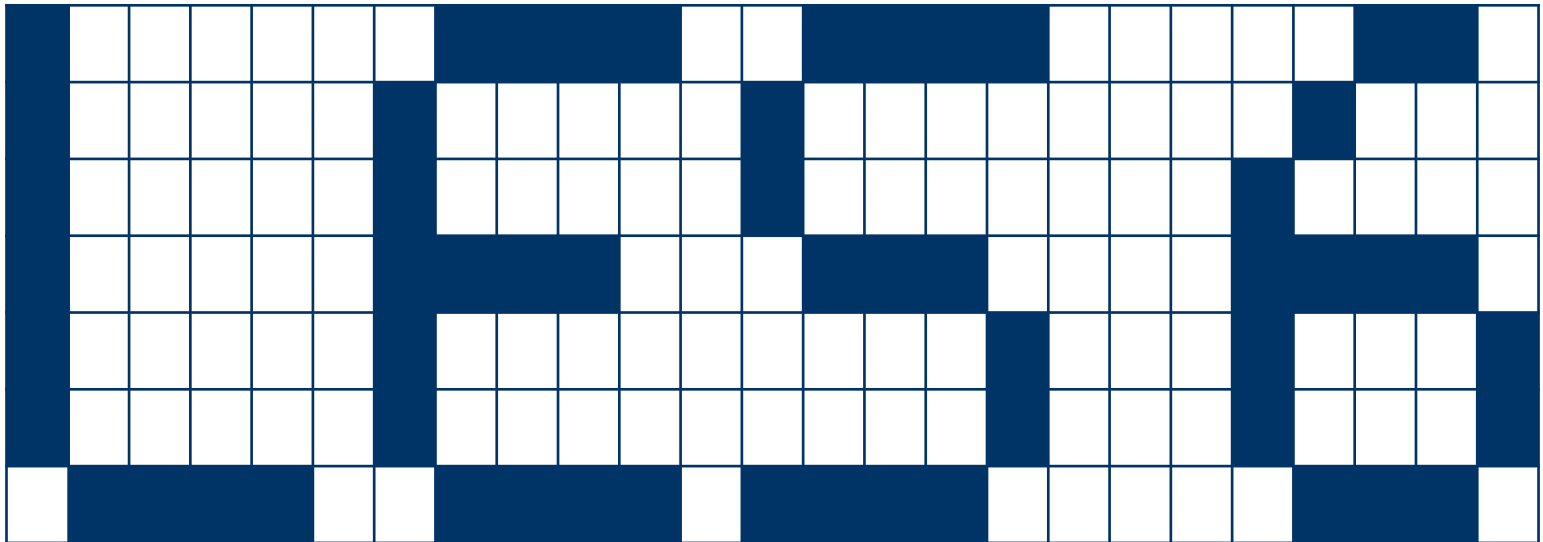


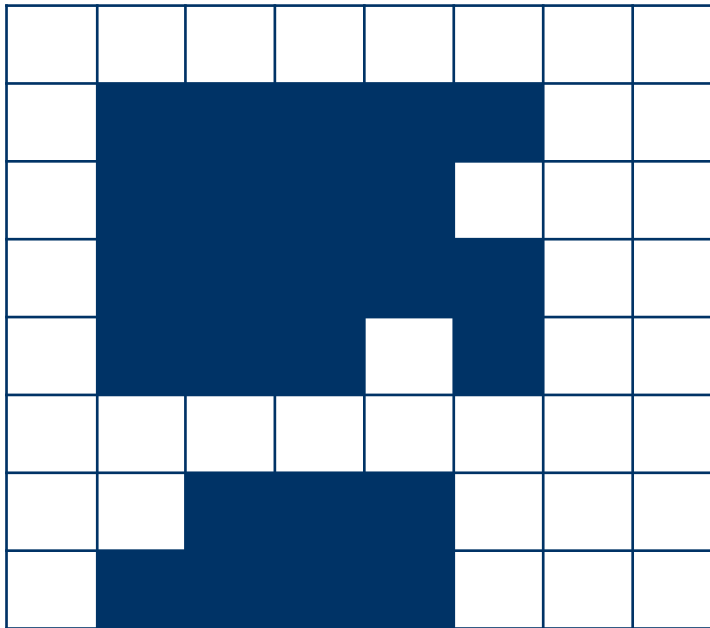


EVD1 – Vision operators

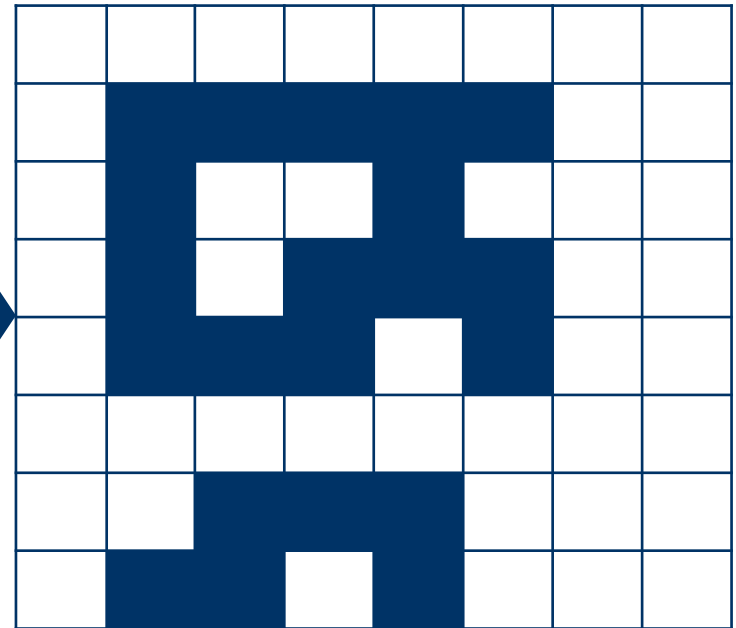




Edge (binary images)



