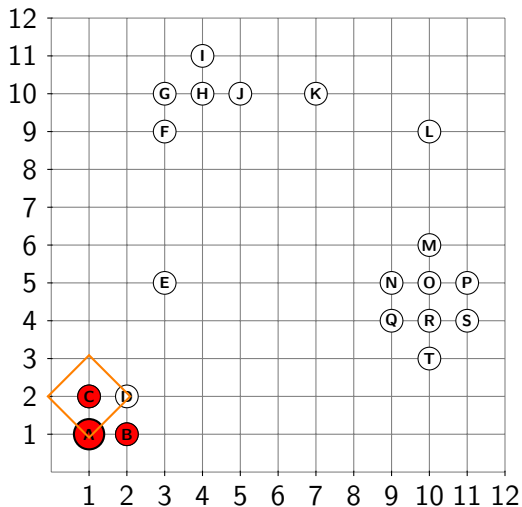
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$$\text{minPts} = 2$$

Seed list:

BC

DBSCAN



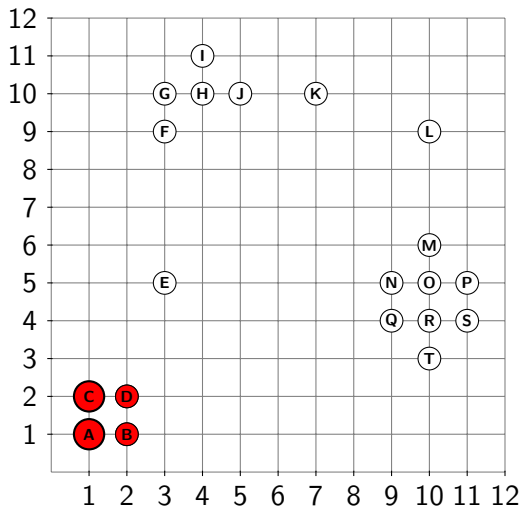
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$$\text{minPts} = 2$$

Seed list:

B

DBSCAN



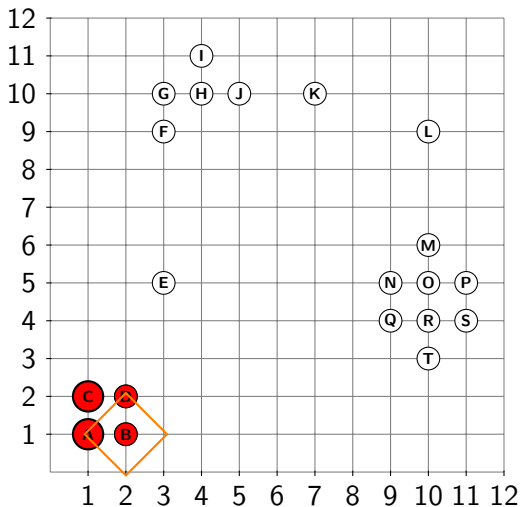
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Seed list:

BD

DBSCAN



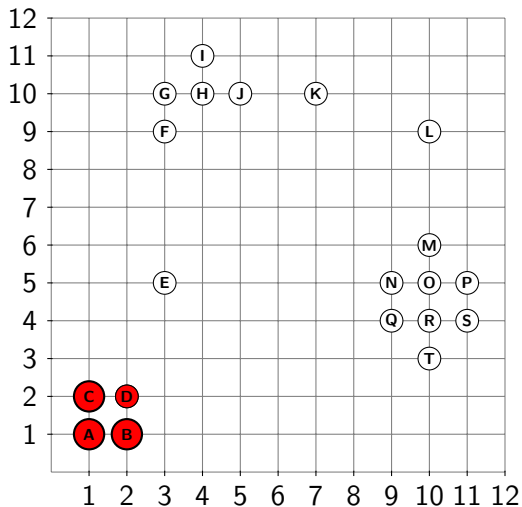
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$$\text{minPts} = 2$$

Seed list:

D

DBSCAN



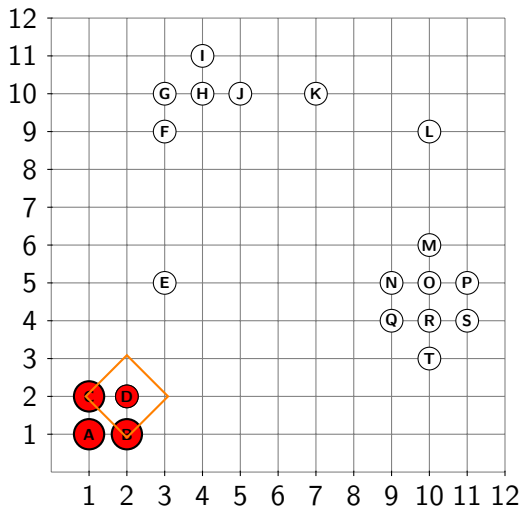
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Seed list:

D

DBSCAN

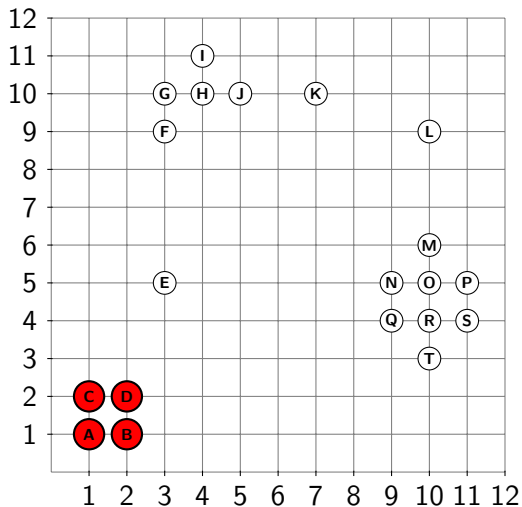


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$$\text{minPts} = 2$$

Seed list:

DBSCAN

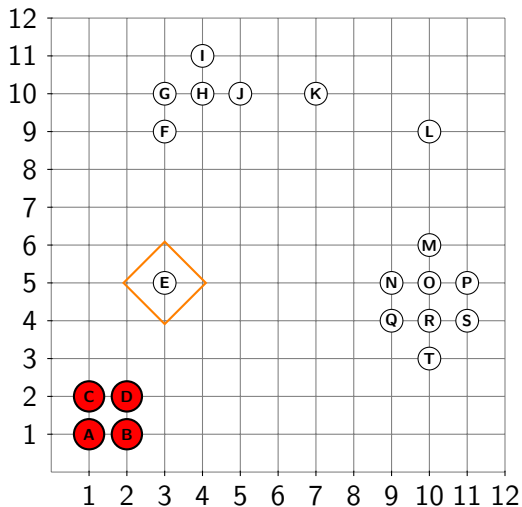


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Seed list:

DBSCAN

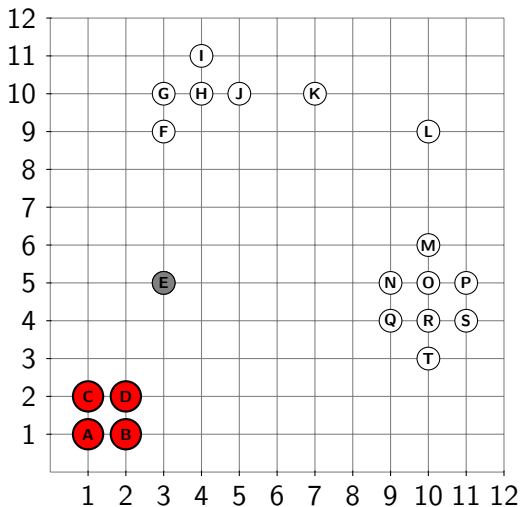


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Seed list:

DBSCAN

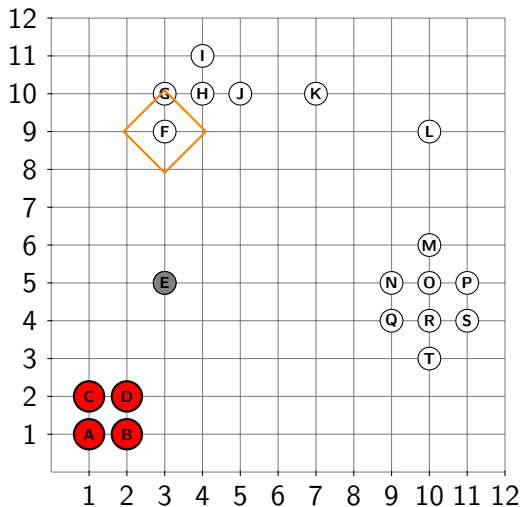


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Seed list:

DBSCAN

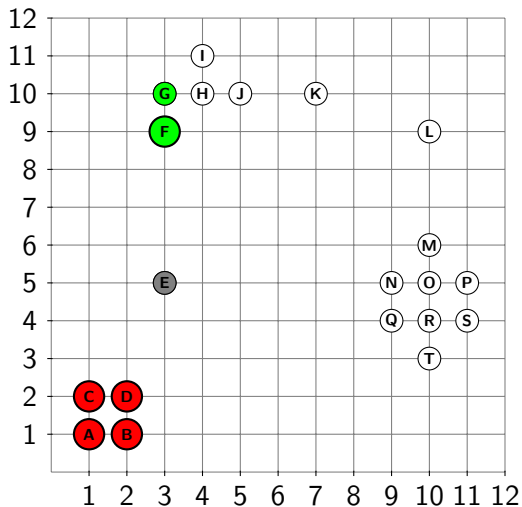


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Seed list:

DBSCAN



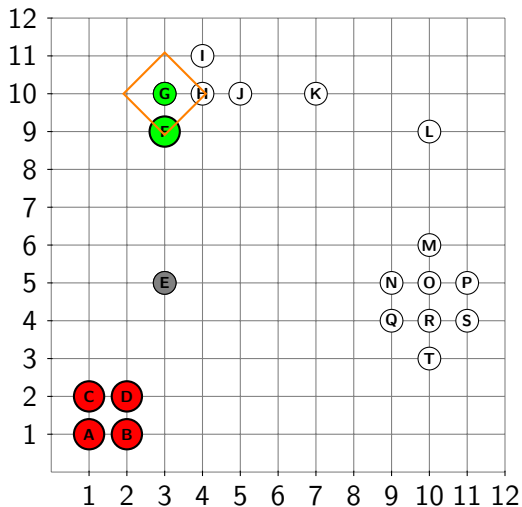
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Seed list:

G

DBSCAN

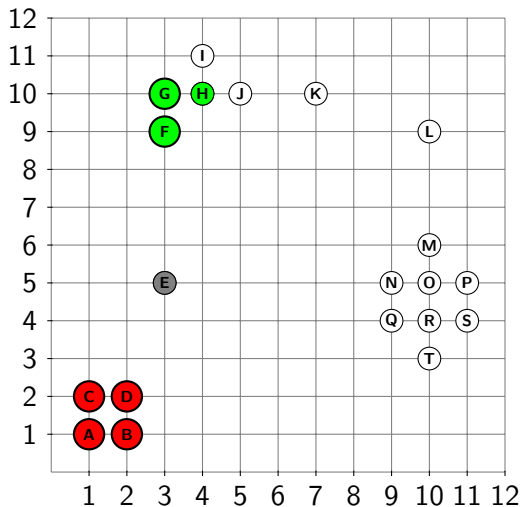


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Seed list:

DBSCAN



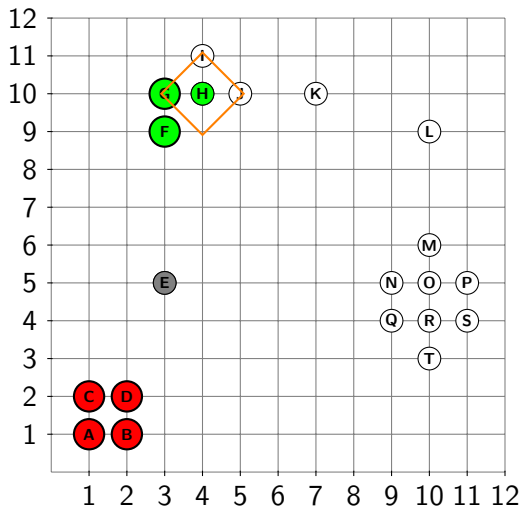
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Seed list:

H

DBSCAN

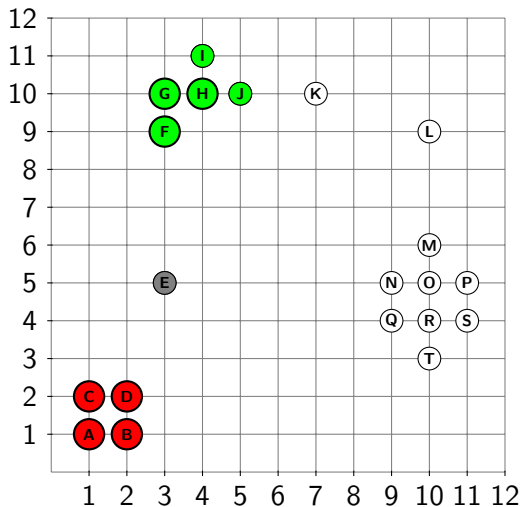


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$$\text{minPts} = 2$$

Seed list:

DBSCAN



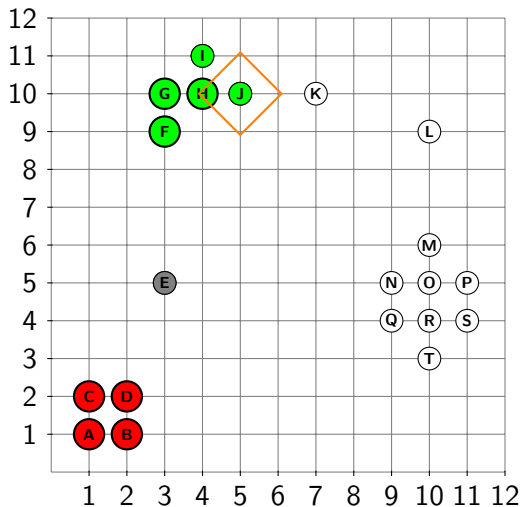
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Seed list:

IJ

DBSCAN



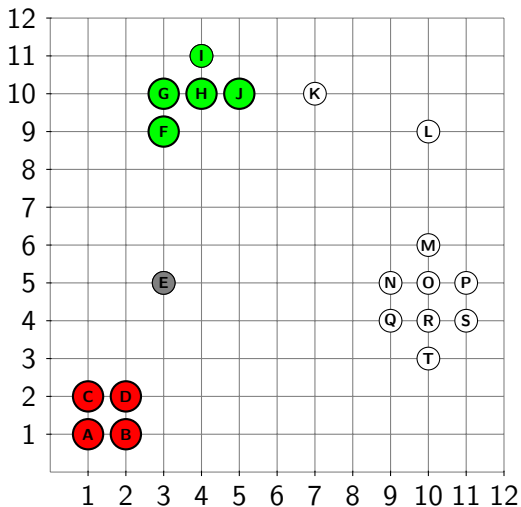
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Seed list:

I

DBSCAN



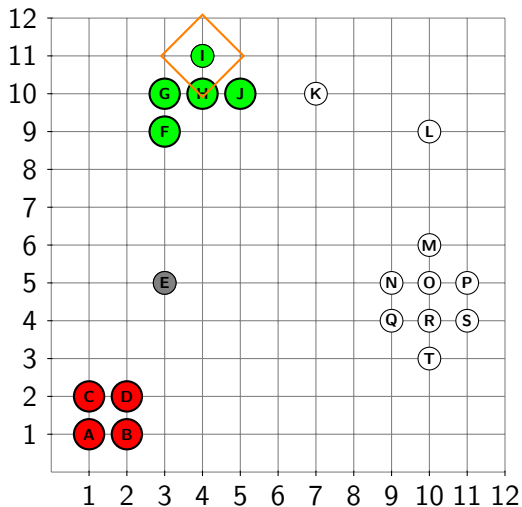
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Seed list:

I

DBSCAN

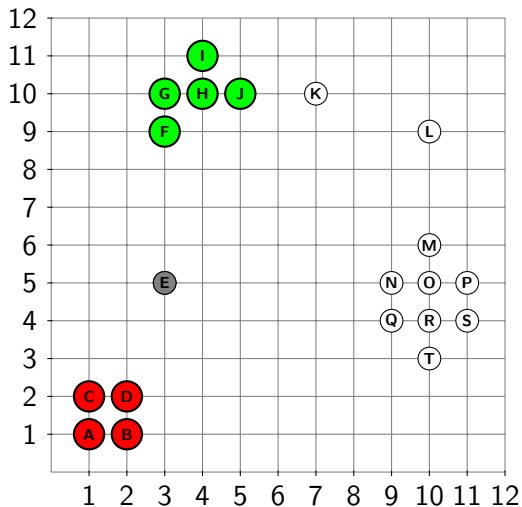


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Seed list:

DBSCAN

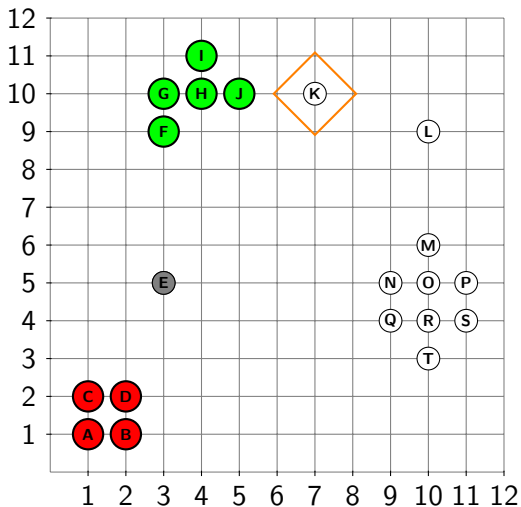


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Seed list:

DBSCAN

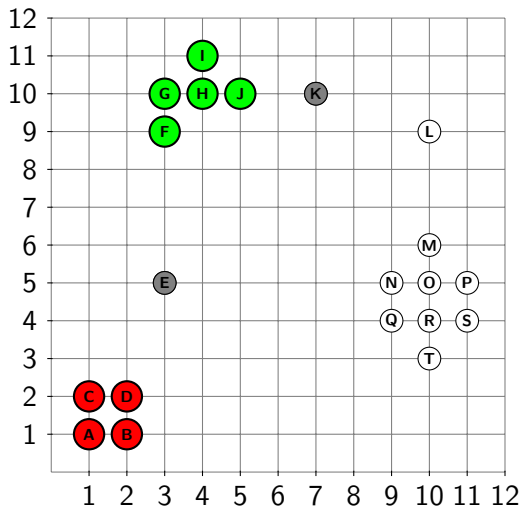


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Seed list:

DBSCAN

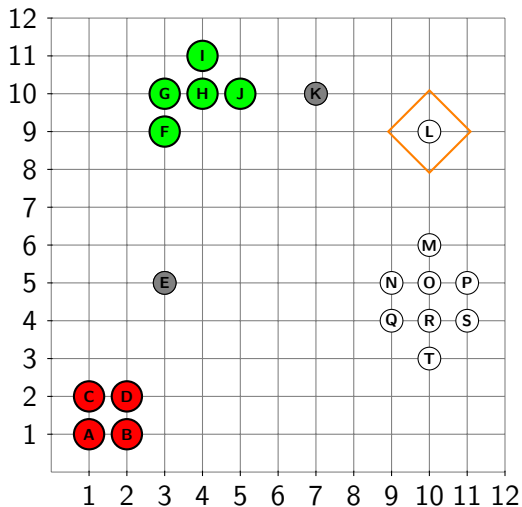


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Seed list:

DBSCAN

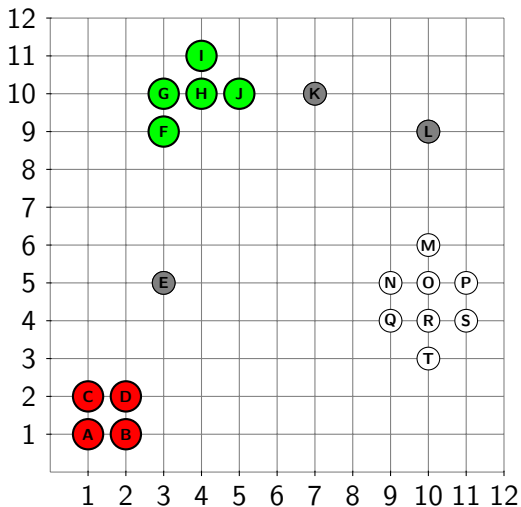


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$$\text{minPts} = 2$$

Seed list:

DBSCAN

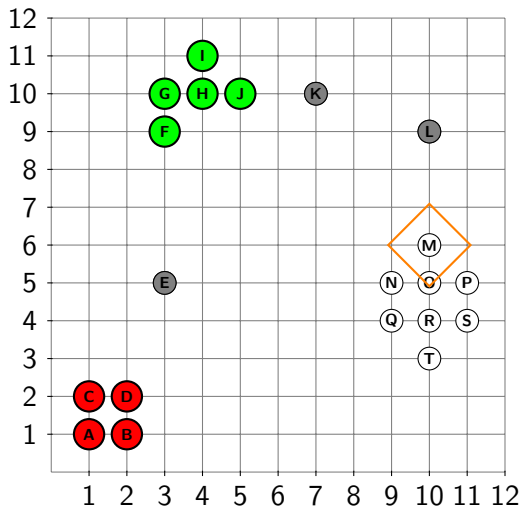


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Seed list:

DBSCAN

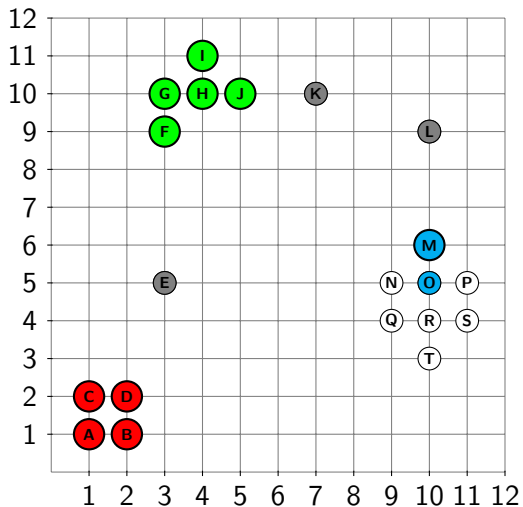


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Seed list:

DBSCAN



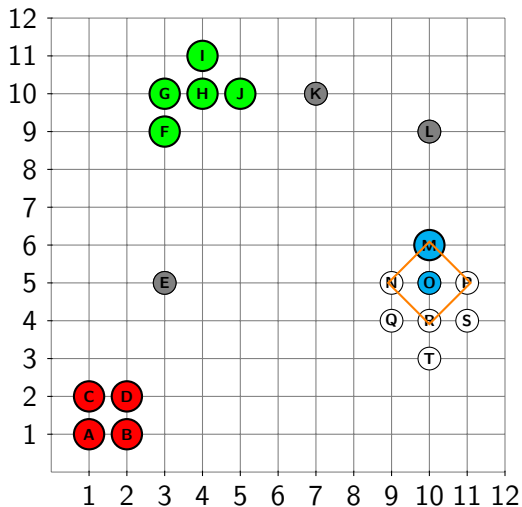
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$$\text{minPts} = 2$$

Seed list:

O

DBSCAN

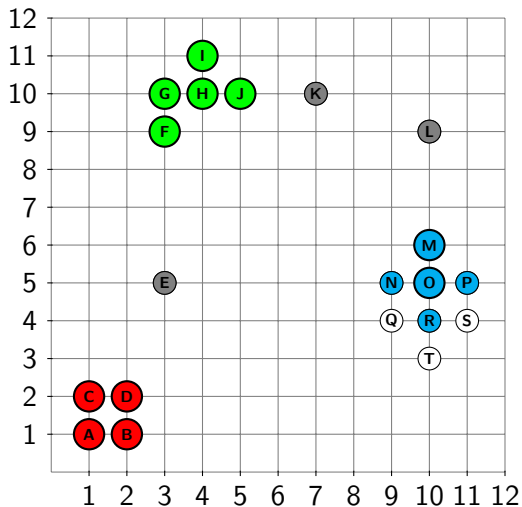


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$$\text{minPts} = 2$$

Seed list:

DBSCAN



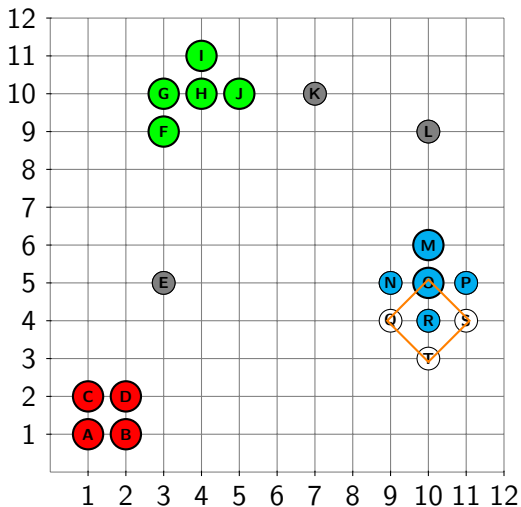
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Seed list:

NPR

DBSCAN



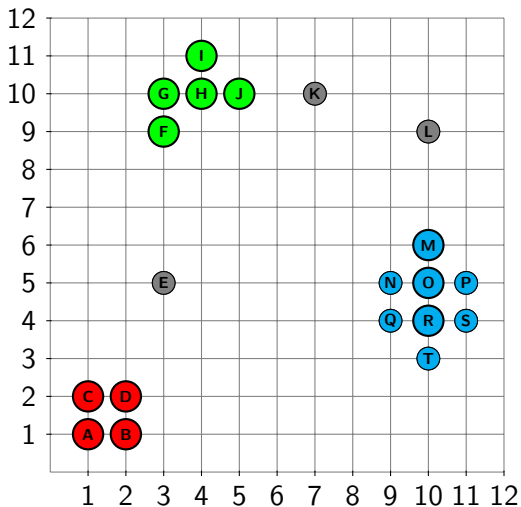
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Seed list:

NP

DBSCAN

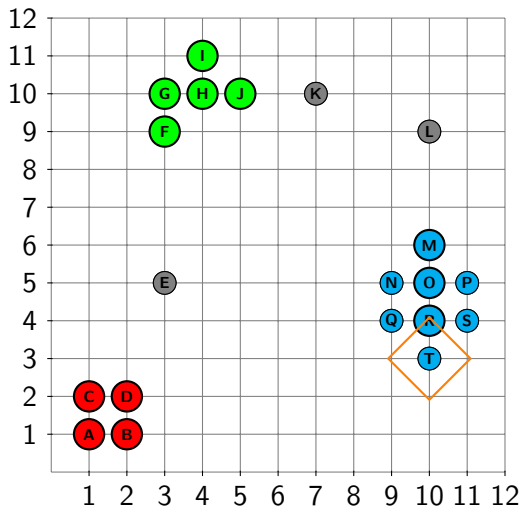


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Seed list:
NPQST

DBSCAN



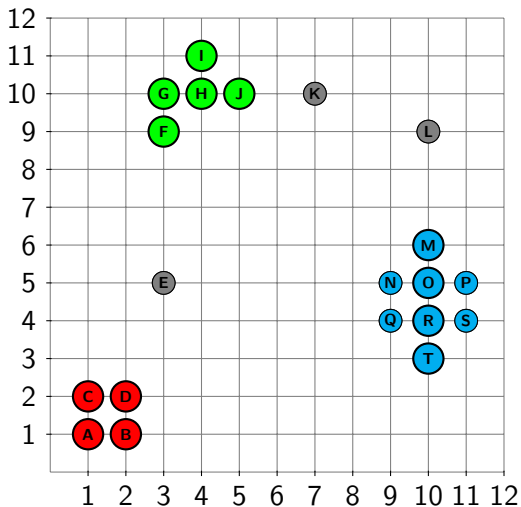
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Seed list:

NPQS

DBSCAN



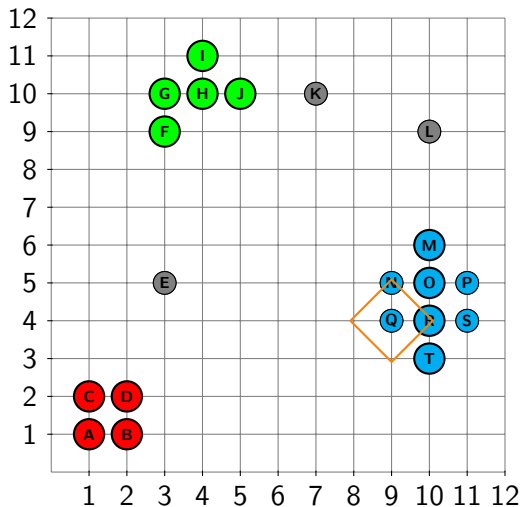
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Seed list:

NPQS

DBSCAN



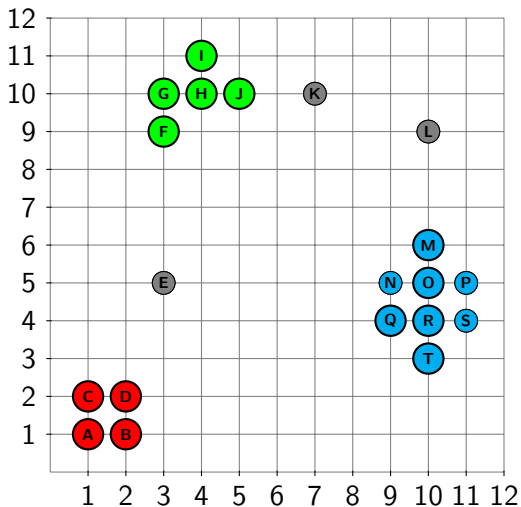
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$$\text{minPts} = 2$$

Seed list:

NPS

DBSCAN



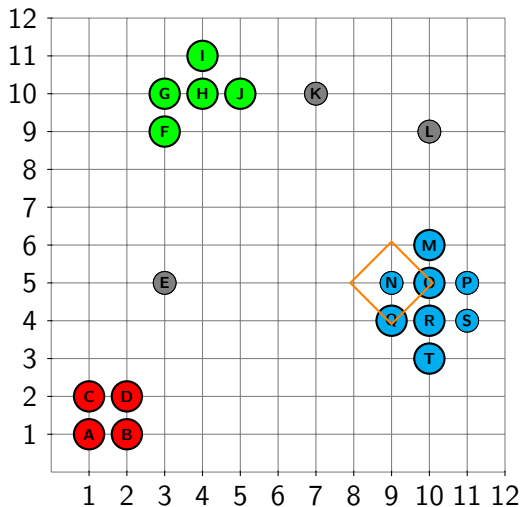
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Seed list:

NPS

DBSCAN



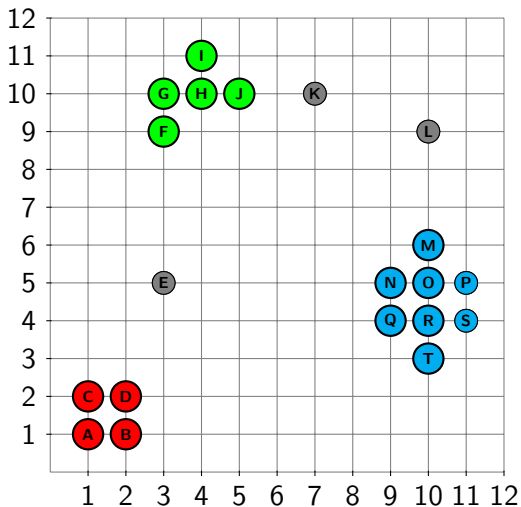
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Seed list:

PS

DBSCAN



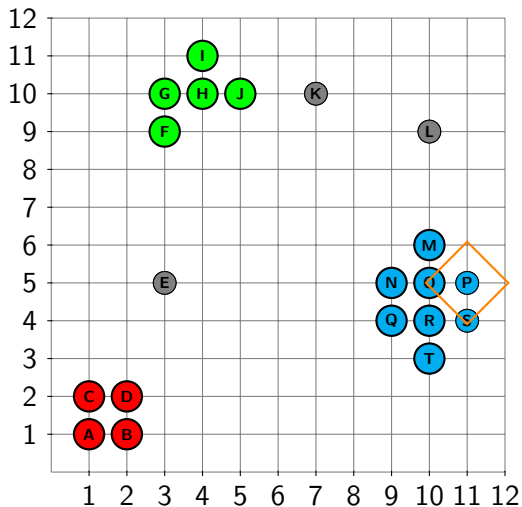
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$$\text{minPts} = 2$$

Seed list:

PS

DBSCAN



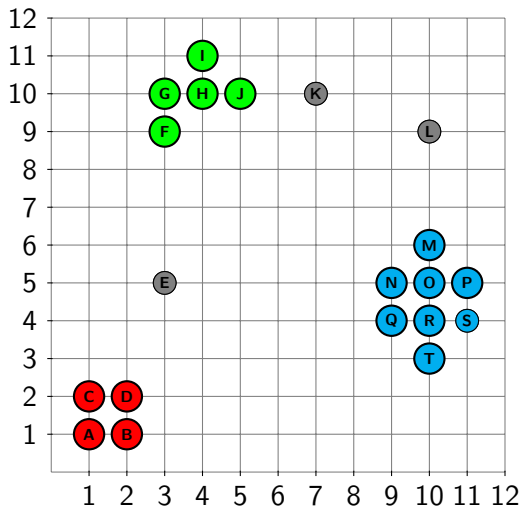
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$$\text{minPts} = 2$$

Seed list:

S

DBSCAN



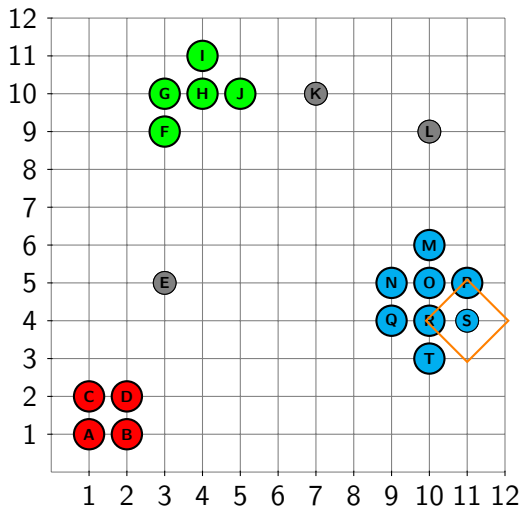
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$$\text{minPts} = 2$$

Seed list:

S

DBSCAN

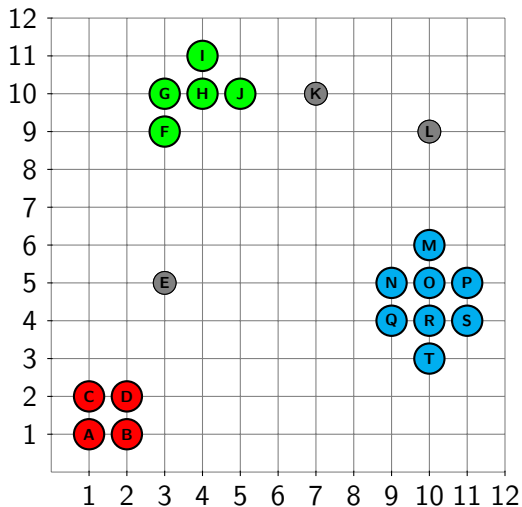


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$$\text{minPts} = 2$$

Seed list:

DBSCAN

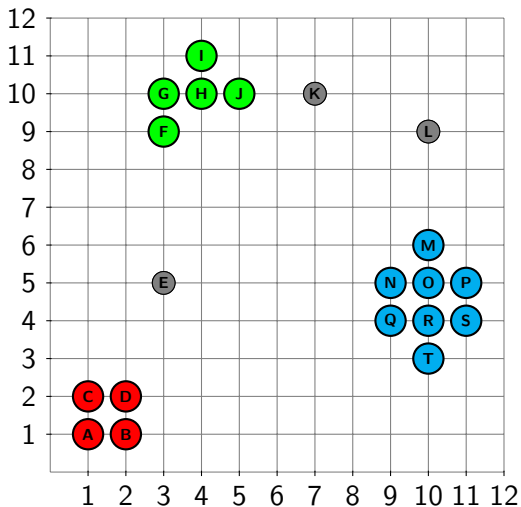


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Seed list:

DBSCAN



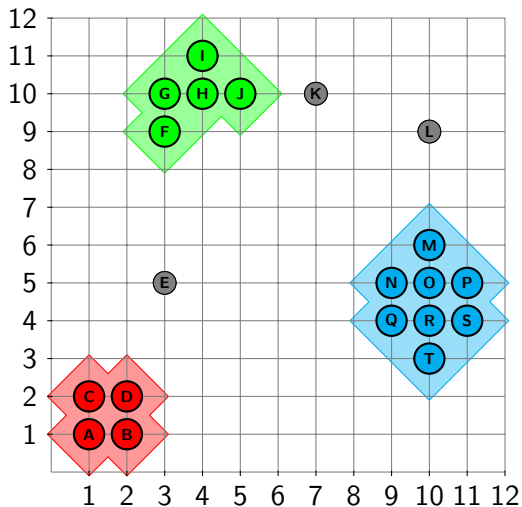
$$\varepsilon = 1.1$$

$$\text{minPts} = 2$$

Seed list:

No border
points!

DBSCAN



$$\epsilon = 1.1$$

$$\text{minPts} = 2$$

Seed list:

No border points!

Agenda

DBSCAN

$\varepsilon = 1.1$ minPts= 2

$\varepsilon = \mathbf{1.1}$ minPts= 3

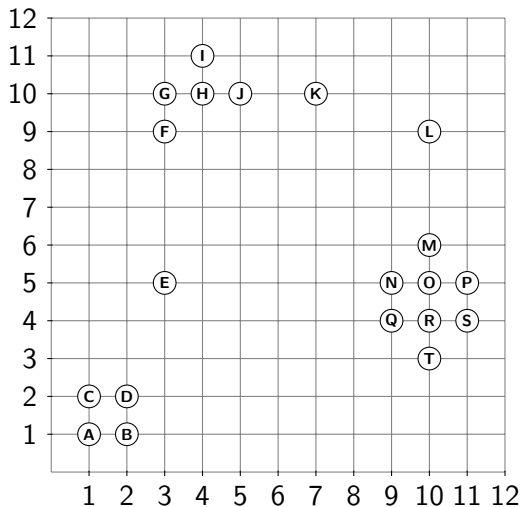
$\varepsilon = 1.1$ minPts= 4

$\varepsilon = 2.1$ minPts= 4

$\varepsilon = 4.1$ minPts= 5

$\varepsilon = 4.1$ minPts= 4

DBSCAN

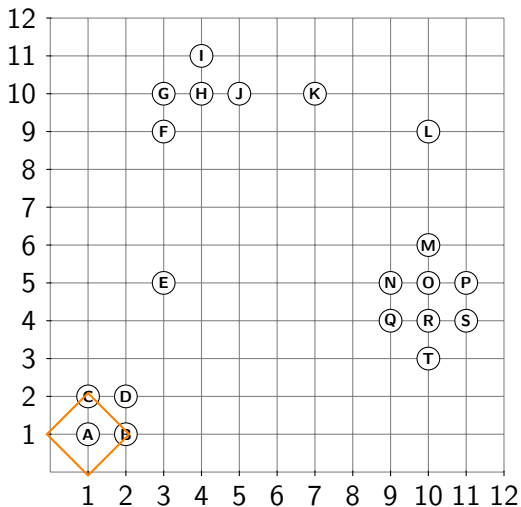


$$\epsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

DBSCAN

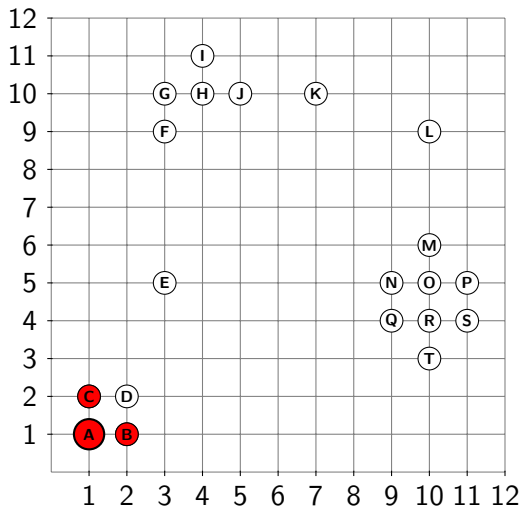


$$\epsilon = 1.1$$

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Seed list:

DBSCAN



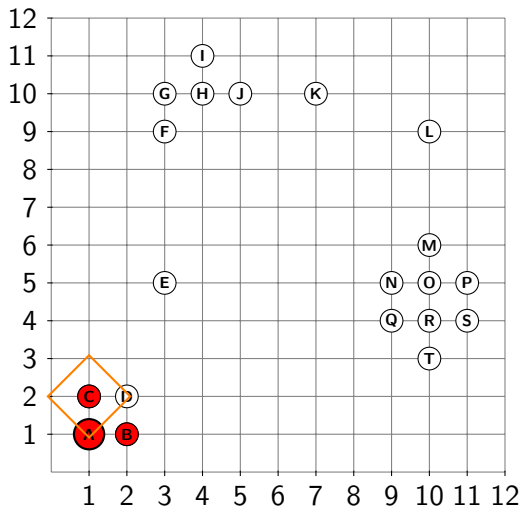
$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

BC

DBSCAN



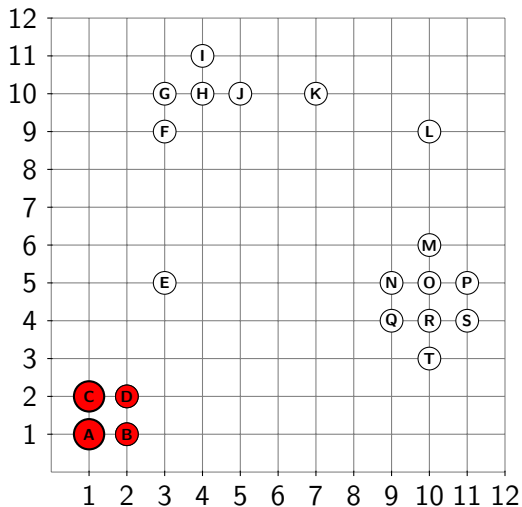
$$\epsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

B

DBSCAN



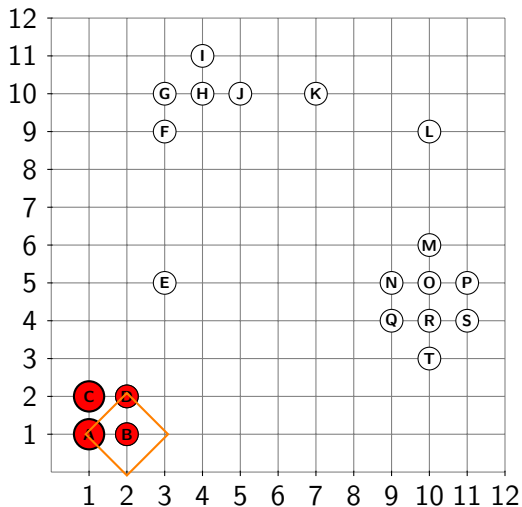
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Seed list:

BD

DBSCAN



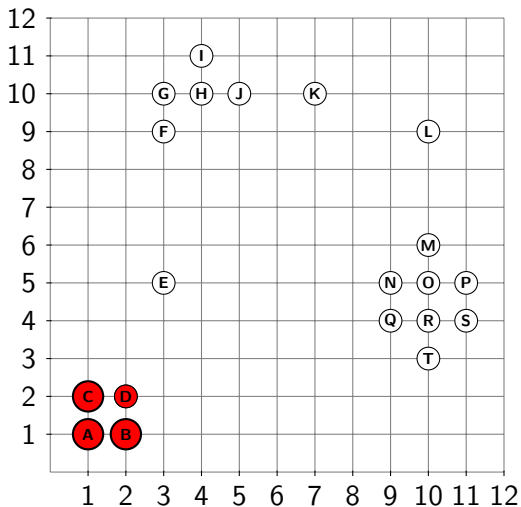
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$$\text{minPts} = 3$$

Seed list:

D

DBSCAN



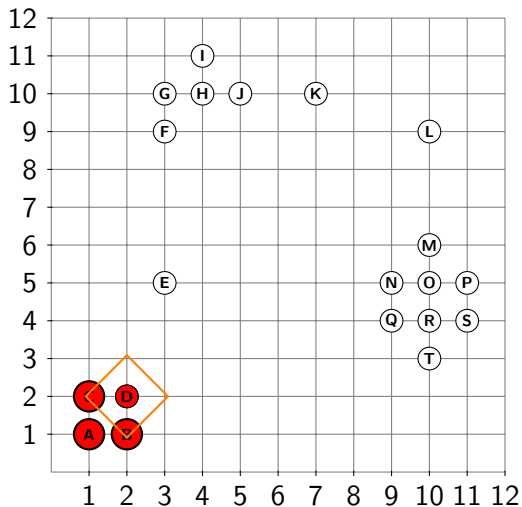
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Seed list:

D

DBSCAN

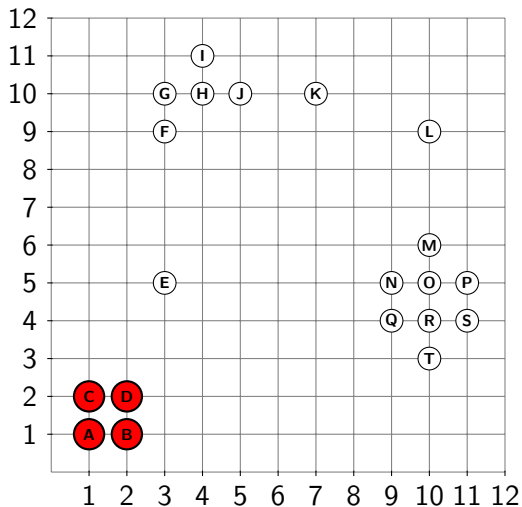


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Seed list:

DBSCAN

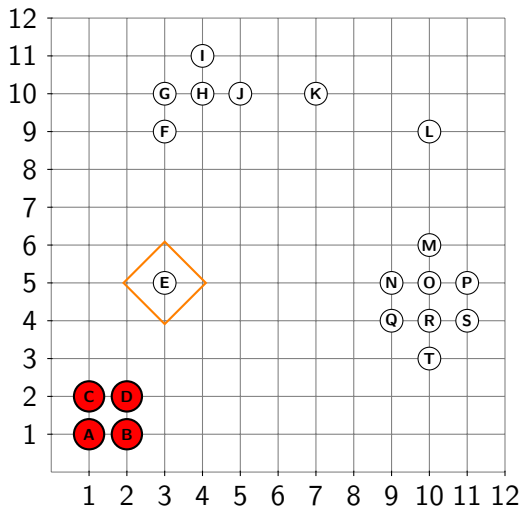


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Seed list:

DBSCAN

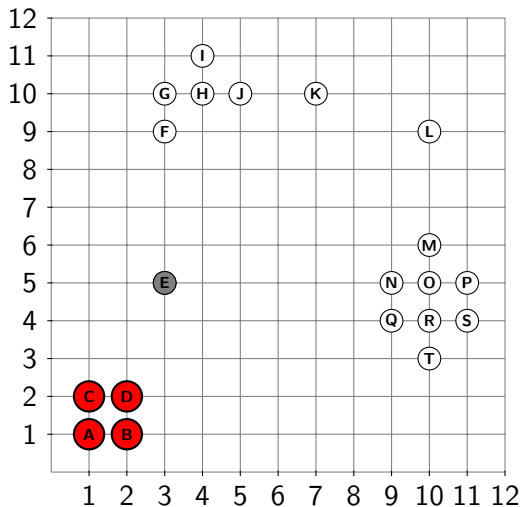


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Seed list:

DBSCAN

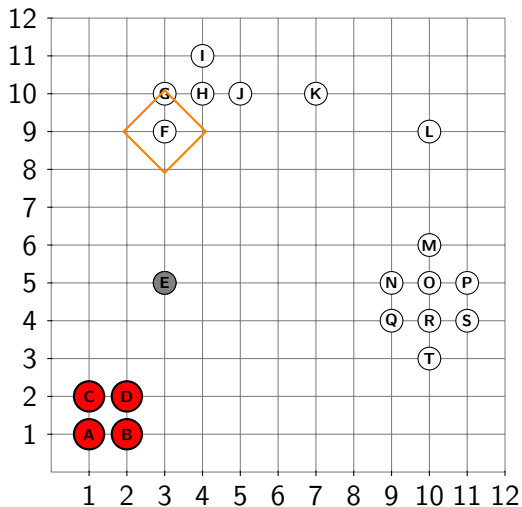


$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

DBSCAN

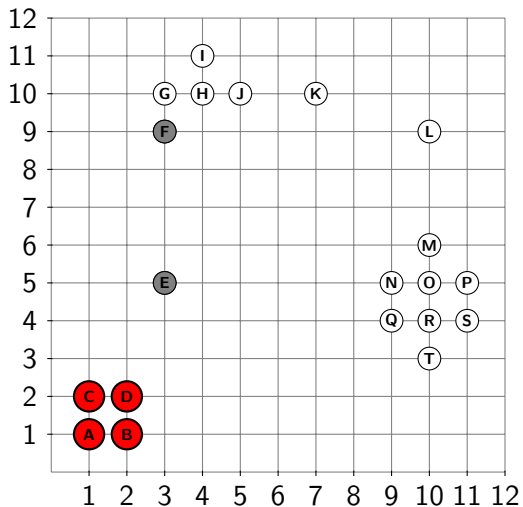


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Seed list:

DBSCAN

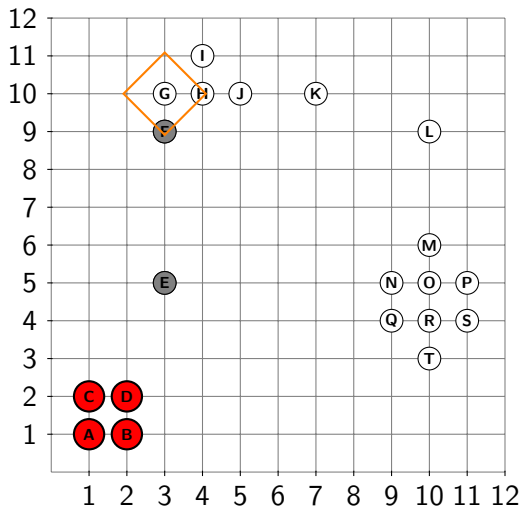


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Seed list:

DBSCAN

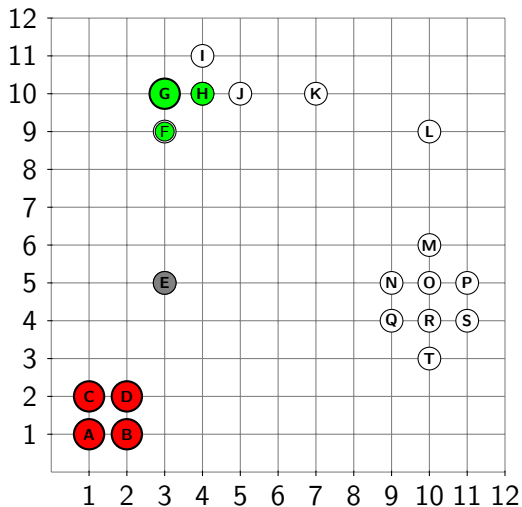


$$\epsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

DBSCAN



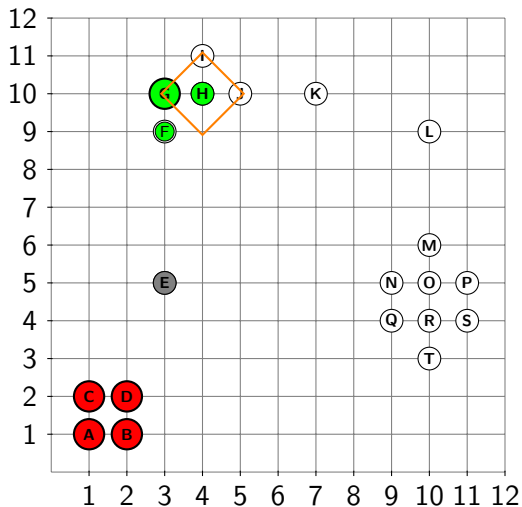
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Seed list:

H

DBSCAN

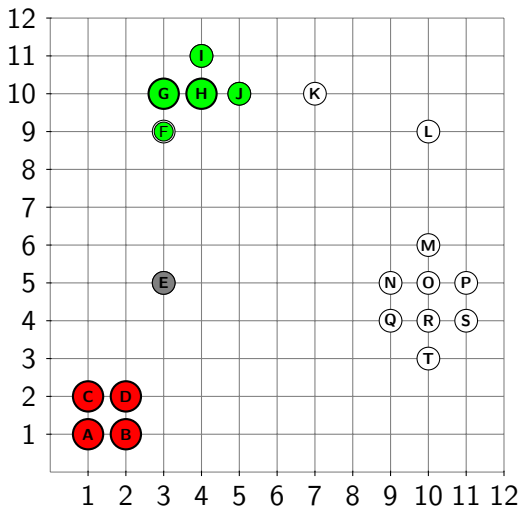


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Seed list:

DBSCAN



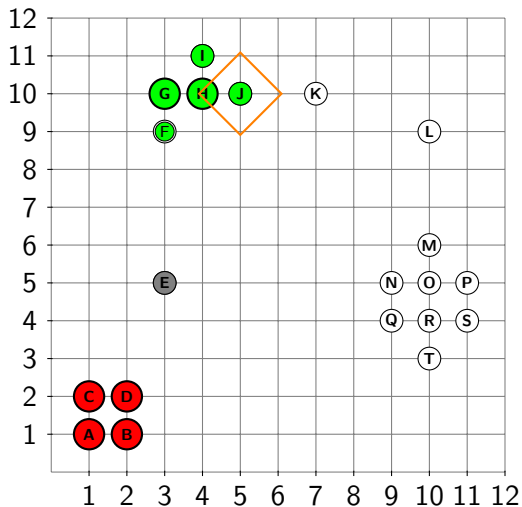
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$$\text{minPts} = 3$$

Seed list:

IJ

DBSCAN



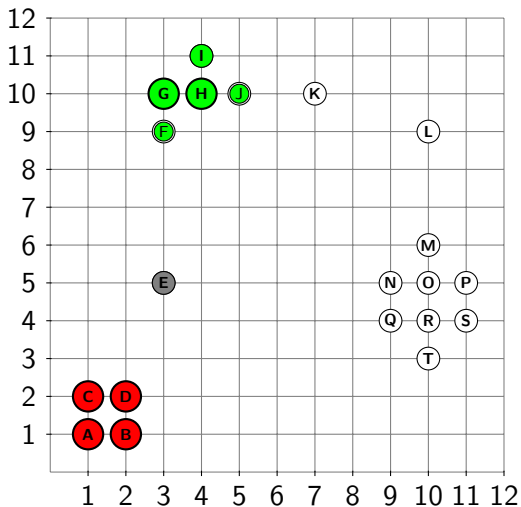
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$$\text{minPts} = 3$$

Seed list:

I

DBSCAN



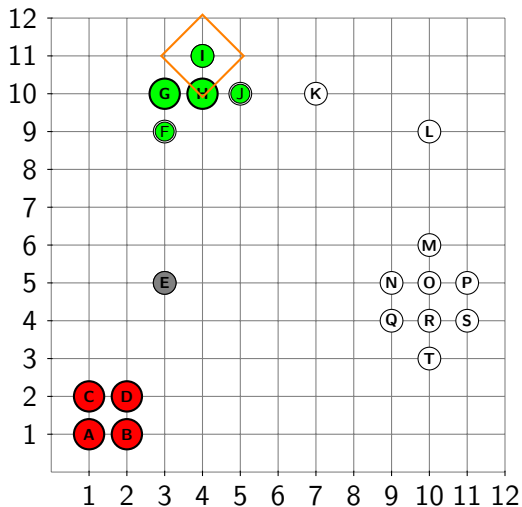
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Seed list:

I

DBSCAN

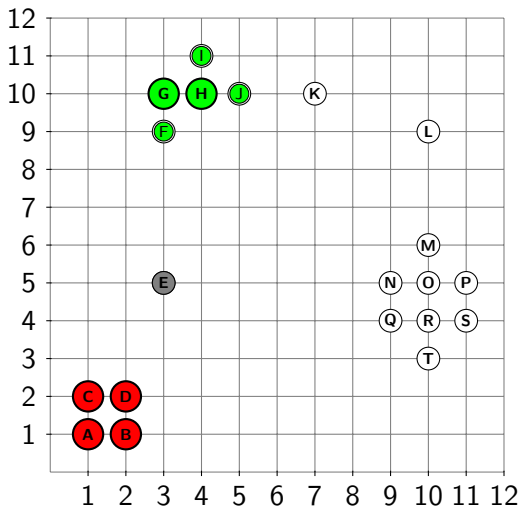


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Seed list:

DBSCAN

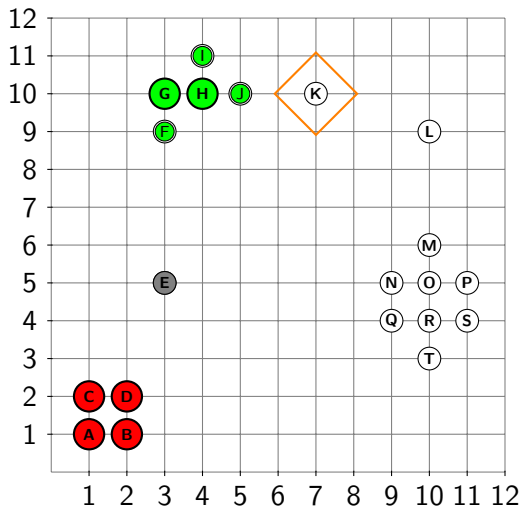


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$$\text{minPts} = 3$$

Seed list:

DBSCAN

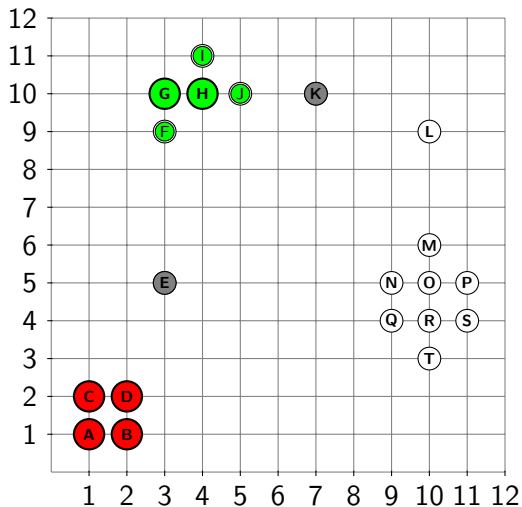


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Seed list:

DBSCAN

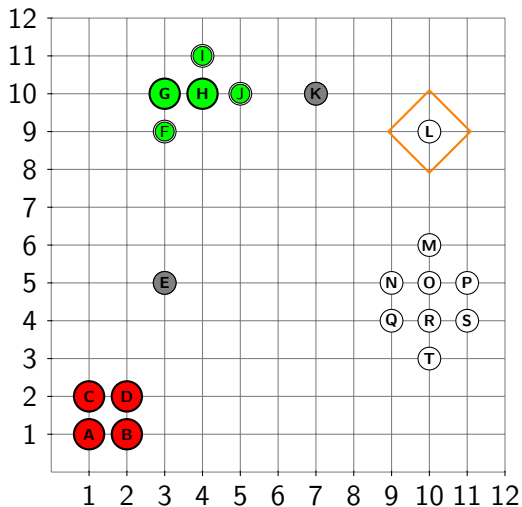


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Seed list:

DBSCAN

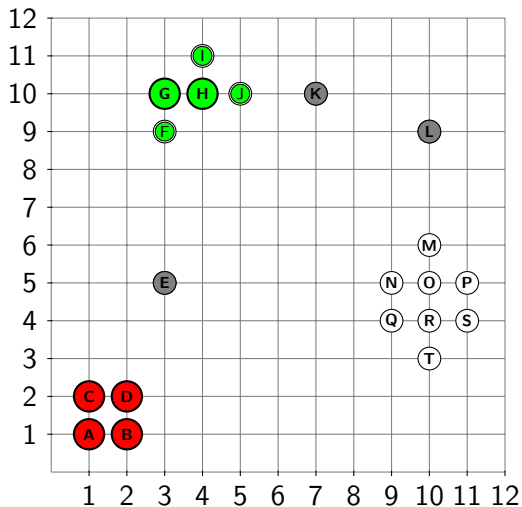


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Seed list:

DBSCAN

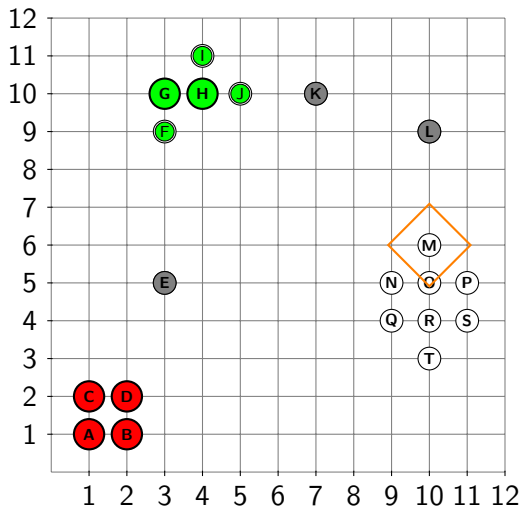


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$$\text{minPts} = 3$$

Seed list:

DBSCAN

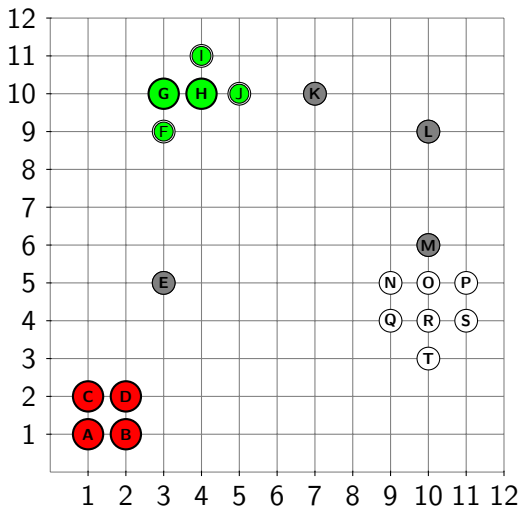


$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

DBSCAN

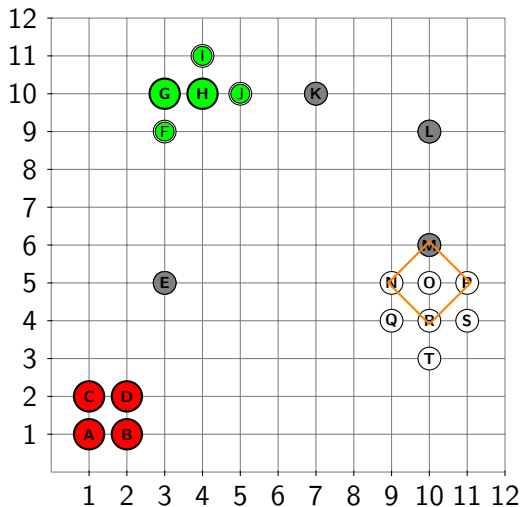


$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

DBSCAN

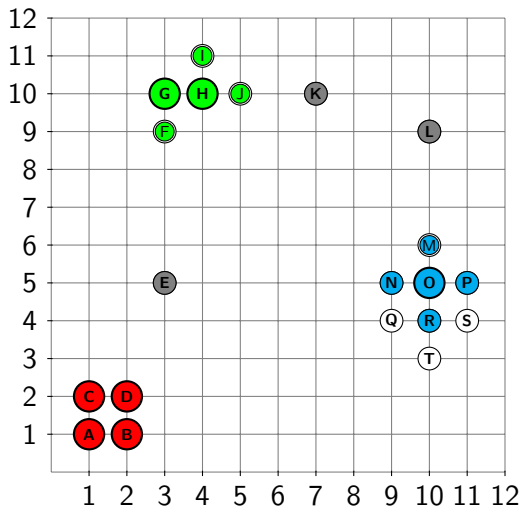


$$\epsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

DBSCAN



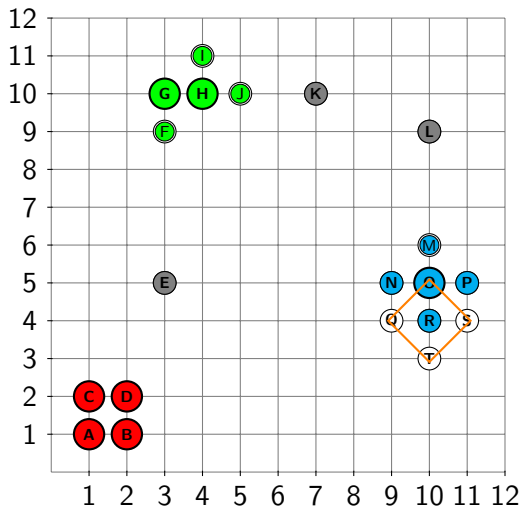
$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

NPR

DBSCAN



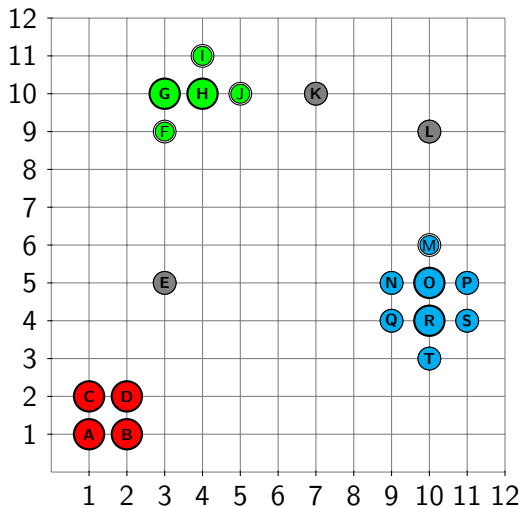
$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

NP

DBSCAN

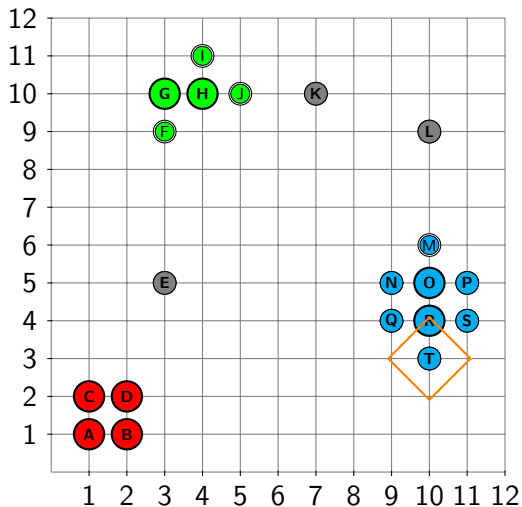


$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:
NPQST

DBSCAN



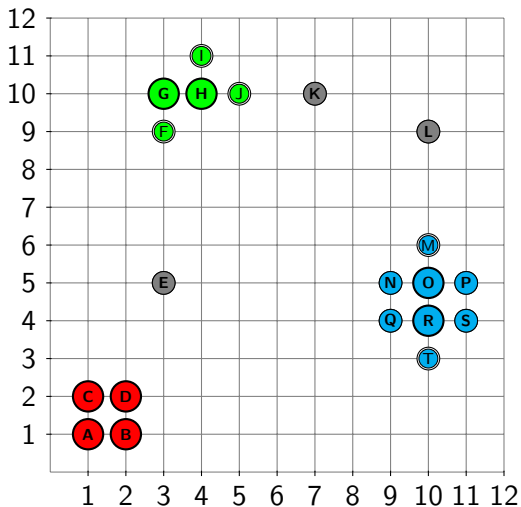
$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

NPQS

DBSCAN



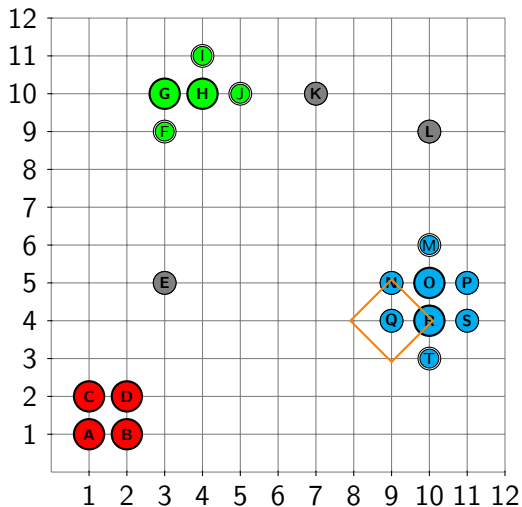
$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

NPQS

DBSCAN



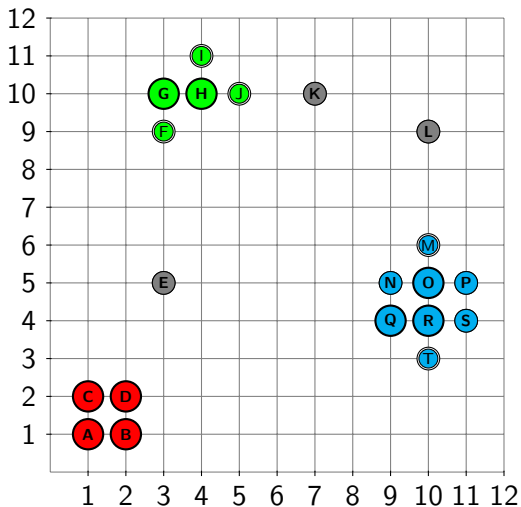
$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

NPS

DBSCAN



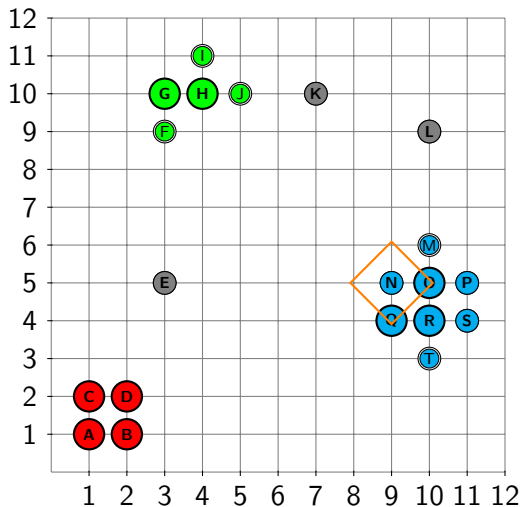
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$$\text{minPts} = 3$$

Seed list:

NPS

DBSCAN



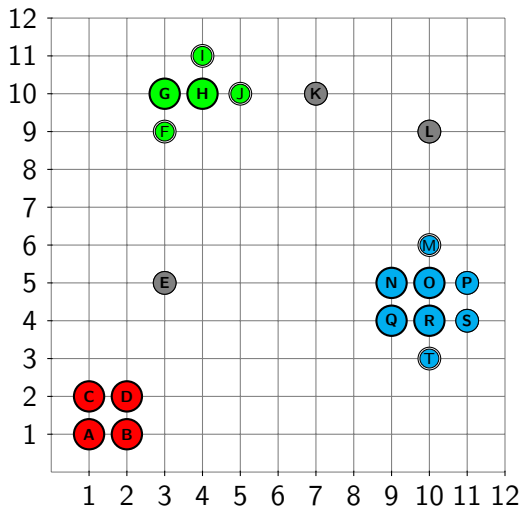
$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

PS

DBSCAN



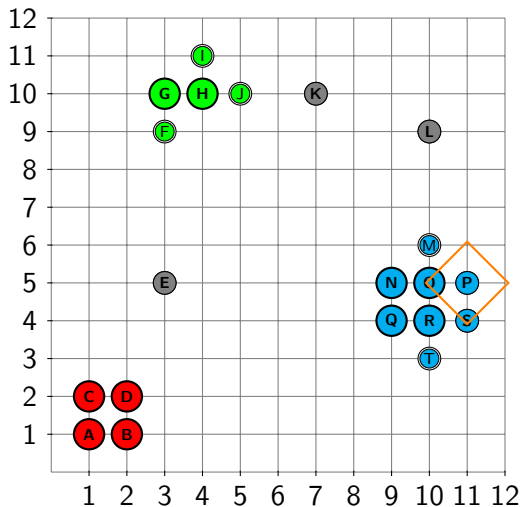
$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

PS

DBSCAN



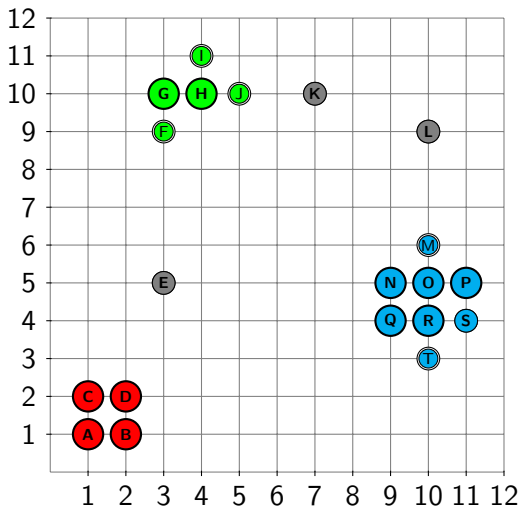
$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

S

DBSCAN



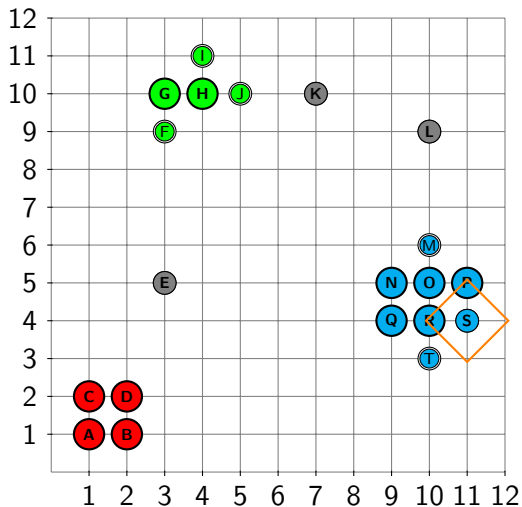
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$$\text{minPts} = 3$$

Seed list:

S

DBSCAN

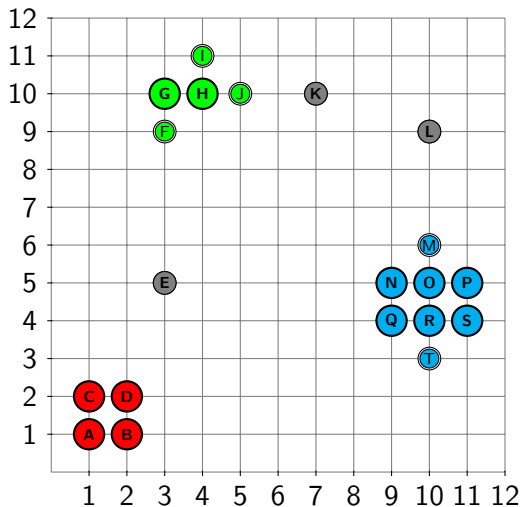


$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

DBSCAN

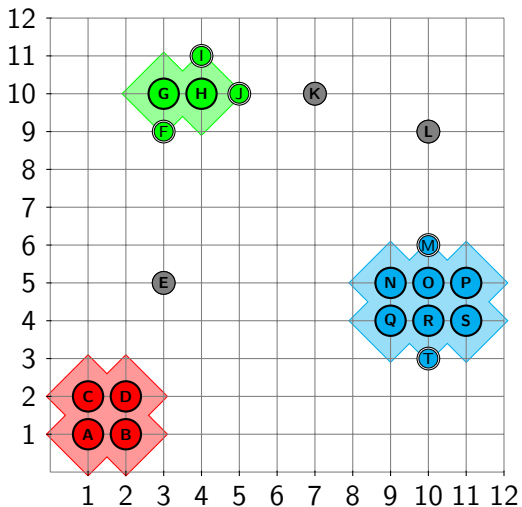


$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

DBSCAN



$$\varepsilon = 1.1$$

$$\text{minPts} = 3$$

Seed list:

Agenda

DBSCAN

$\varepsilon = 1.1$ minPts= 2

$\varepsilon = 1.1$ minPts= 3

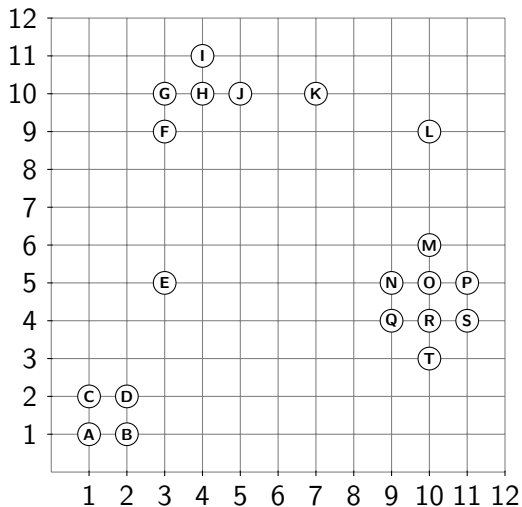
$\varepsilon = \mathbf{1.1}$ minPts= 4

$\varepsilon = 2.1$ minPts= 4

$\varepsilon = 4.1$ minPts= 5

$\varepsilon = 4.1$ minPts= 4

DBSCAN

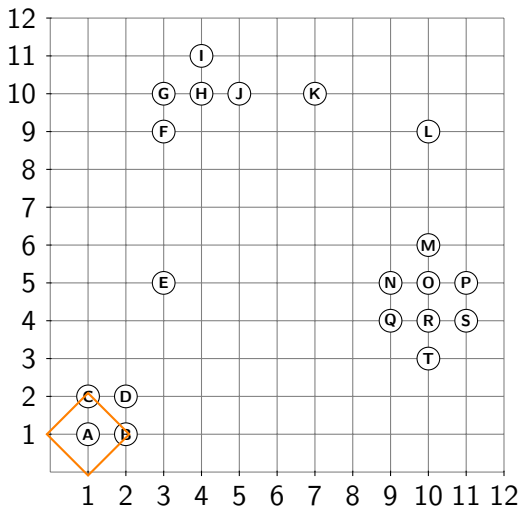


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

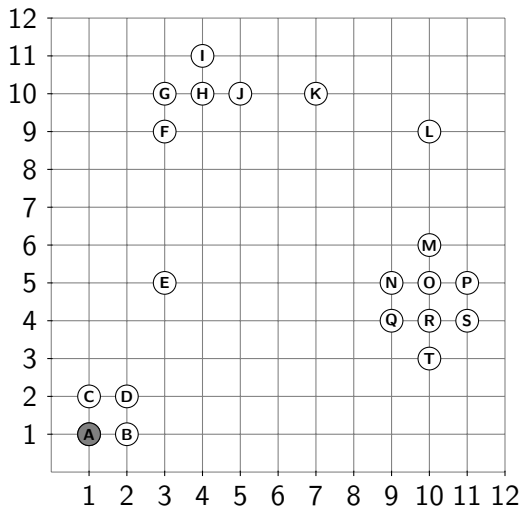


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$$\text{minPts} = 4$$

Seed list:

DBSCAN

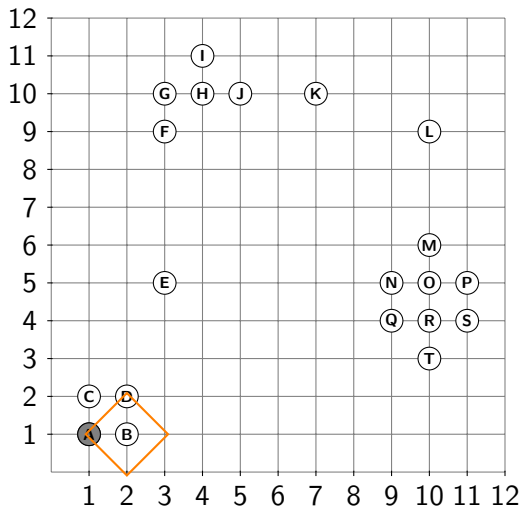


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

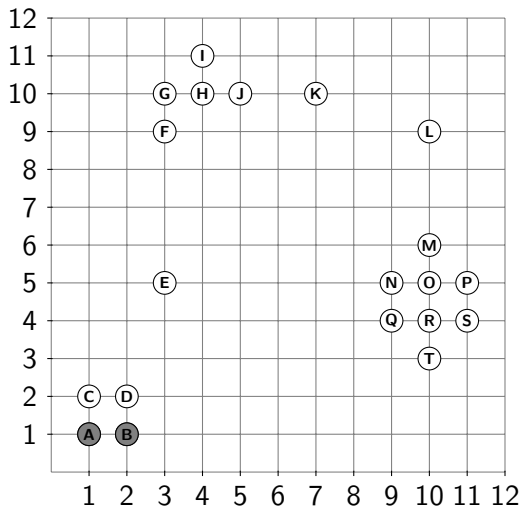


$$\epsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

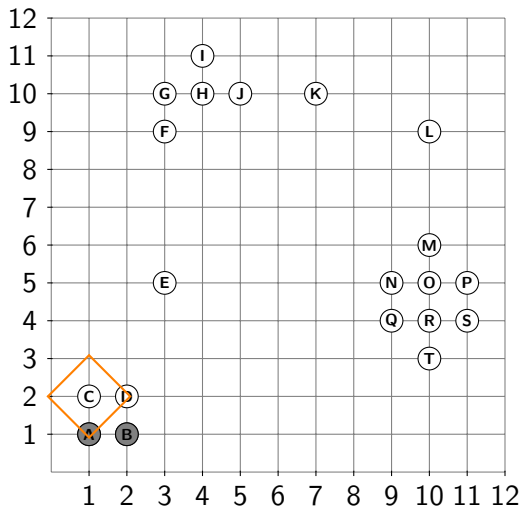


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

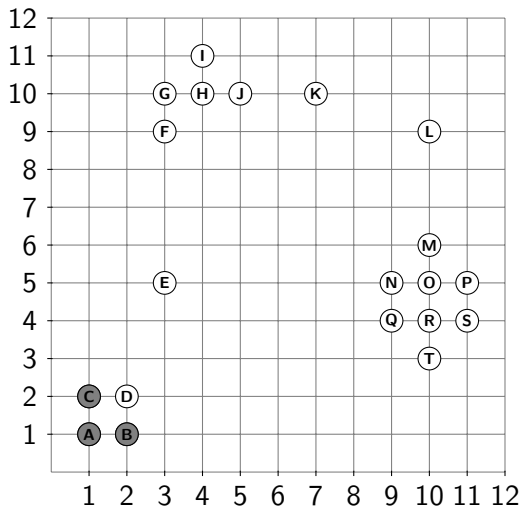


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

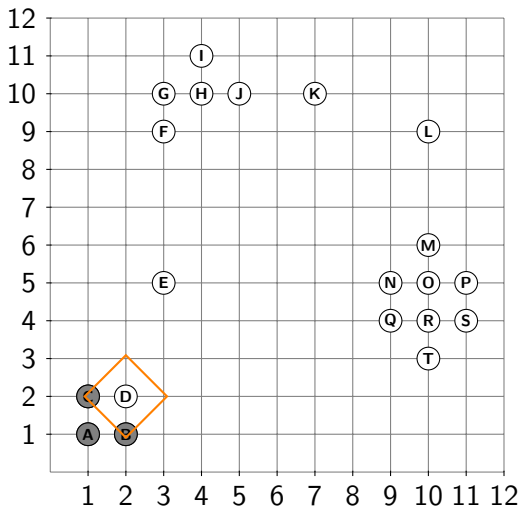


$$\epsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

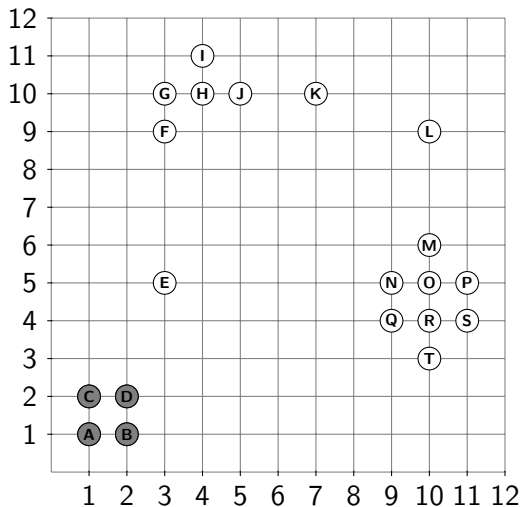


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

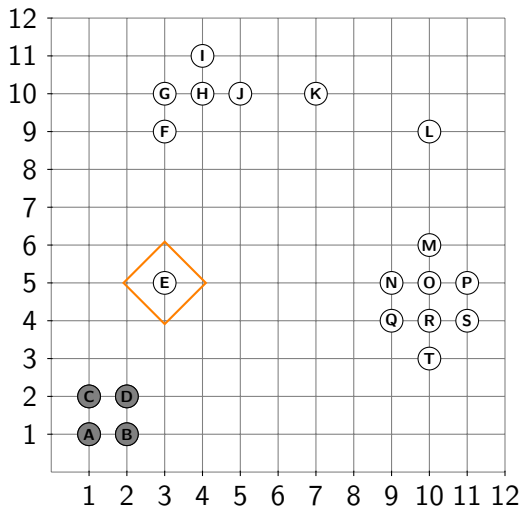


$$\epsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

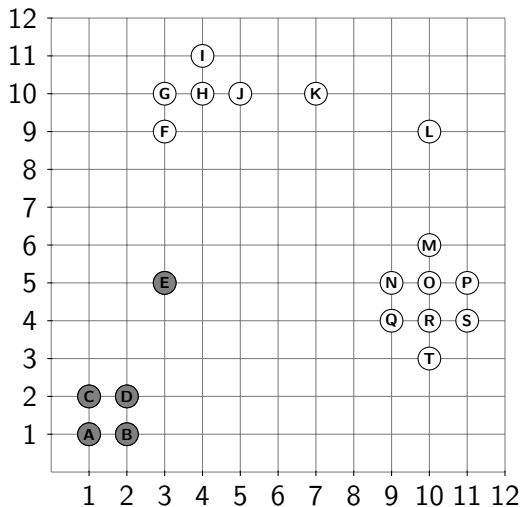


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

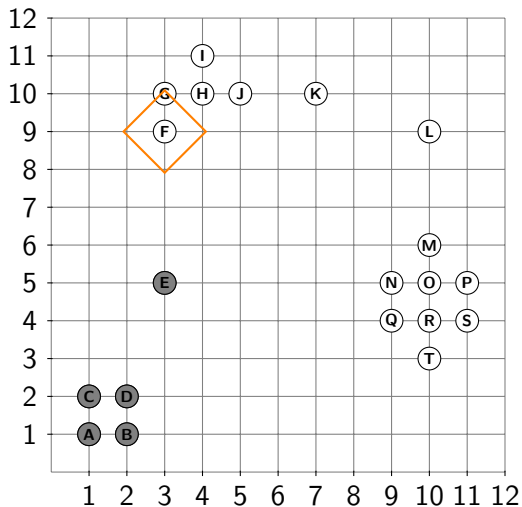


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

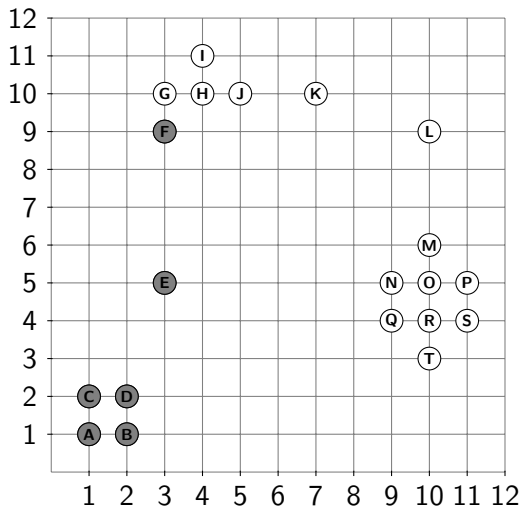


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

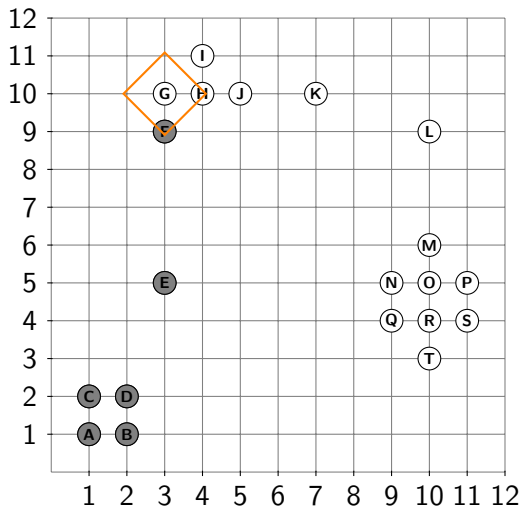


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

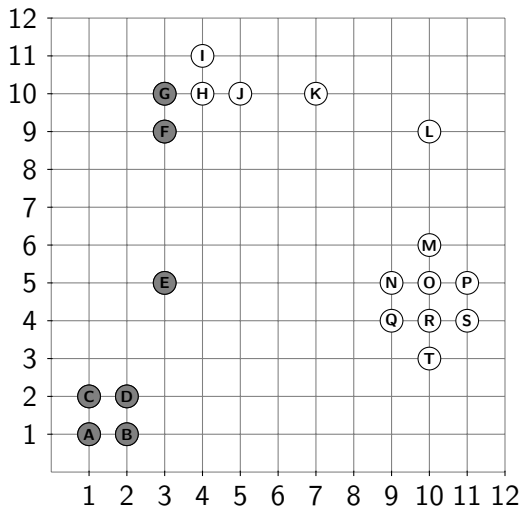


$$\epsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

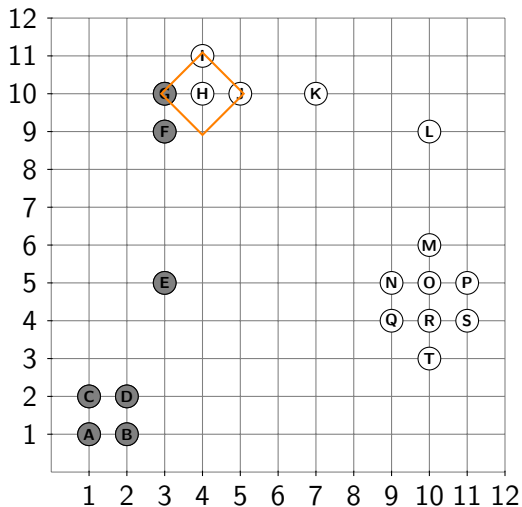


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

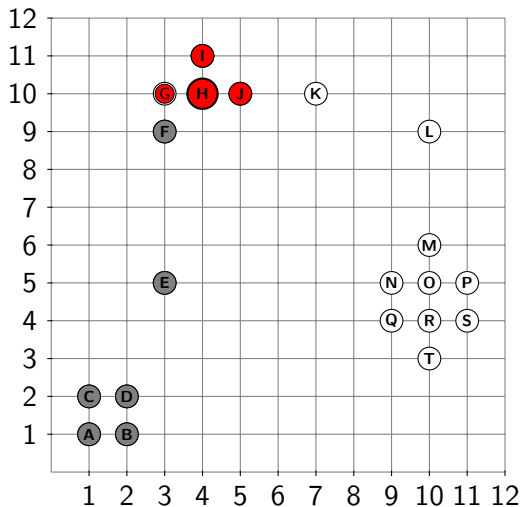


$$\epsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN



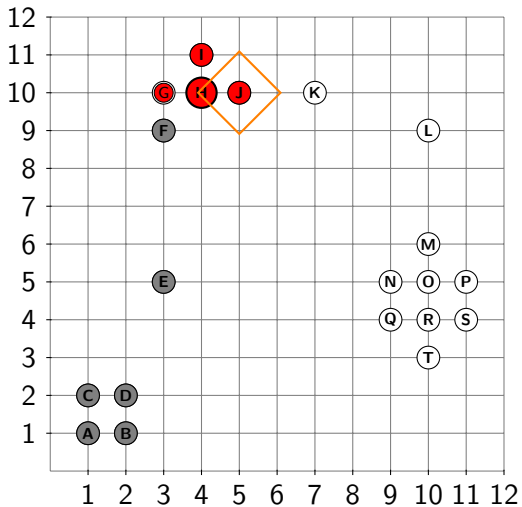
$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

IJ

DBSCAN



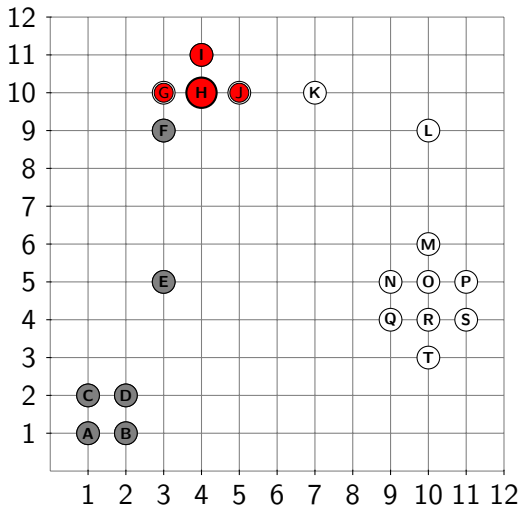
$$\varepsilon = 1.1$$

$$minPts = 4$$

Seed list:

1

DBSCAN



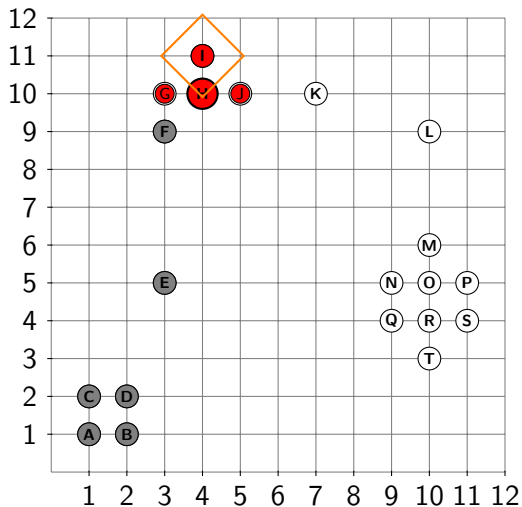
$$\varepsilon = 1.1$$

$$minPts = 4$$

Seed list:

1

DBSCAN

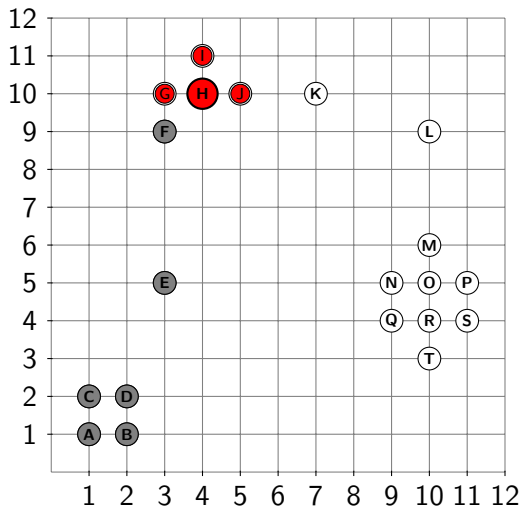


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

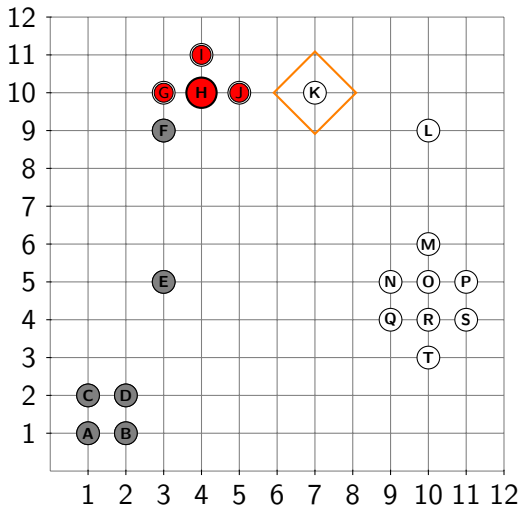


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

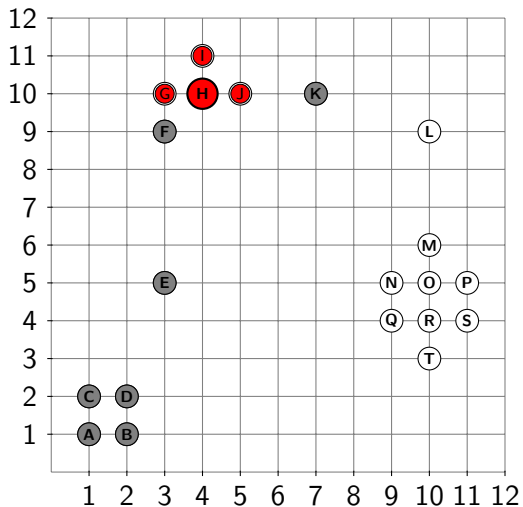
Seed list:

DBSCAN


$$\varepsilon = 1.1$$
$$minPts = 4$$

Seed list:

DBSCAN

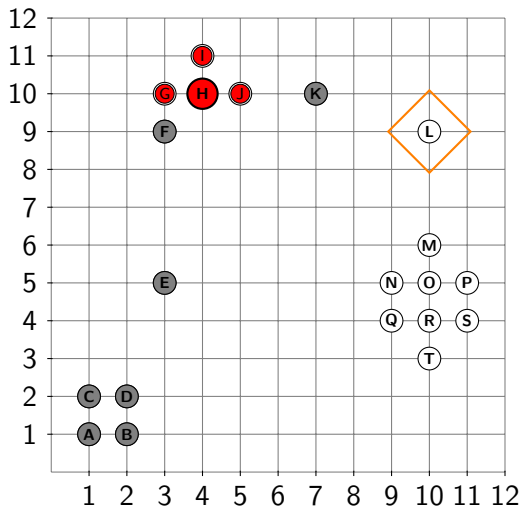


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

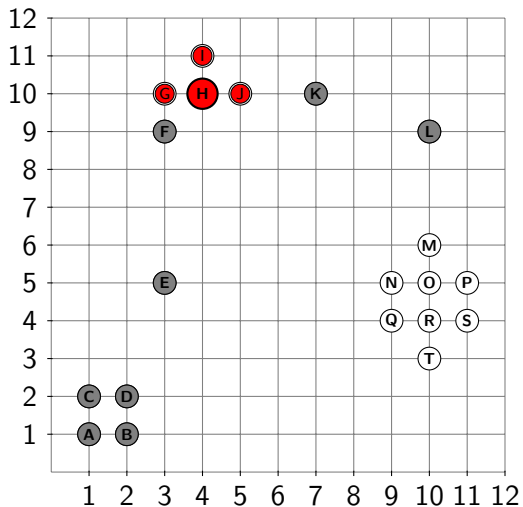


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

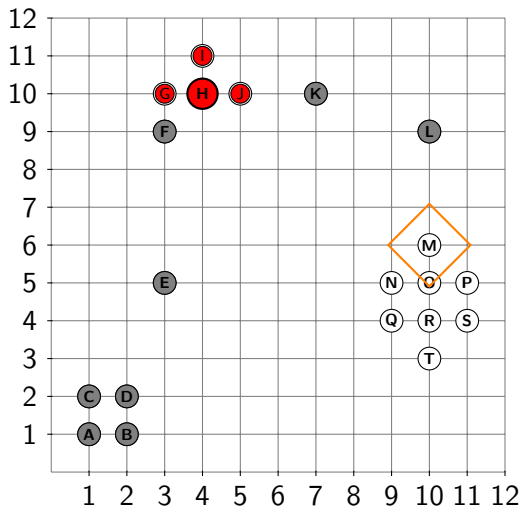


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

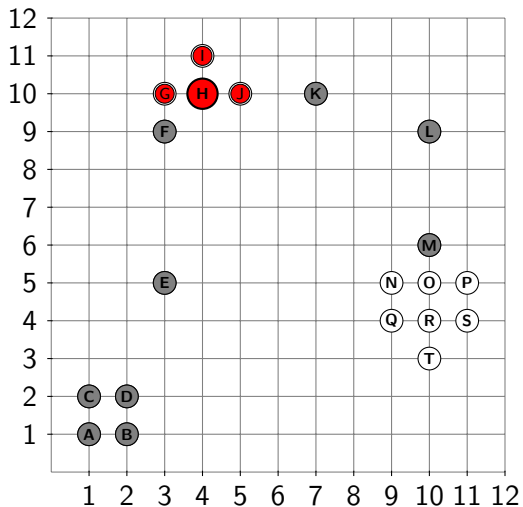


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

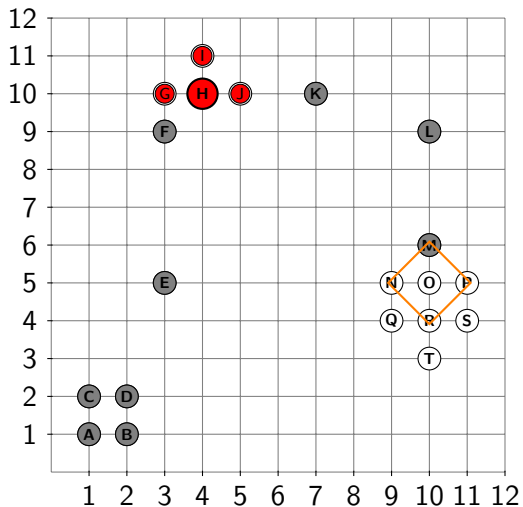


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

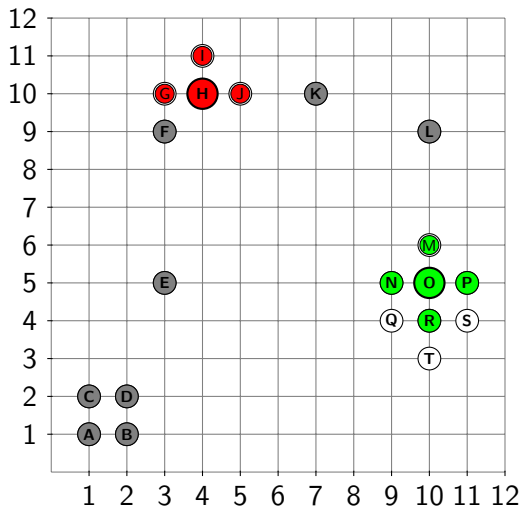


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN



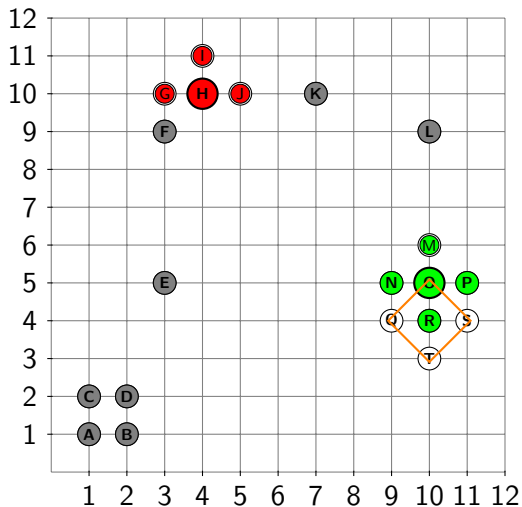
$$\epsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

NPR

DBSCAN



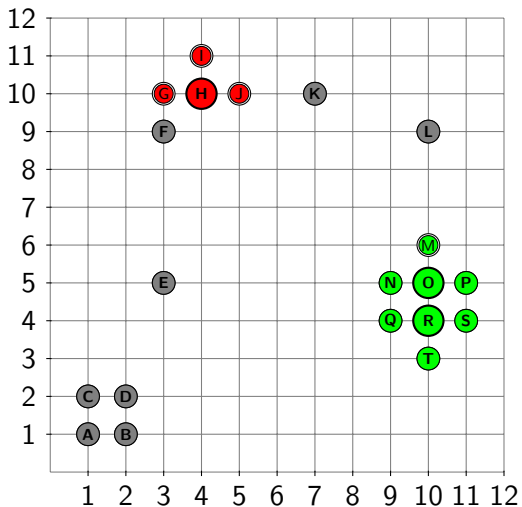
$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

NP

DBSCAN

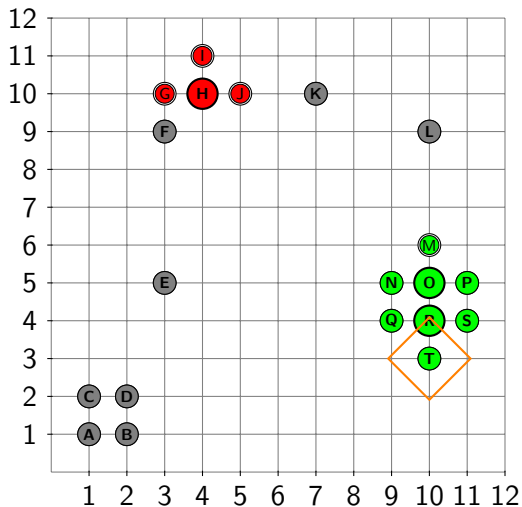


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:
NPQST

DBSCAN



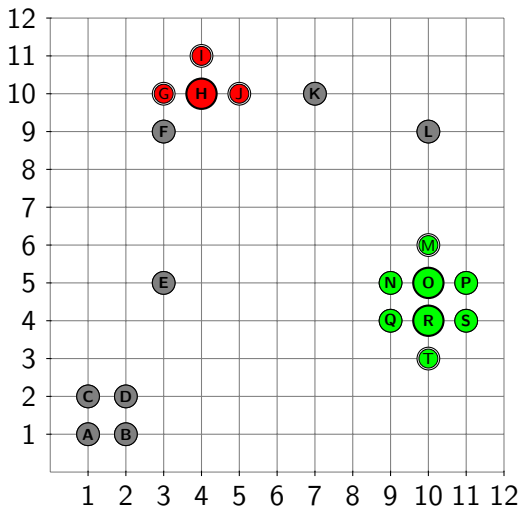
$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

NPQS

DBSCAN



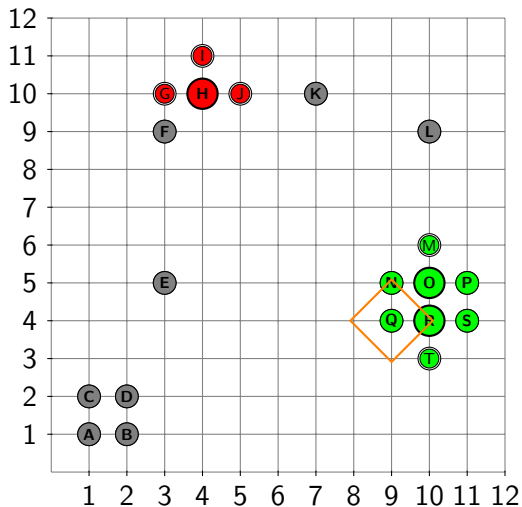
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$$\text{minPts} = 4$$

Seed list:

NPQS

DBSCAN



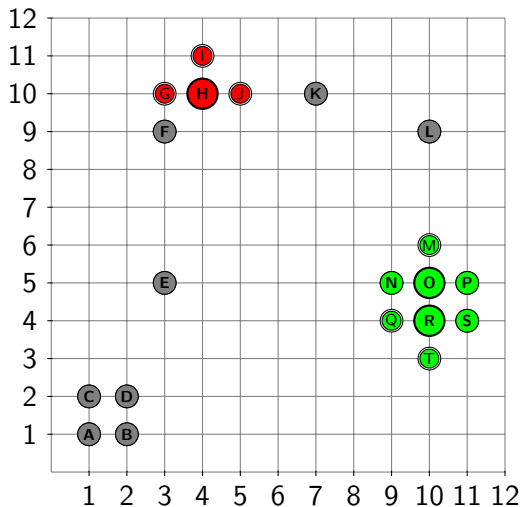
$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

NPS

DBSCAN



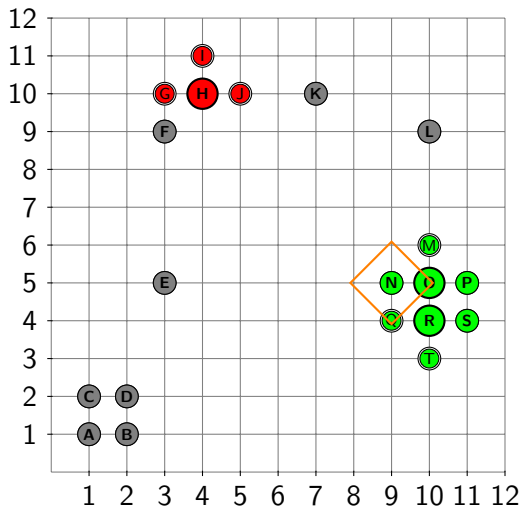
$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

NPS

DBSCAN



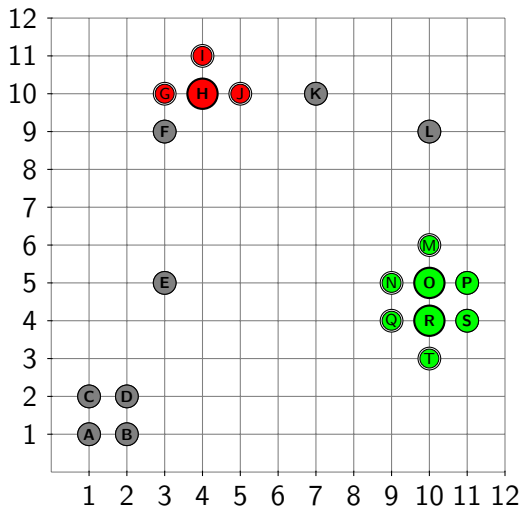
$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

PS

DBSCAN



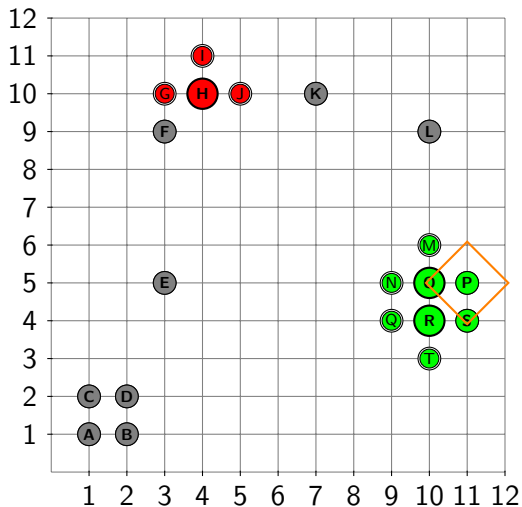
$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

PS

DBSCAN



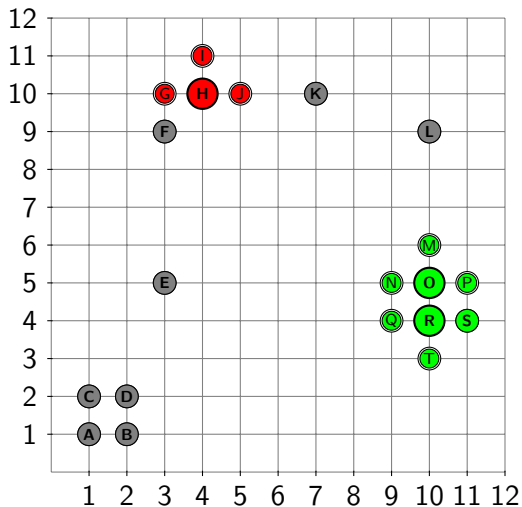
$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

S

DBSCAN



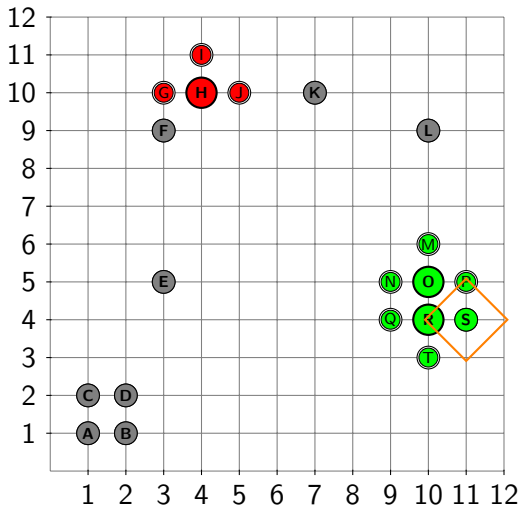
$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

S

DBSCAN

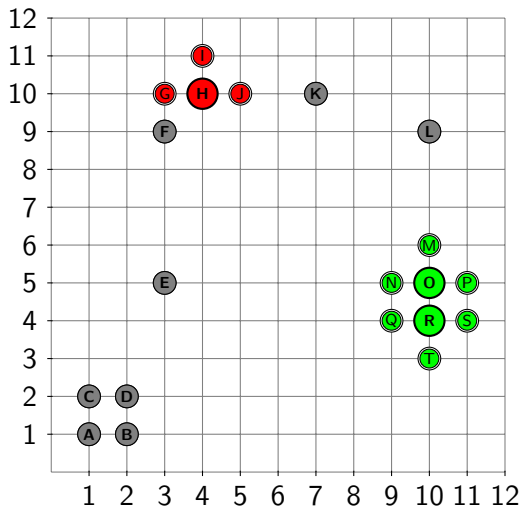


$$\varepsilon = 1.1$$

$$minPts = 4$$

Seed list:

DBSCAN

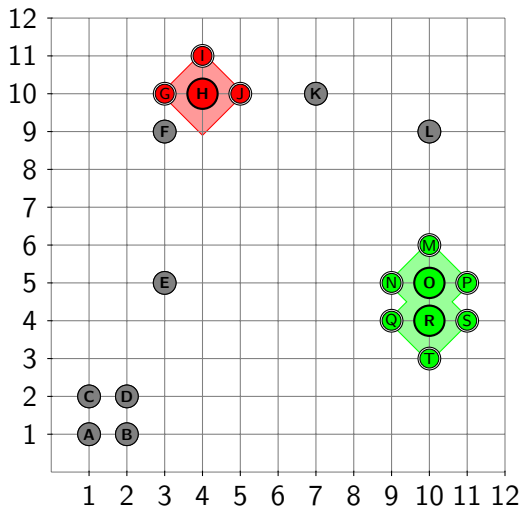


$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN



$$\varepsilon = 1.1$$

$$\text{minPts} = 4$$

Seed list:

Agenda

DBSCAN

$\varepsilon = 1.1$ minPts= 2

$\varepsilon = 1.1$ minPts= 3

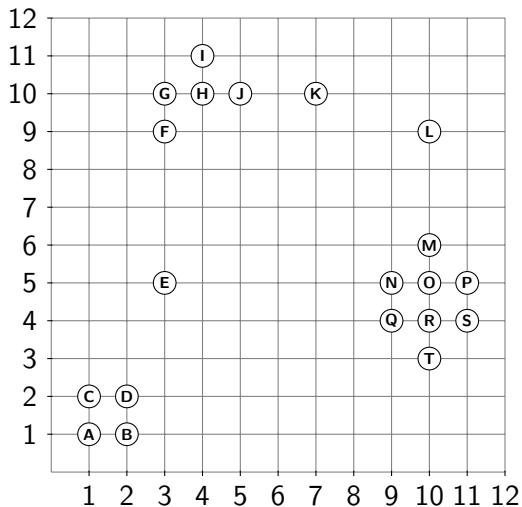
$\varepsilon = 1.1$ minPts= 4

$\varepsilon = 2.1$ minPts= 4

$\varepsilon = 4.1$ minPts= 5

$\varepsilon = 4.1$ minPts= 4

DBSCAN

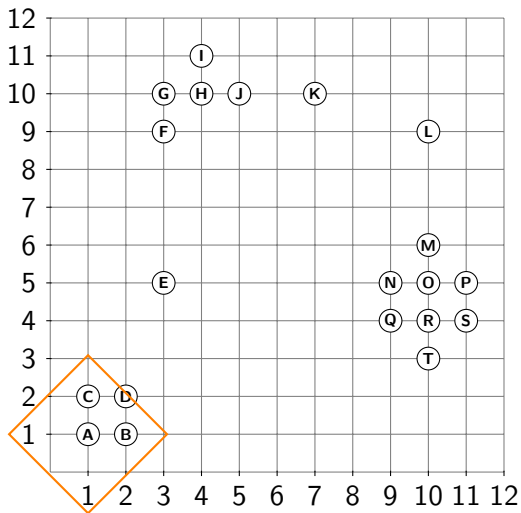


$$\varepsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

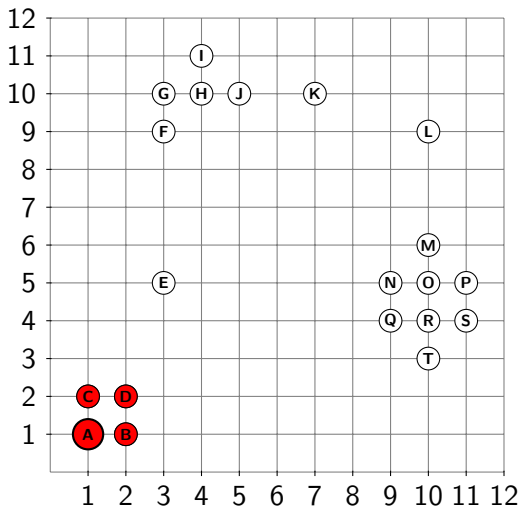


$$\epsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN



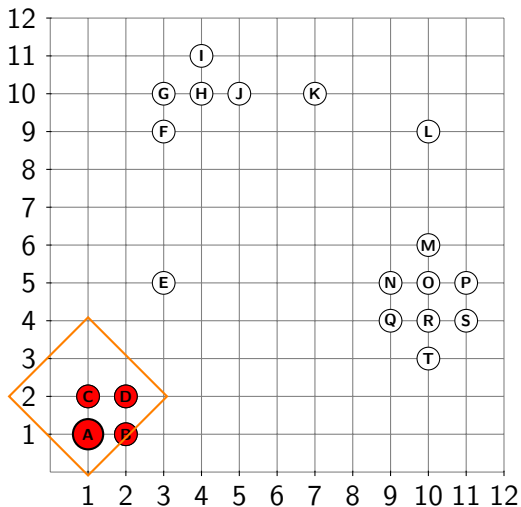
$$\varepsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

BCD

DBSCAN



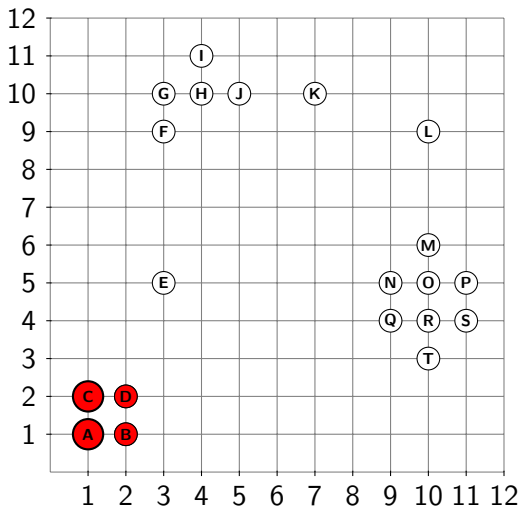
$$\varepsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

BD

DBSCAN



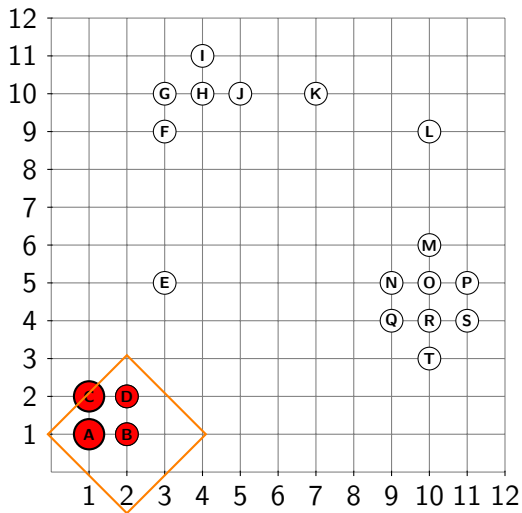
$$\varepsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

BD

DBSCAN



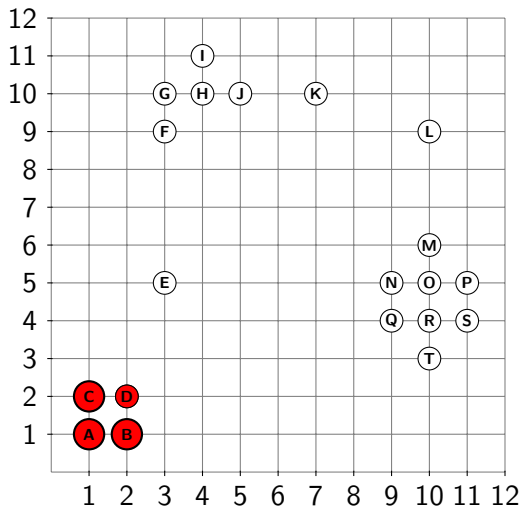
$$\epsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

D

DBSCAN



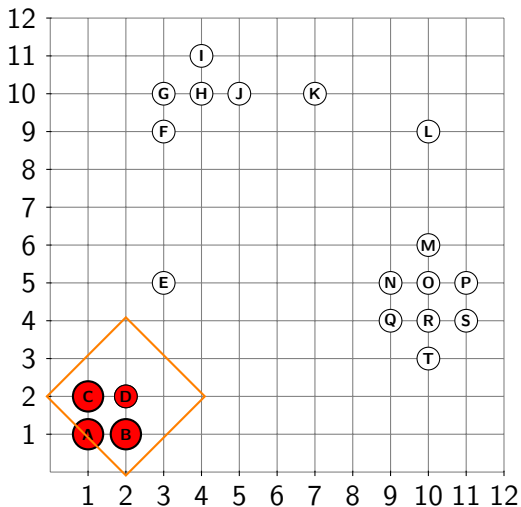
$$\epsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

D

DBSCAN

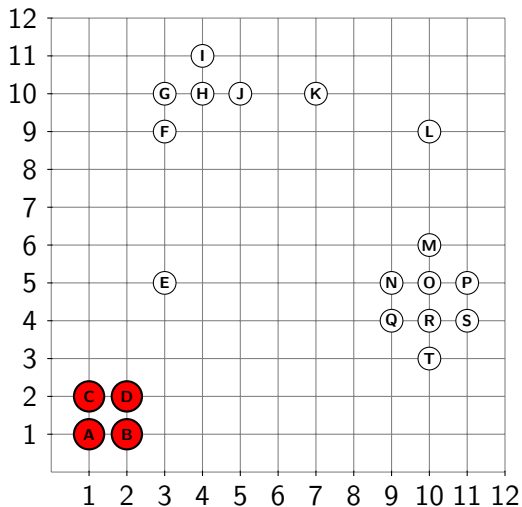


$$\varepsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

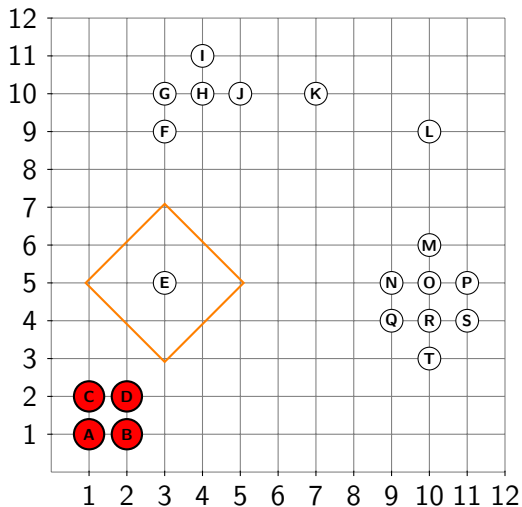


$$\epsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

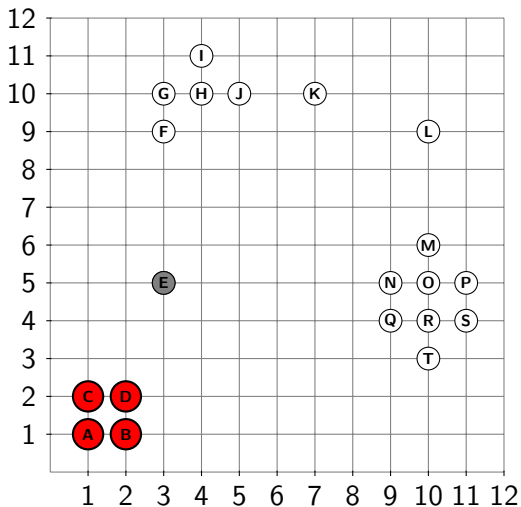


$$\epsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

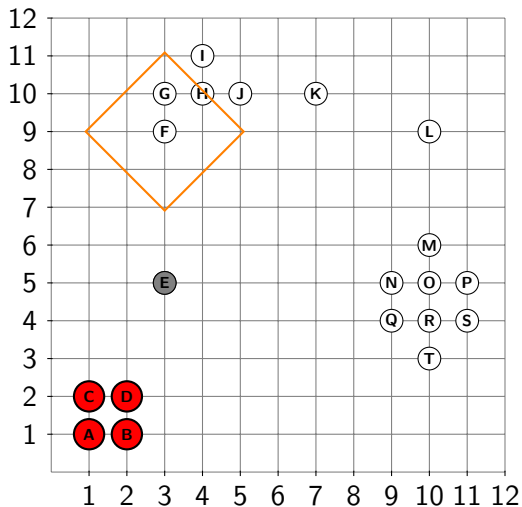


$$\varepsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

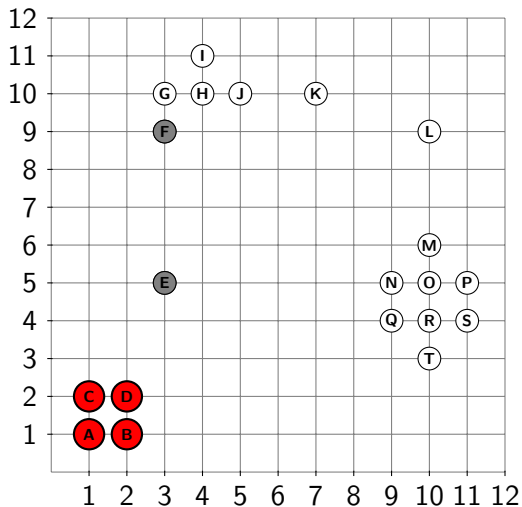


$$\epsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

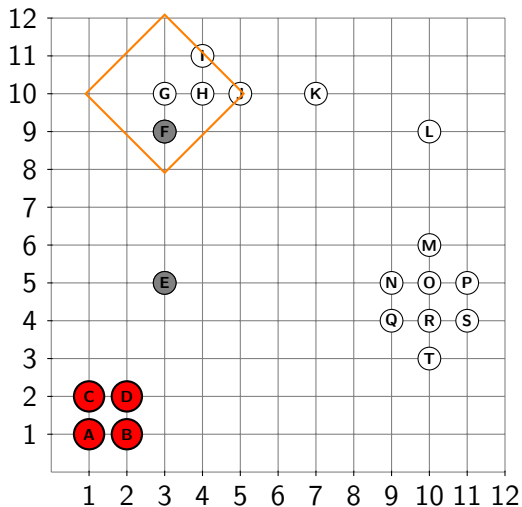


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$$\text{minPts} = 4$$

Seed list:

DBSCAN

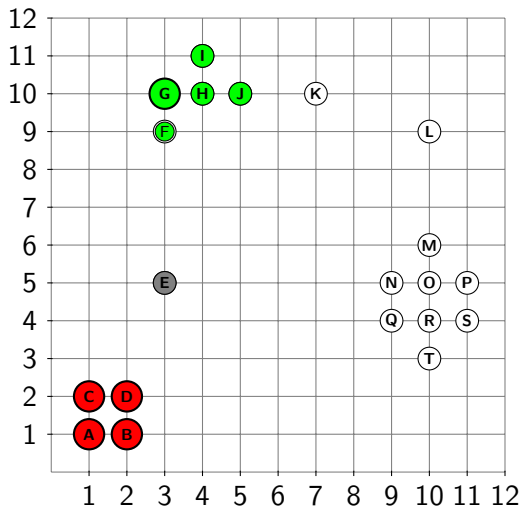


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$$\text{minPts} = 4$$

Seed list:

DBSCAN



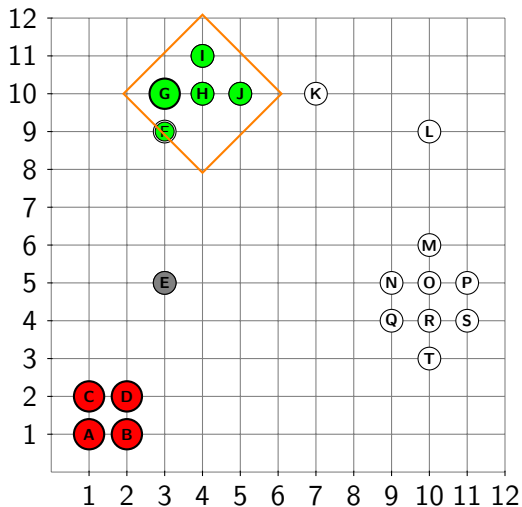
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$$\text{minPts} = 4$$

Seed list:

HIJ

DBSCAN



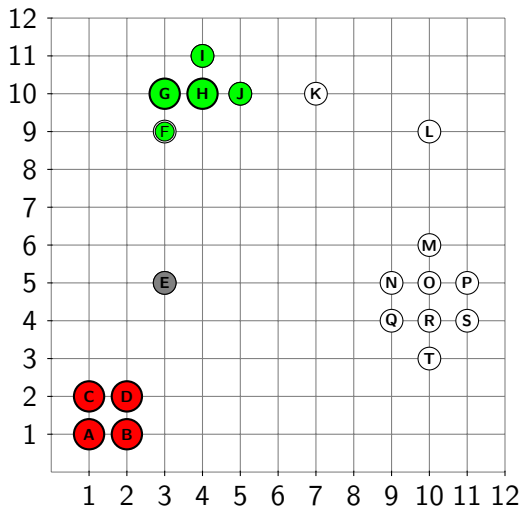
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$$\text{minPts} = 4$$

Seed list:

IJ

DBSCAN



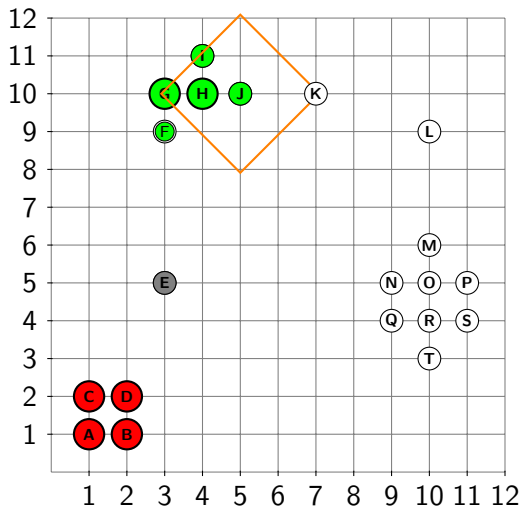
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$$\text{minPts} = 4$$

Seed list:

IJ

DBSCAN



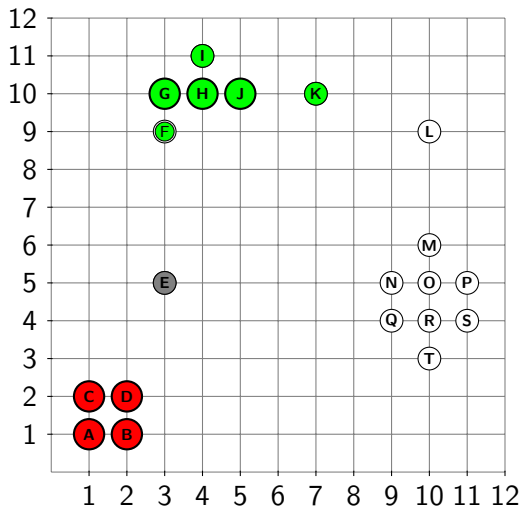
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$$\text{minPts} = 4$$

Seed list:

I

DBSCAN



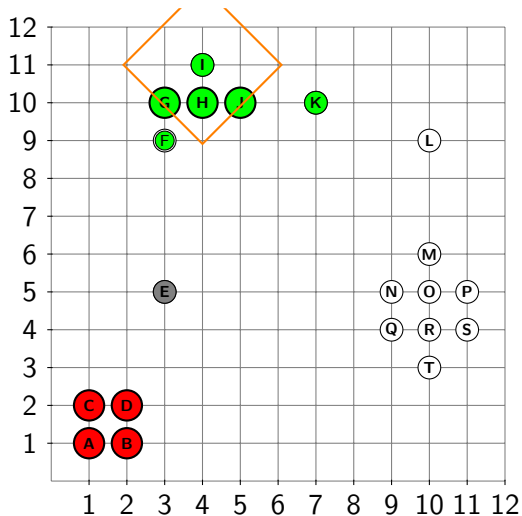
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$$\text{minPts} = 4$$

Seed list:

IK

DBSCAN



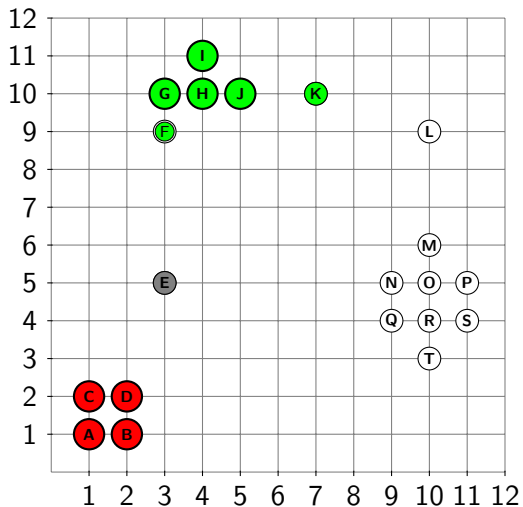
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$$\text{minPts} = 4$$

Seed list:

K

DBSCAN



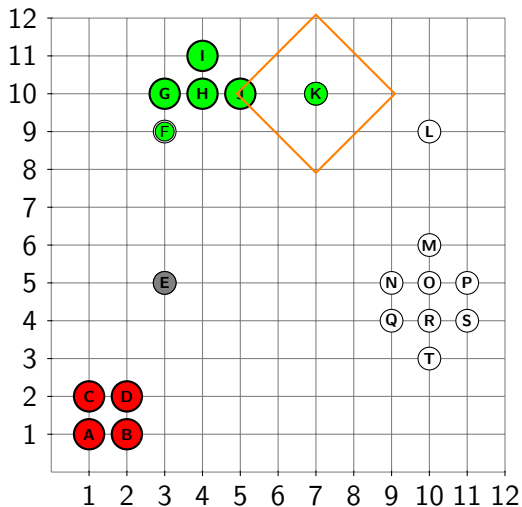
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$$\text{minPts} = 4$$

Seed list:

K

DBSCAN

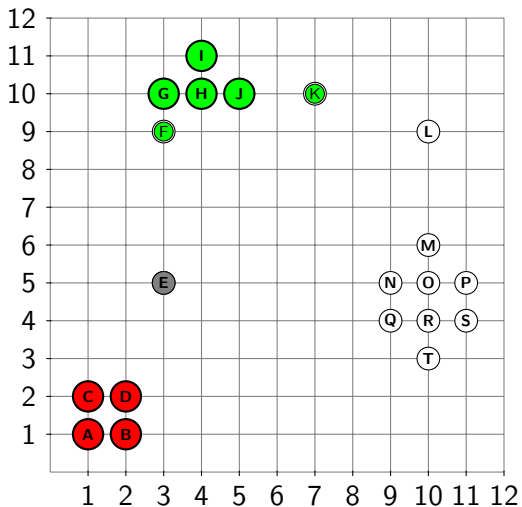


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$$\text{minPts} = 4$$

Seed list:

DBSCAN

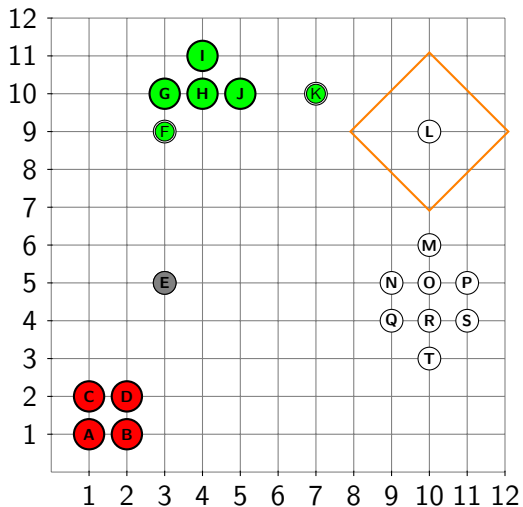


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Seed list:

DBSCAN

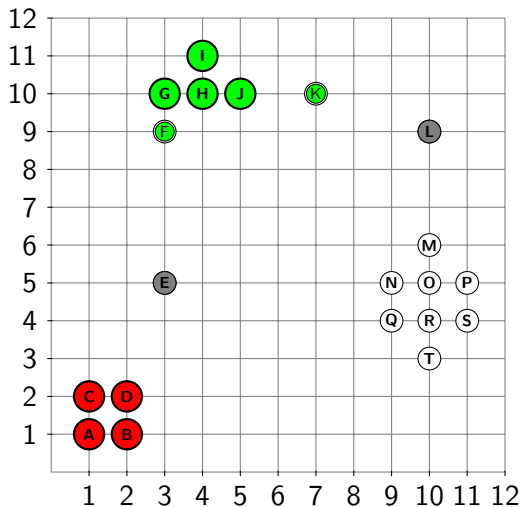


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Seed list:

DBSCAN

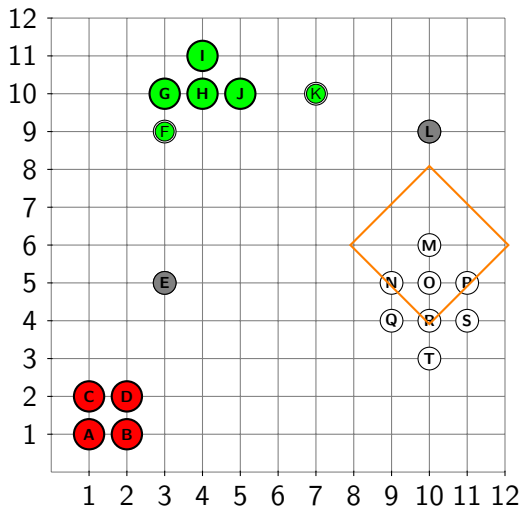


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Seed list:

DBSCAN

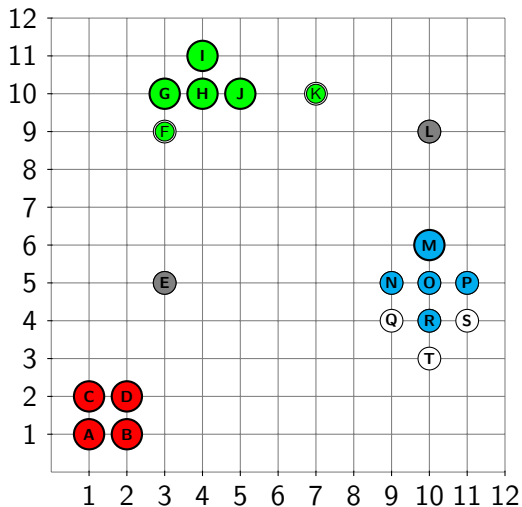


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Seed list:

DBSCAN



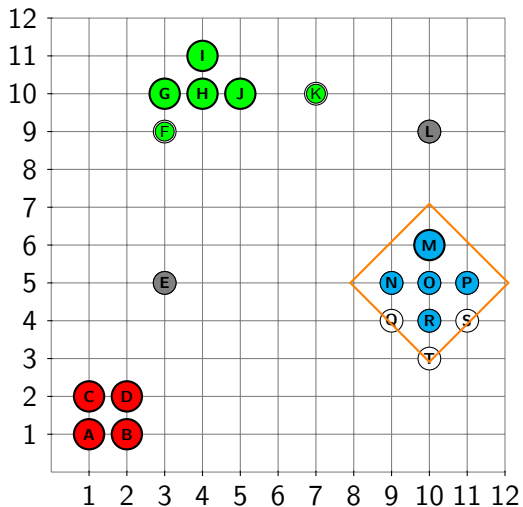
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Seed list:

ONPR

DBSCAN



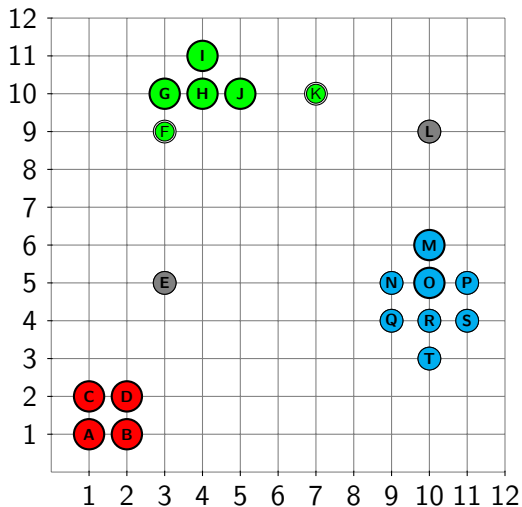
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Seed list:

NPR

DBSCAN

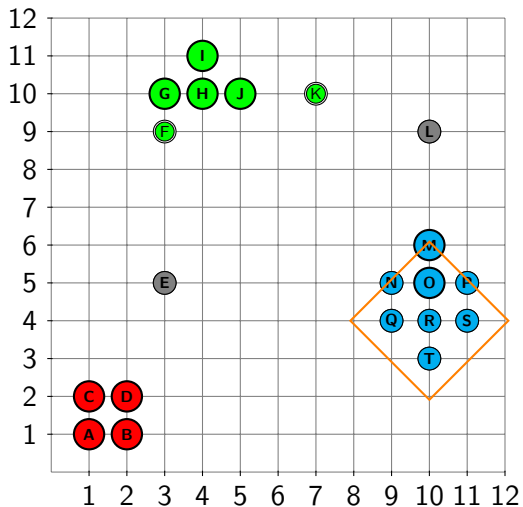


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Seed list:
NPRQST

DBSCAN

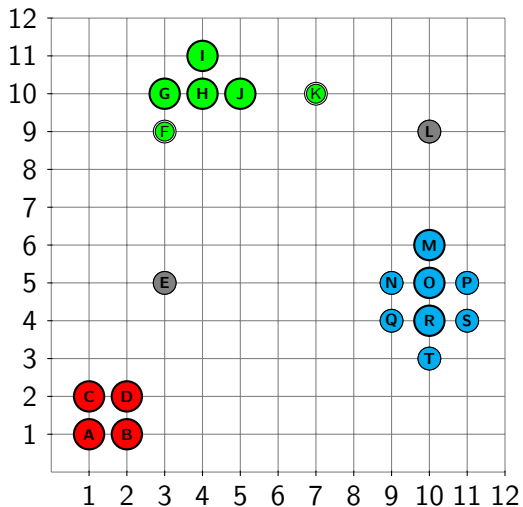


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$$\text{minPts} = 4$$

Seed list:
NPQST

DBSCAN

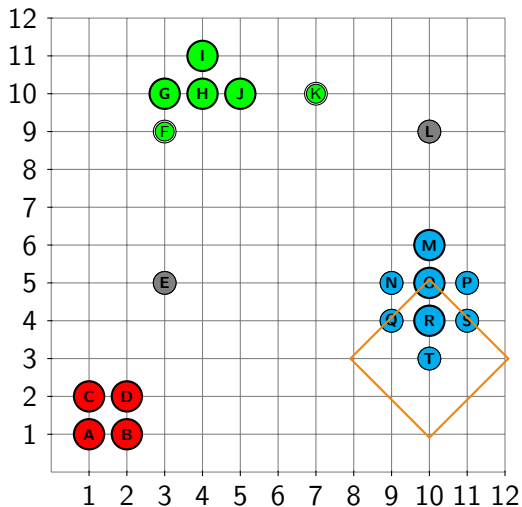


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$$\text{minPts} = 4$$

Seed list:
NPQST

DBSCAN



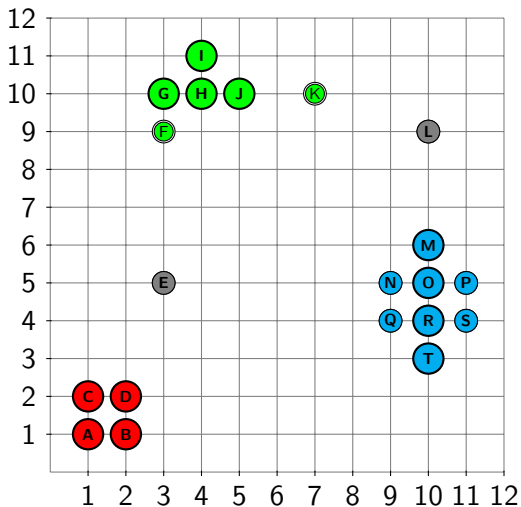
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$$\text{minPts} = 4$$

Seed list:

NPQS

DBSCAN



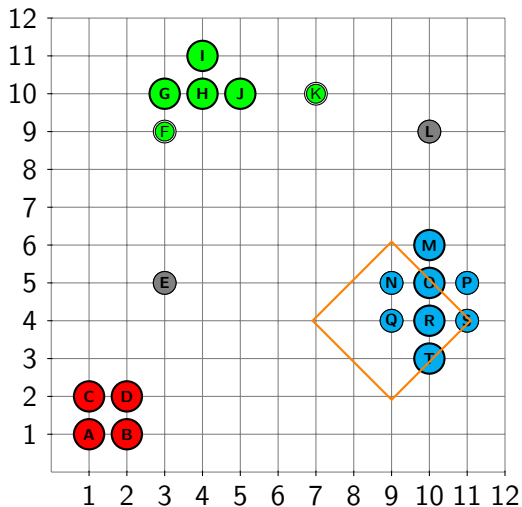
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$$\text{minPts} = 4$$

Seed list:

NPQS

DBSCAN



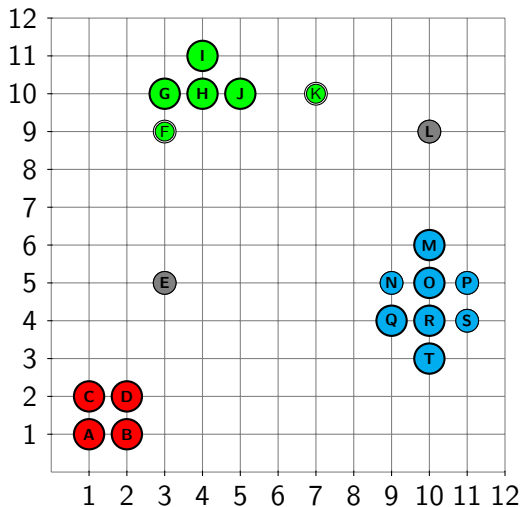
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$$\text{minPts} = 4$$

Seed list:

NPS

DBSCAN



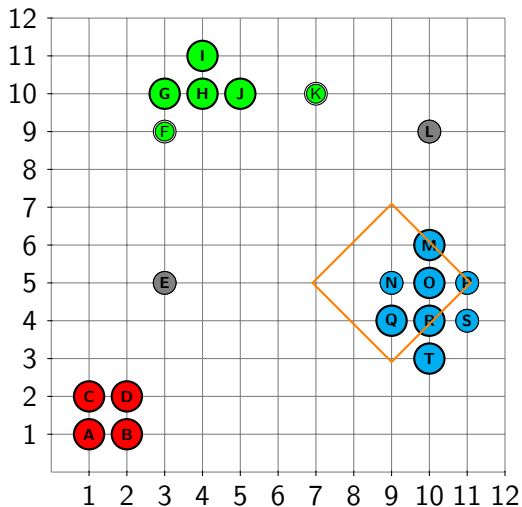
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$$\text{minPts} = 4$$

Seed list:

NPS

DBSCAN



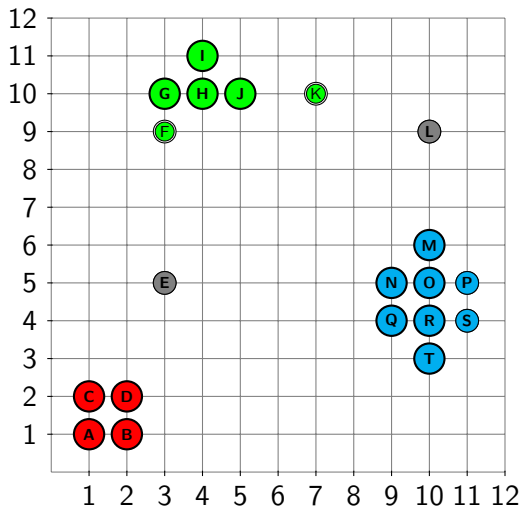
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$$\text{minPts} = 4$$

Seed list:

PS

DBSCAN



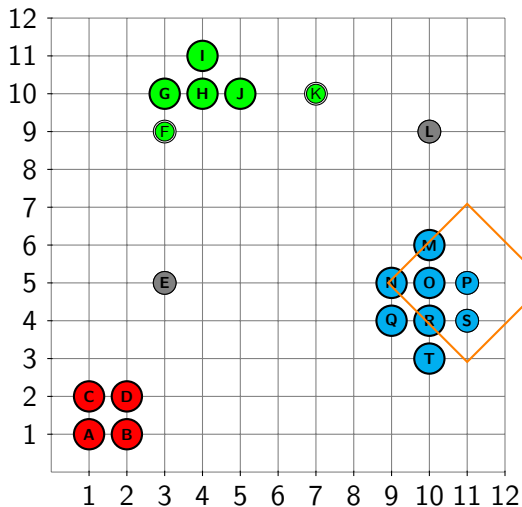
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$$\text{minPts} = 4$$

Seed list:

PS

DBSCAN



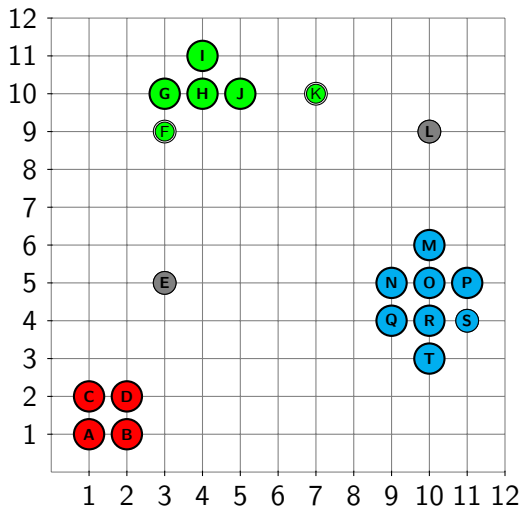
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$$\text{minPts} = 4$$

Seed list:

S

DBSCAN



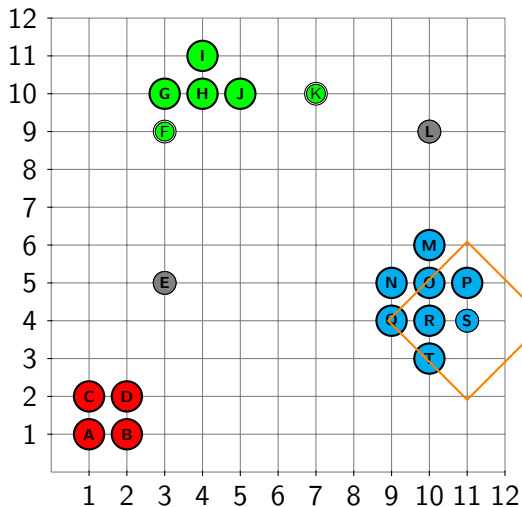
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$$\text{minPts} = 4$$

Seed list:

S

DBSCAN

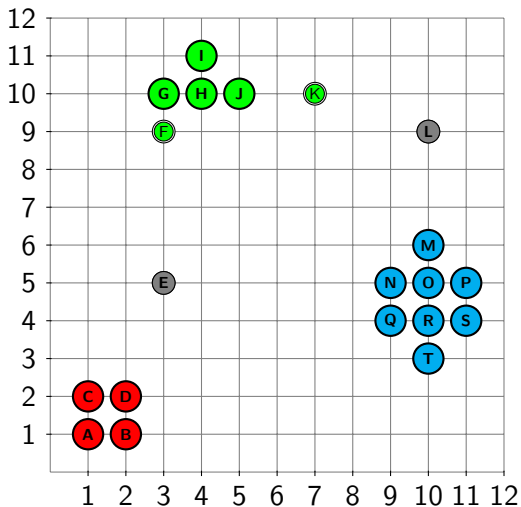


$$\varepsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

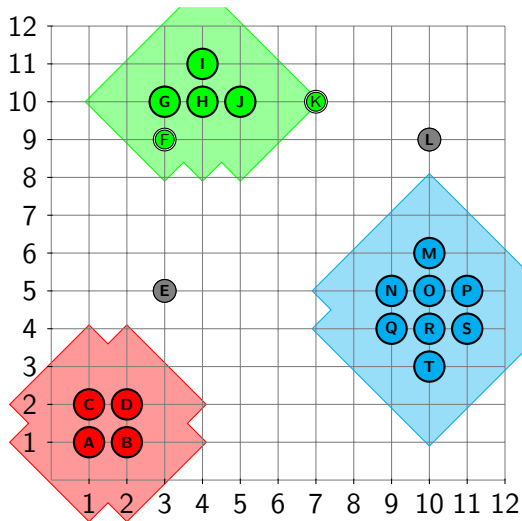


$$\varepsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN



$$\varepsilon = 2.1$$

$$\text{minPts} = 4$$

Seed list:

Agenda

DBSCAN

$\varepsilon = 1.1$ minPts= 2

$\varepsilon = 1.1$ minPts= 3

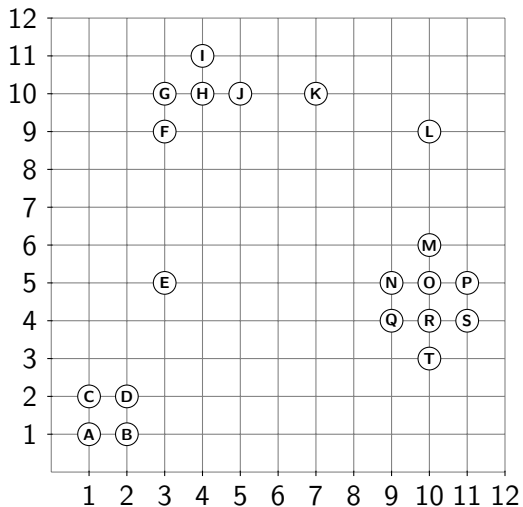
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$\varepsilon = 2.1$ minPts= 4

$\varepsilon = 4.1$ minPts= 5

$\varepsilon = 4.1$ minPts= 4

DBSCAN

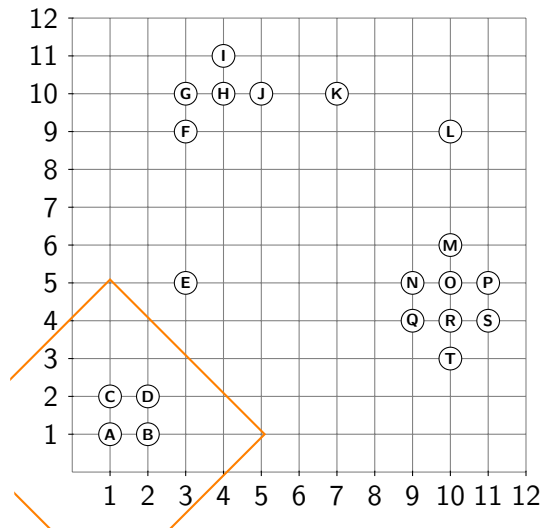


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$$\text{minPts} = 5$$

Seed list:

DBSCAN

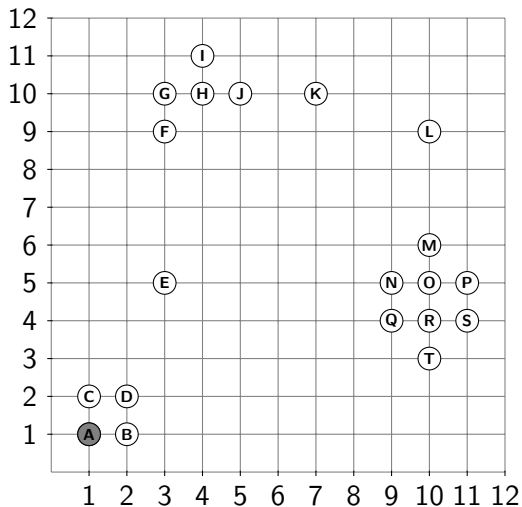


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$$\text{minPts} = 5$$

Seed list:

DBSCAN

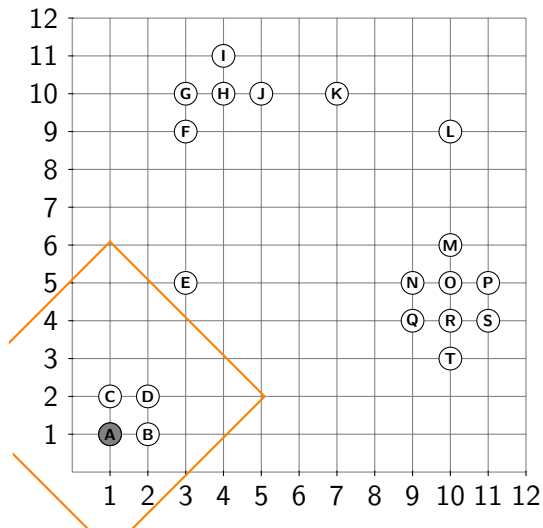


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$$\text{minPts} = 5$$

Seed list:

DBSCAN

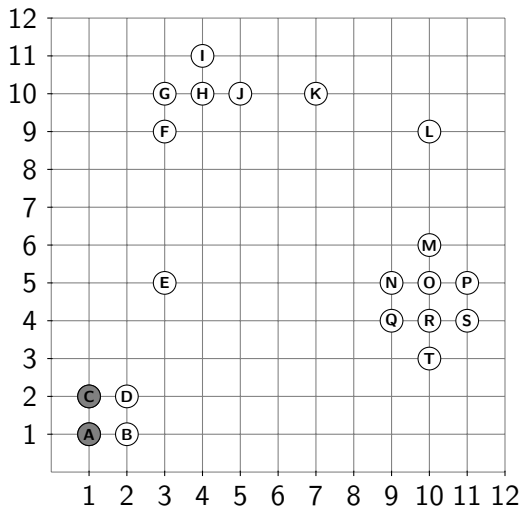


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$$\text{minPts} = 5$$

Seed list:

DBSCAN

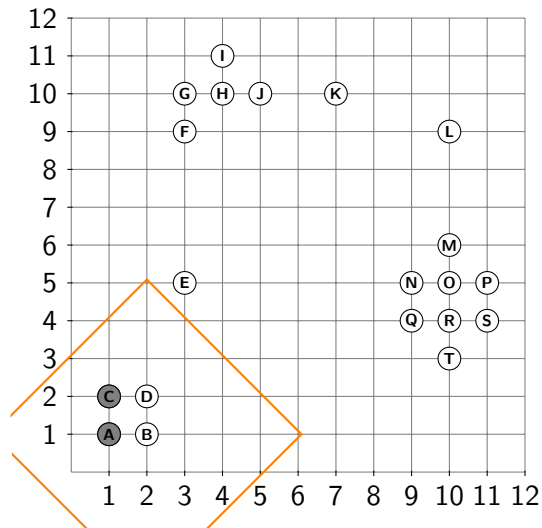


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$$\text{minPts} = 5$$

Seed list:

DBSCAN

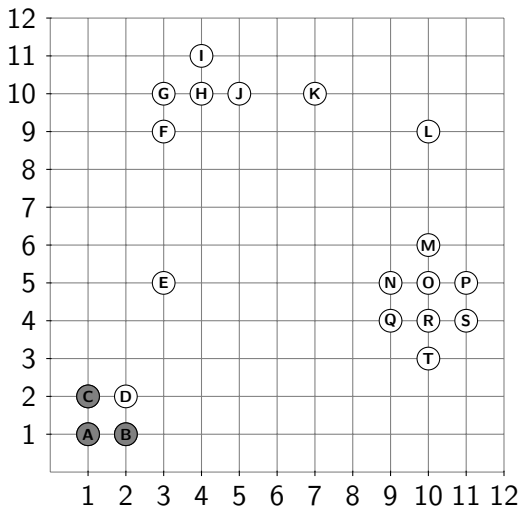


$$\epsilon = 4.1$$

$$\text{minPts} = 5$$

Seed list:

DBSCAN

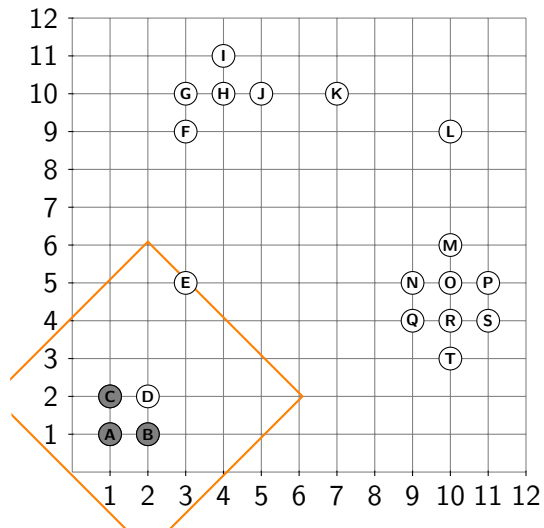


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$$\text{minPts} = 5$$

Seed list:

DBSCAN

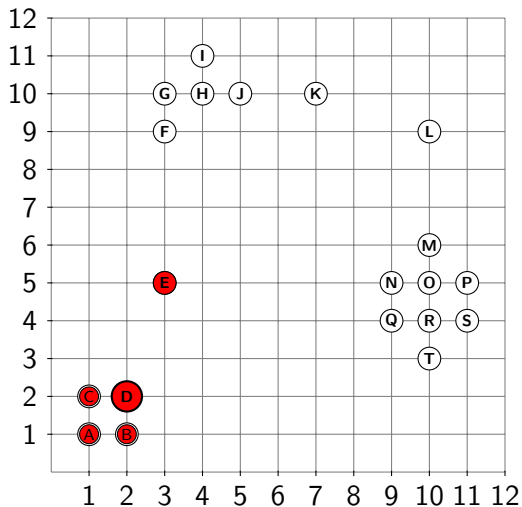


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$$\text{minPts} = 5$$

Seed list:

DBSCAN



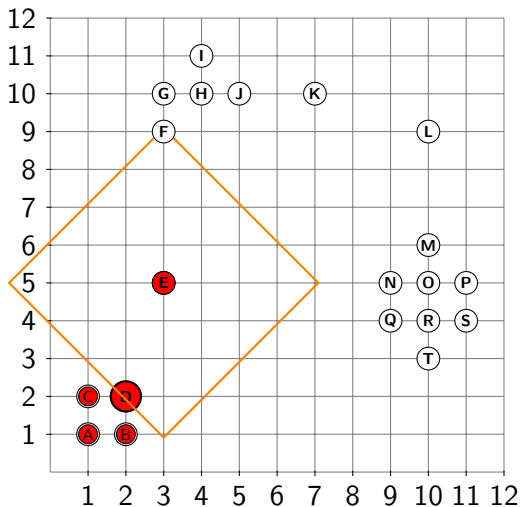
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$$\text{minPts} = 5$$

Seed list:

E

DBSCAN

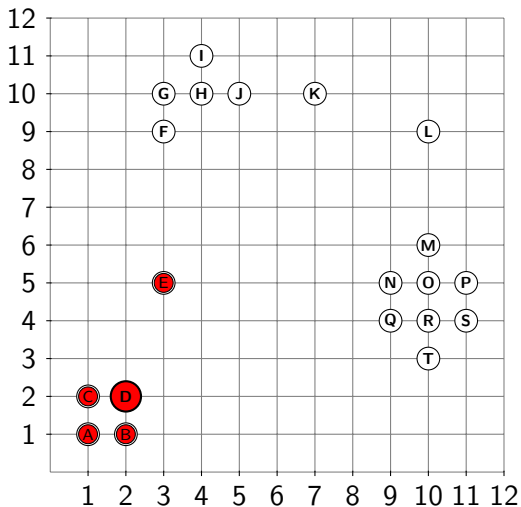


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$$\text{minPts} = 5$$

Seed list:

DBSCAN

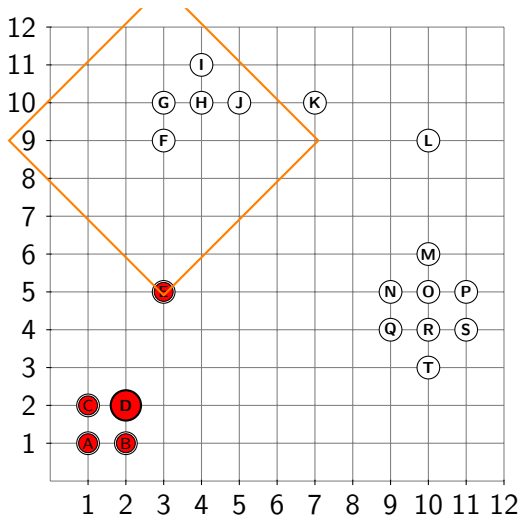


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Seed list:

DBSCAN

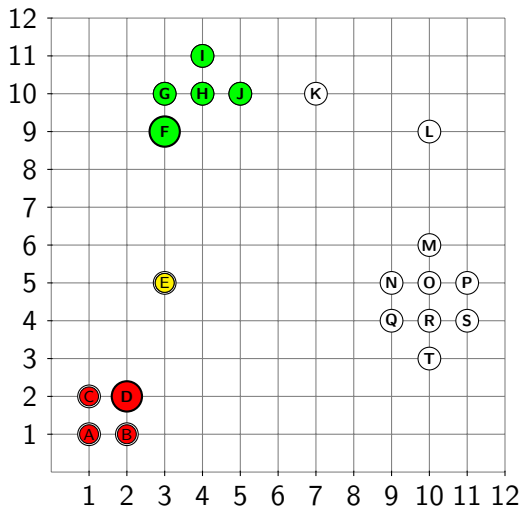


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Seed list:

DBSCAN



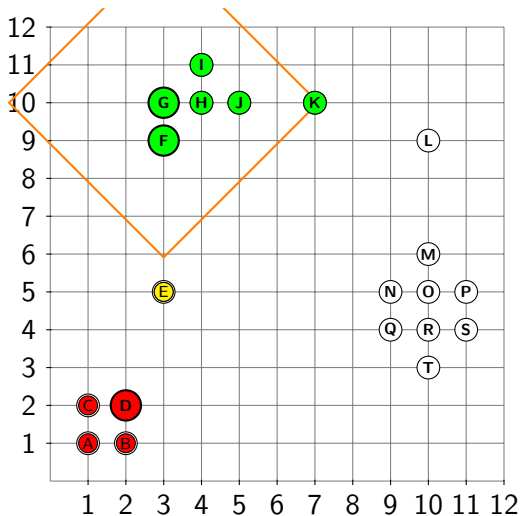
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$$\text{minPts} = 5$$

Seed list:

GHIJ

DBSCAN



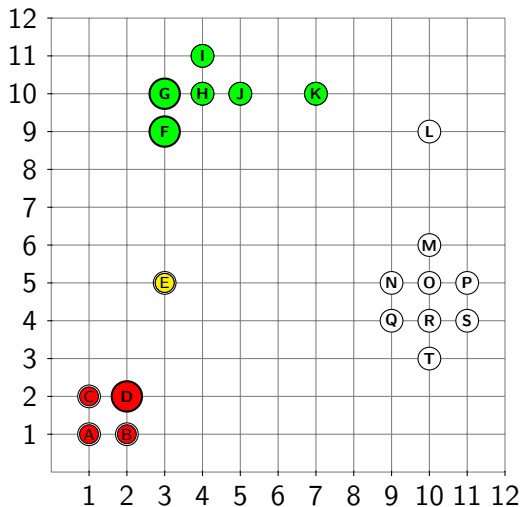
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$$\text{minPts} = 5$$

Seed list:

HIJ

DBSCAN



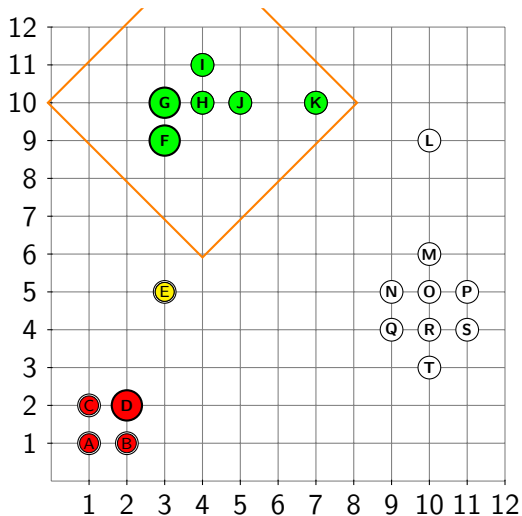
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$$\text{minPts} = 5$$

Seed list:

HIJK

DBSCAN



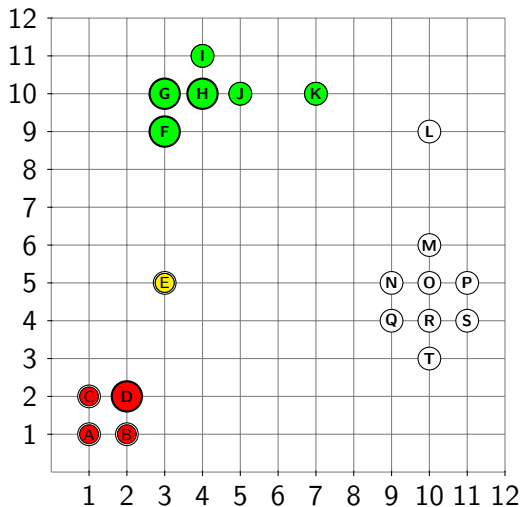
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$$\text{minPts} = 5$$

Seed list:

IJK

DBSCAN



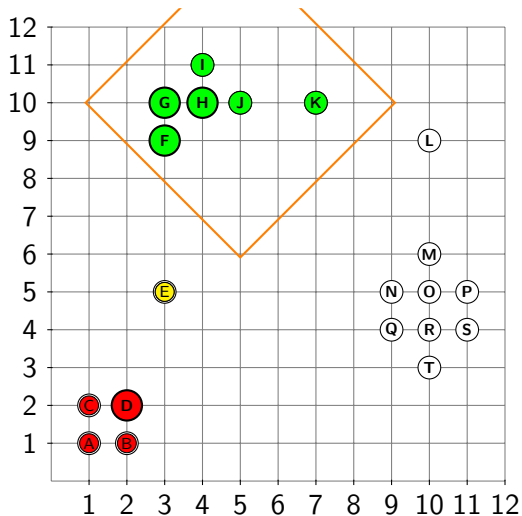
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$$\text{minPts} = 5$$

Seed list:

IJK

DBSCAN



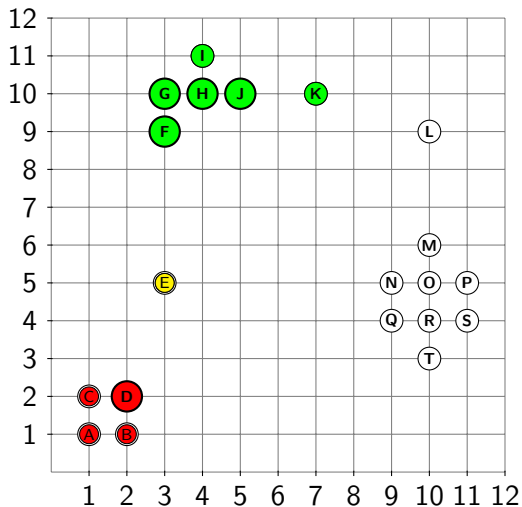
$$\varepsilon = 4.1$$

$$\text{minPts} = 5$$

Seed list:

IK

DBSCAN



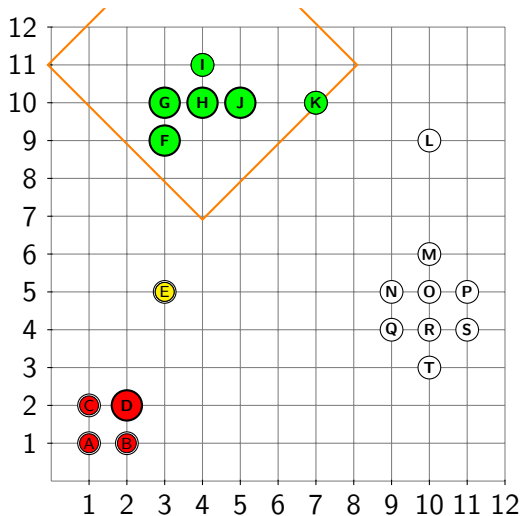
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$$\text{minPts} = 5$$

Seed list:

IK

DBSCAN



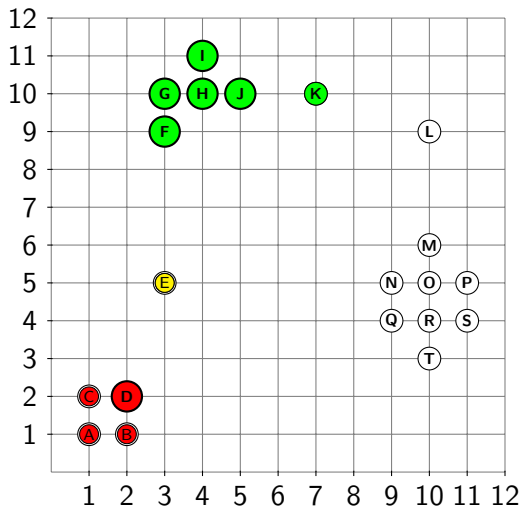
$$\varepsilon = 4.1$$

$$\text{minPts} = 5$$

Seed list:

K

DBSCAN



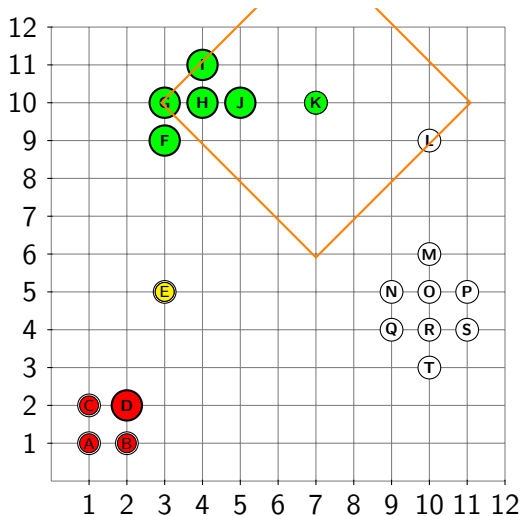
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$$\text{minPts} = 5$$

Seed list:

K

DBSCAN

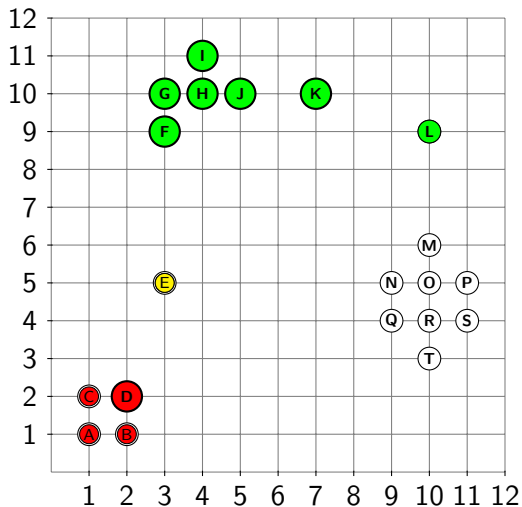


$$\varepsilon = 4.1$$

$$\text{minPts} = 5$$

Seed list:

DBSCAN



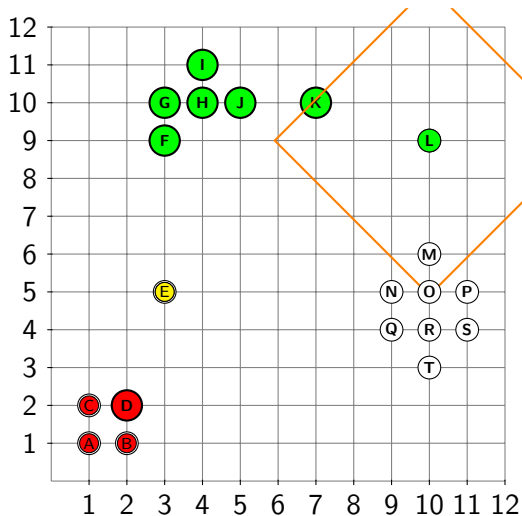
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$$\text{minPts} = 5$$

Seed list:

L

DBSCAN

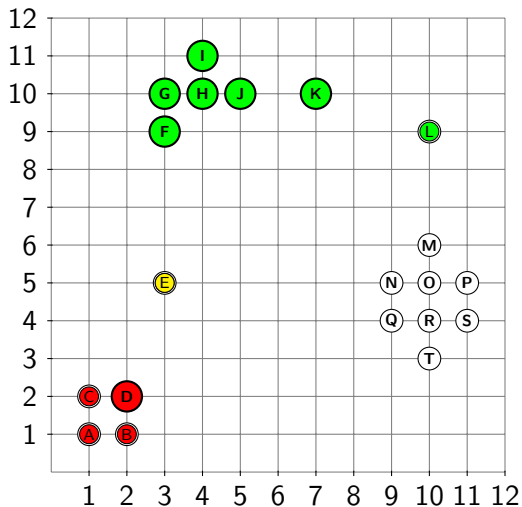


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$$\text{minPts} = 5$$

Seed list:

DBSCAN

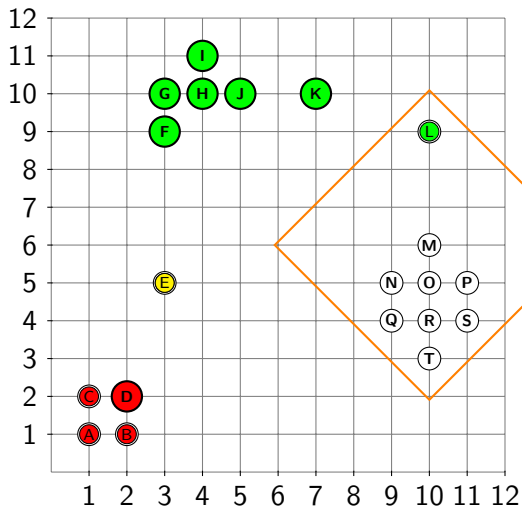


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Seed list:

DBSCAN

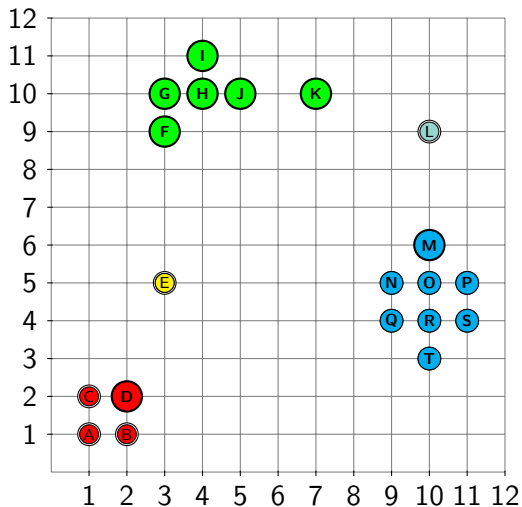


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Seed list:

DBSCAN



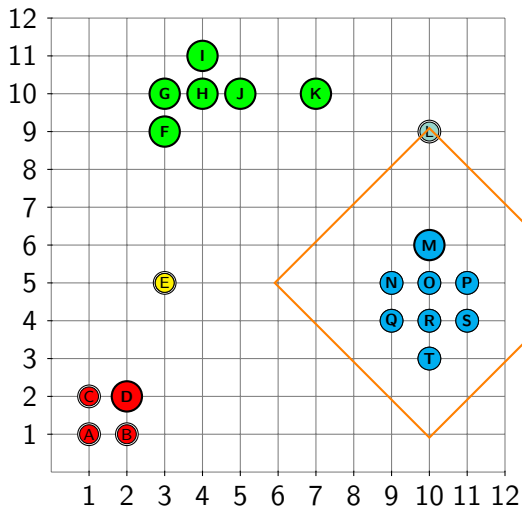
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Seed list:

ONPRQST

DBSCAN

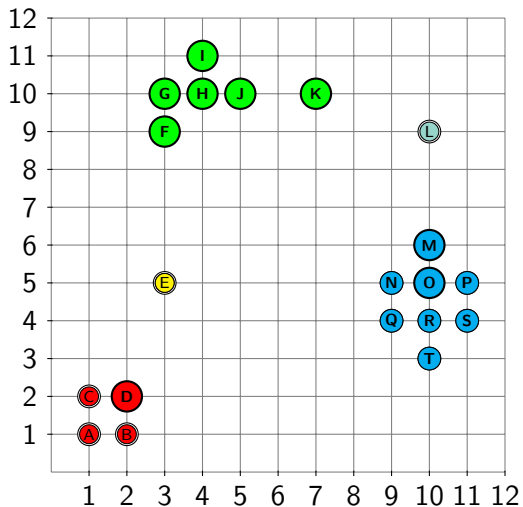


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$$\text{minPts} = 5$$

Seed list:
NPQST

DBSCAN

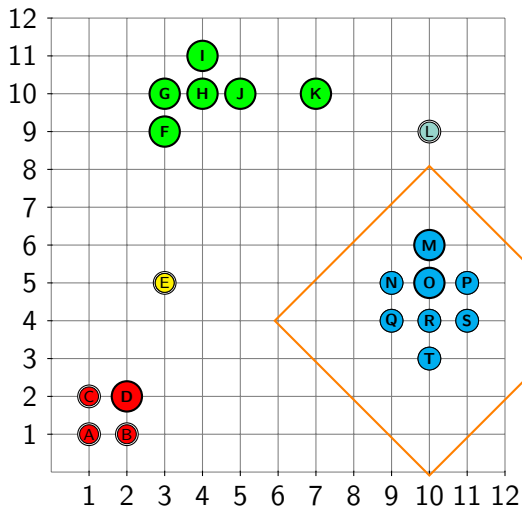


$$\epsilon = 4.1$$

$$\text{minPts} = 5$$

Seed list:
NPQST

DBSCAN

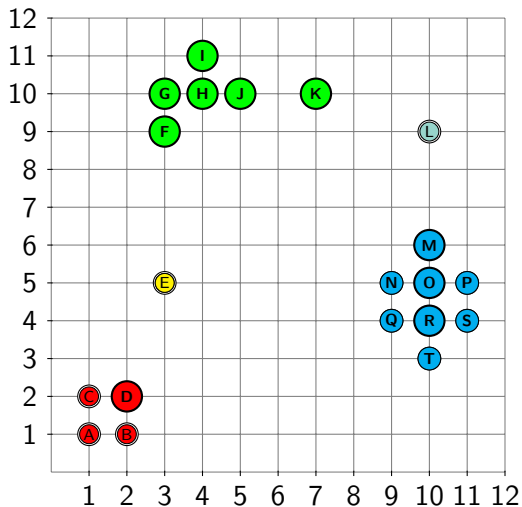


$$\varepsilon = 4.1$$

$$\text{minPts} = 5$$

Seed list:
NPQST

DBSCAN

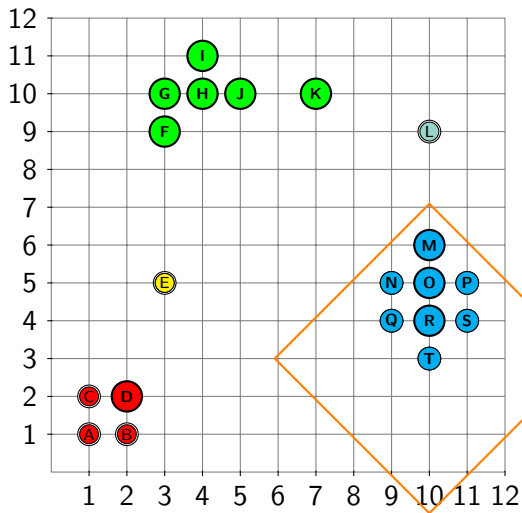


$$\epsilon = 4.1$$

$$\text{minPts} = 5$$

Seed list:
NPQST

DBSCAN



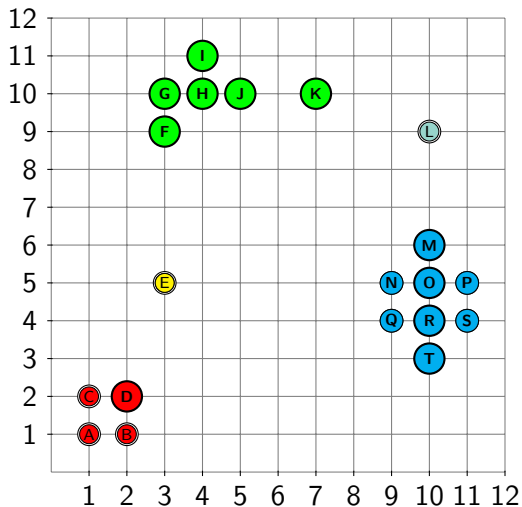
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$$\text{minPts} = 5$$

Seed list:

NPQS

DBSCAN



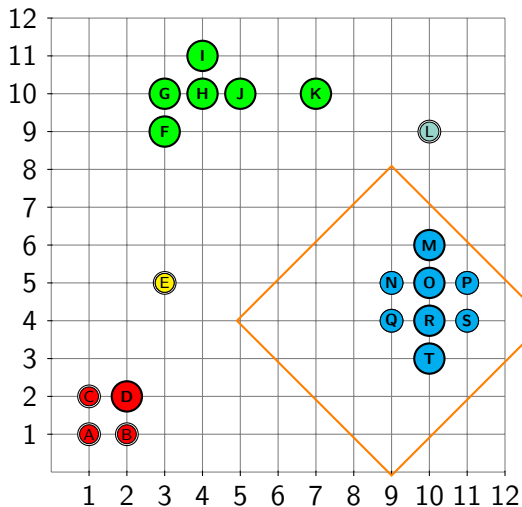
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$$\text{minPts} = 5$$

Seed list:

NPQS

DBSCAN



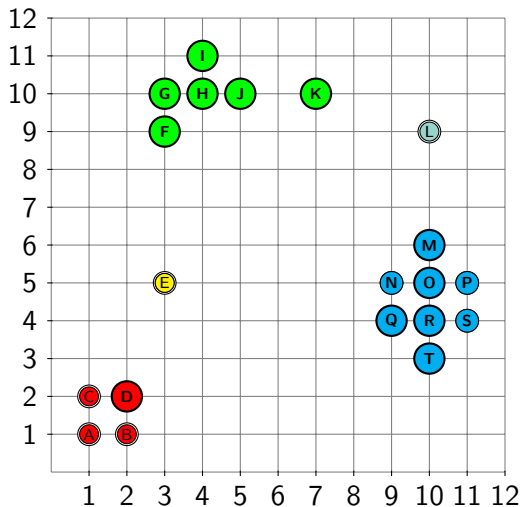
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$$\text{minPts} = 5$$

Seed list:

NPS

DBSCAN



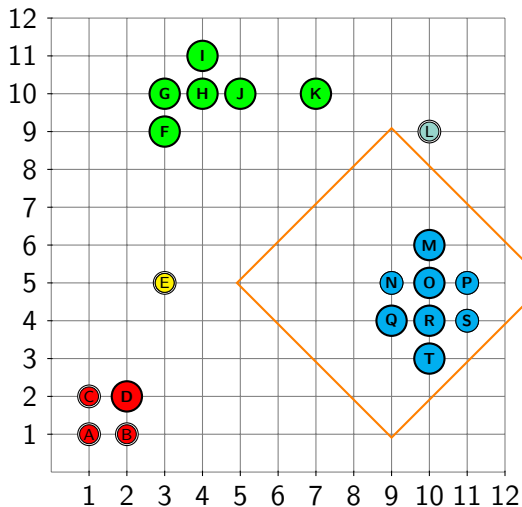
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$$\text{minPts} = 5$$

Seed list:

NPS

DBSCAN



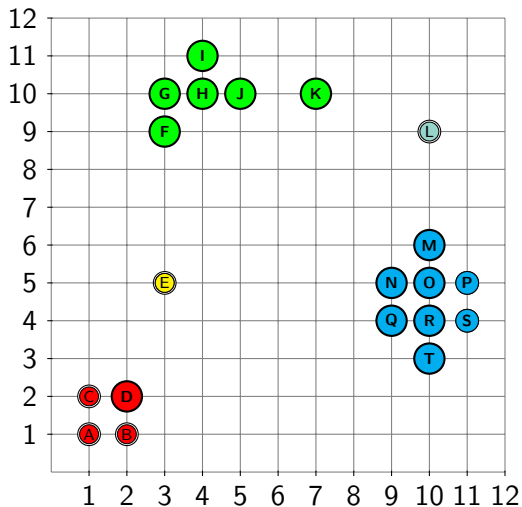
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$$\text{minPts} = 5$$

Seed list:

PS

DBSCAN



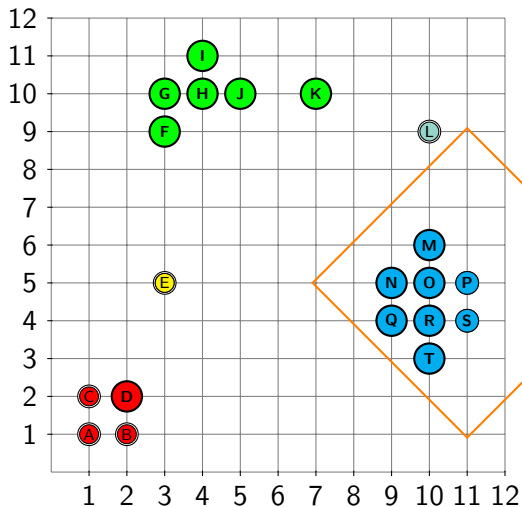
$$\epsilon = 4.1$$

$$\text{minPts} = 5$$

Seed list:

PS

DBSCAN



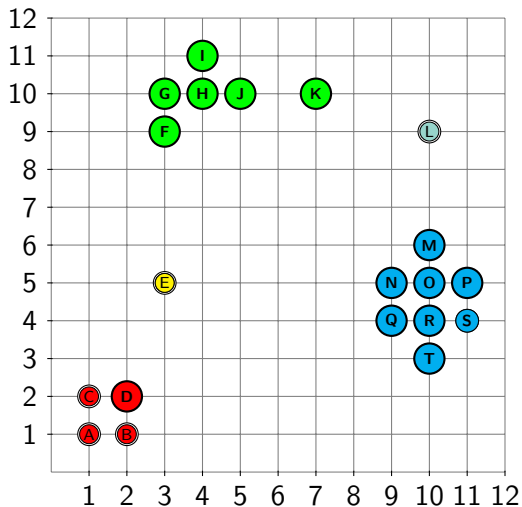
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$$\text{minPts} = 5$$

Seed list:

S

DBSCAN



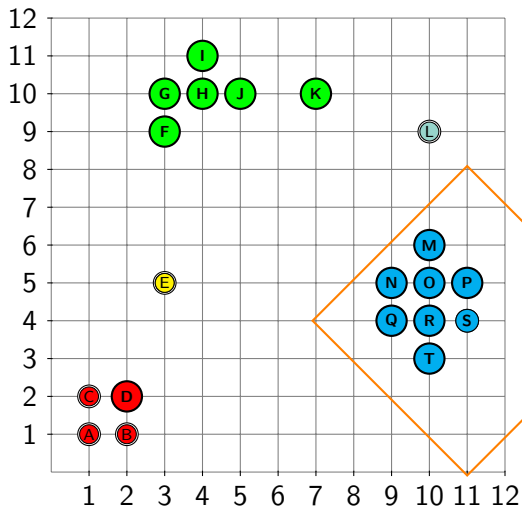
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$$\text{minPts} = 5$$

Seed list:

S

DBSCAN

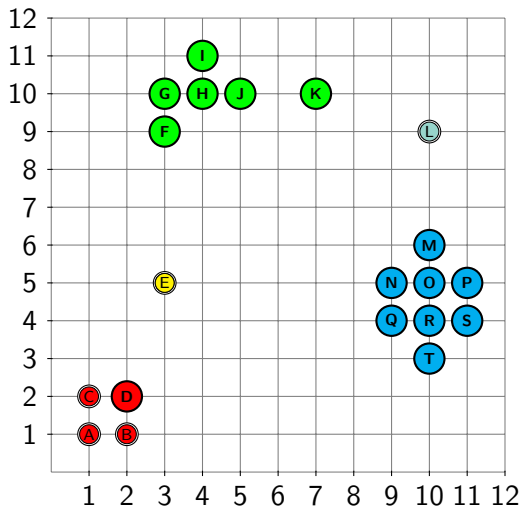


$$\varepsilon = 4.1$$

$$\text{minPts} = 5$$

Seed list:

DBSCAN

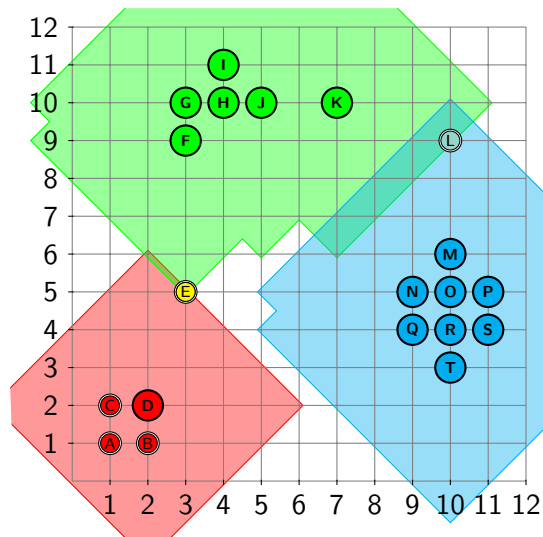


$$\varepsilon = 4.1$$

$$\text{minPts} = 5$$

Seed list:

DBSCAN



$$\varepsilon = 4.1$$

$$\text{minPts} = 5$$

Seed list:

Agenda

DBSCAN

$\varepsilon = 1.1$ minPts= 2

$\varepsilon = 1.1$ minPts= 3

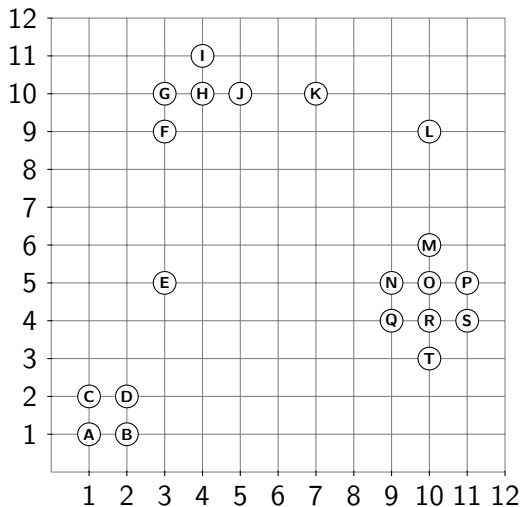
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$\varepsilon = 2.1$ minPts= 4

$\varepsilon = 4.1$ minPts= 5

$\varepsilon = 4.1$ minPts= 4

DBSCAN

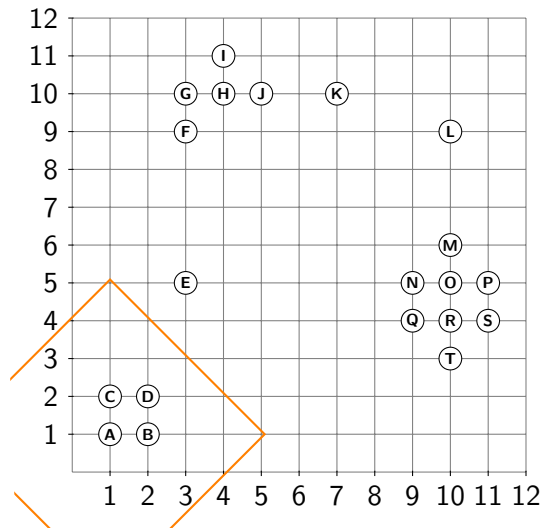


$$\varepsilon = 4.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

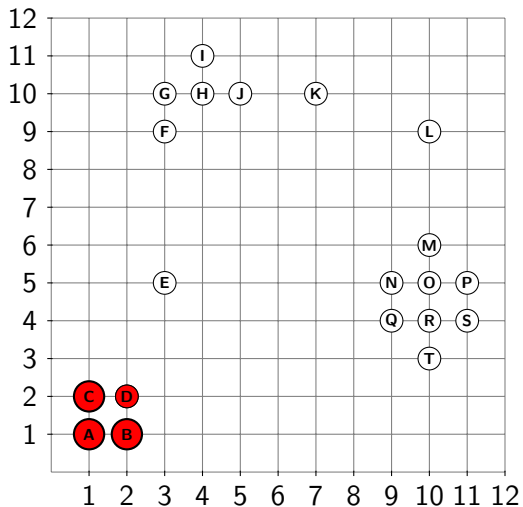


$$\epsilon = 4.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN



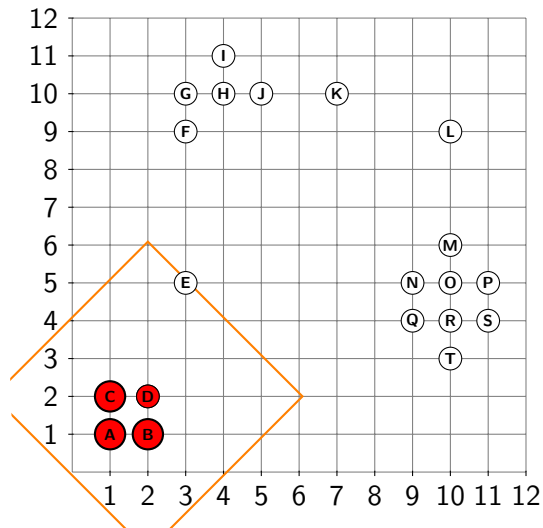
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$$\text{minPts} = 4$$

Seed list:

D

DBSCAN

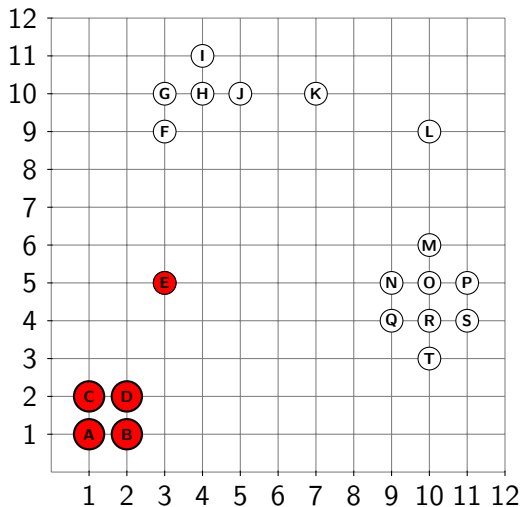


$$\varepsilon = 4.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN



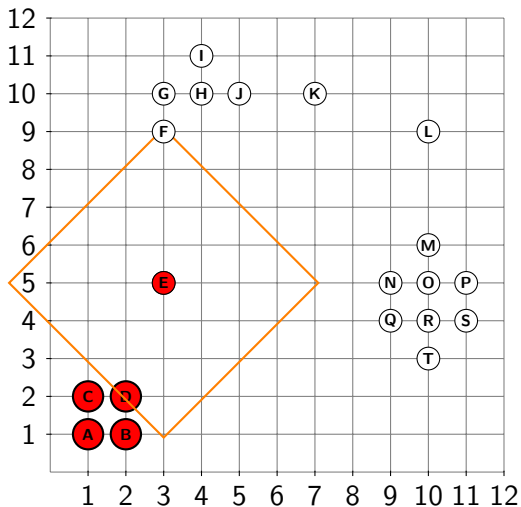
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$$\text{minPts} = 4$$

Seed list:

E

DBSCAN

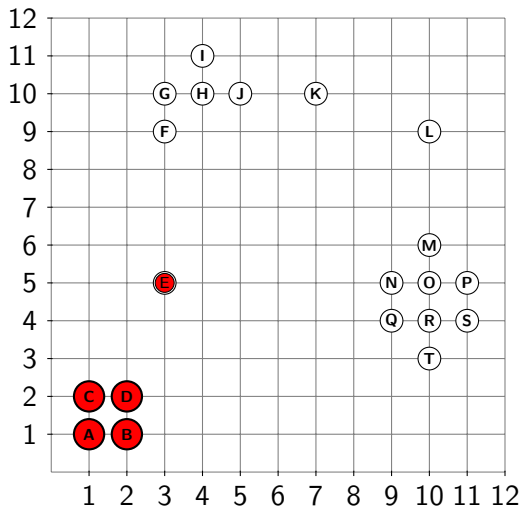


$$\varepsilon = 4.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

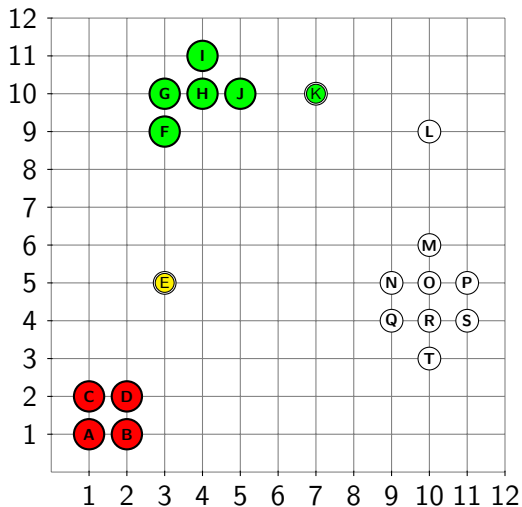


$$\epsilon = 4.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN



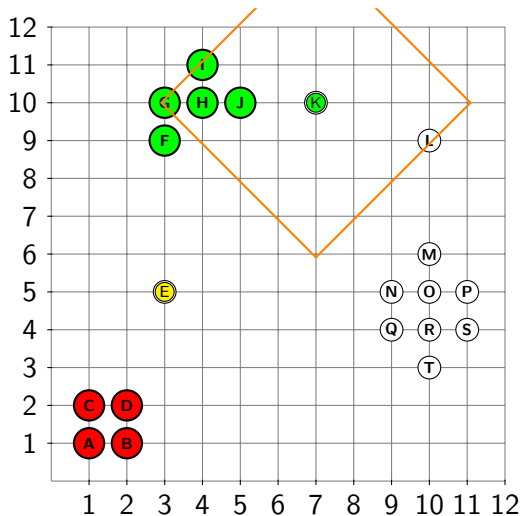
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$$\text{minPts} = 4$$

Seed list:

K

DBSCAN

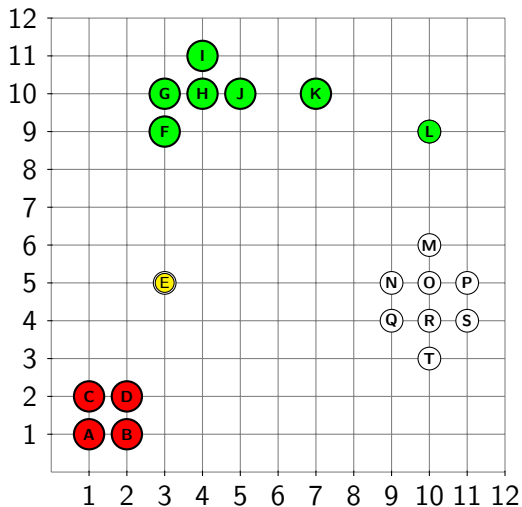


$$\varepsilon = 4.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN



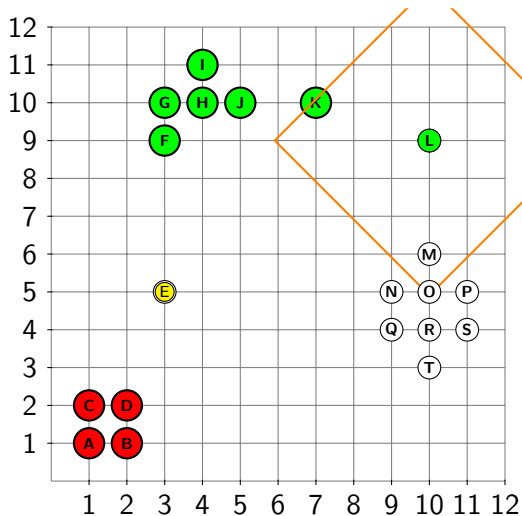
$$\varepsilon = 4.1$$

$$\text{minPts} = 4$$

Seed list:

L

DBSCAN

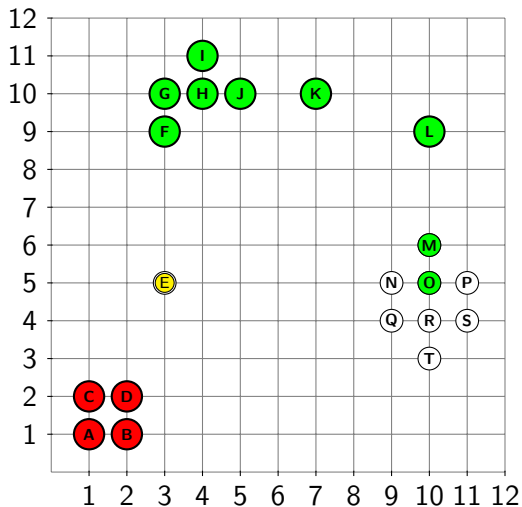


$$\varepsilon = 4.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN



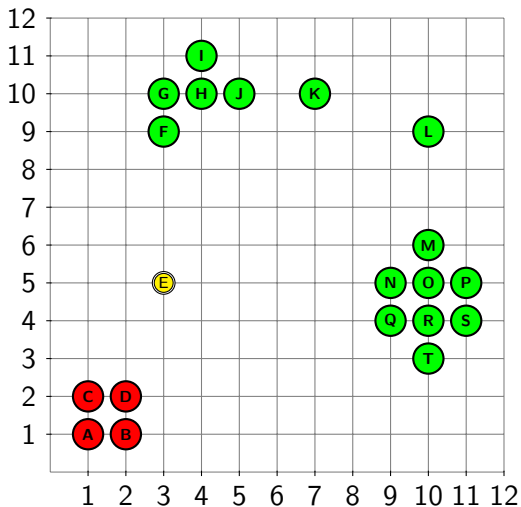
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$$\text{minPts} = 4$$

Seed list:

MO

DBSCAN

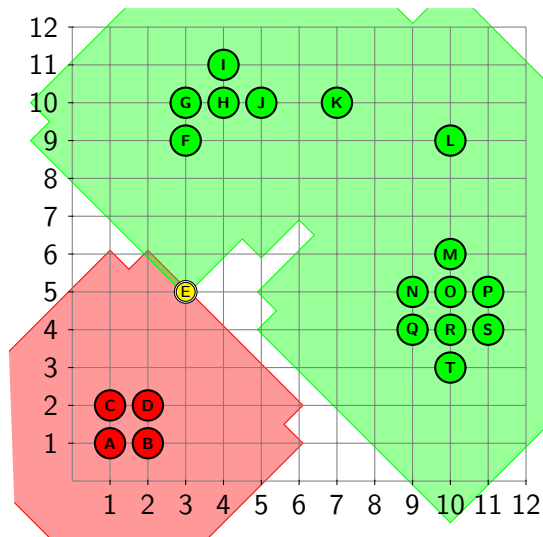


$$\varepsilon = 4.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN

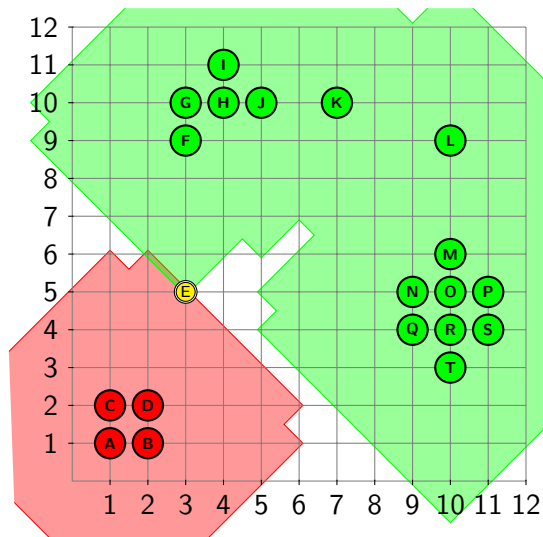


$$\varepsilon = 4.1$$

$$\text{minPts} = 4$$

Seed list:

DBSCAN



$$\varepsilon = 4.1$$

$$\text{minPts} = 4$$

Seed list:

single-link
like effect!