Source

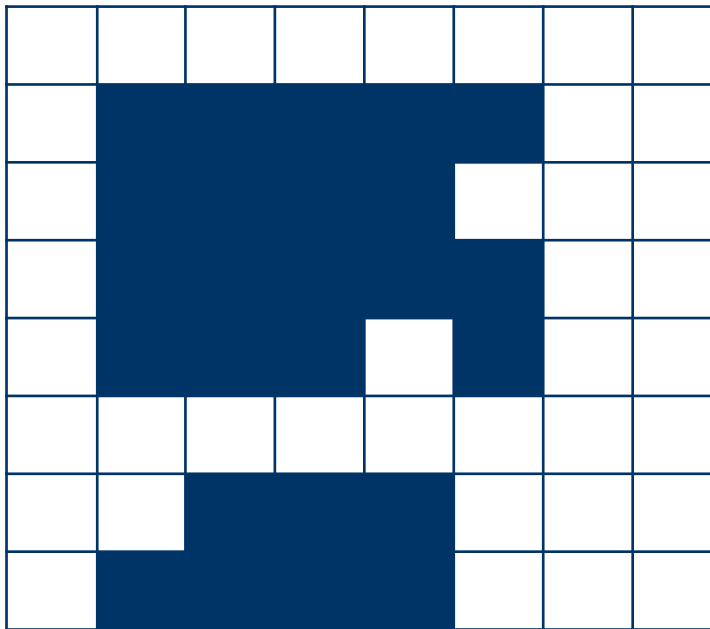


Destination

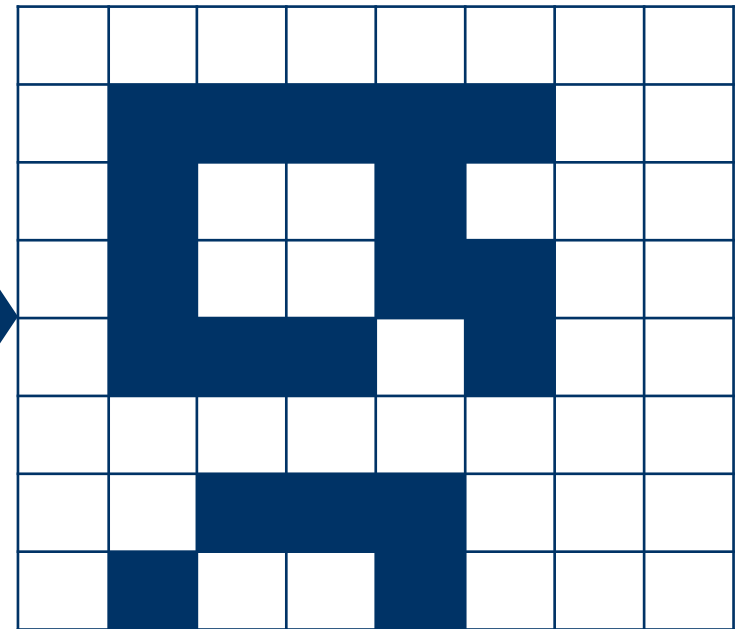
4-connected



Edge (binary images)



Source



Destination

8-connected



Edge (binary images)

| | | | | | | | |
|--|---|---|---|---|---|--|--|
| | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | | 1 | | |
| | | | | | | | |
| | | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | | | |



| | | | | | | | |
|--|---|---|---|---|---|--|--|
| | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | | | 1 | | | |
| | 1 | | | 1 | 1 | | |
| | 1 | 1 | 1 | | 1 | | |
| | | | | | | | |
| | | 1 | 1 | 1 | | | |
| | 1 | | | 1 | | | |

Source

Eenvoudig als $dst \neq src$:
Maak alle pixels 0 die NIET
aan een background
grenzen



Edge (binary images)

| | | | | | | | |
|--|---|---|---|---|---|--|--|
| | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | | 1 | | |
| | | | | | | | |
| | | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | | | |

Source



| | | | | | | | |
|--|---|---|---|---|---|--|--|
| | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | | 1 | | |
| | | | | | | | |
| | | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | | | |

Echter: met hetzelfde
algoritme en $dst = src$



Edge (binary images)

| | | | | | | | |
|--|---|---|---|---|---|--|--|
| | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | | 1 | | |
| | | | | | | | |
| | | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | | | |



| | | | | | | | |
|--|---|---|---|---|---|--|--|
| | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 2 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | | 1 | | |
| | | | | | | | |
| | | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | | | |

Source

Gebruik een marker!



Edge (binary images)

| | | | | | | | |
|--|---|---|---|---|---|--|--|
| | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | | 1 | | |
| | | | | | | | |
| | | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | | | |



| | | | | | | | |
|--|---|---|---|---|---|--|--|
| | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 2 | 2 | 1 | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | | 1 | | |
| | | | | | | | |
| | | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | | | |

Source

Gebruik een marker!



Edge (binary images)

| | | | | | | | |
|--|---|---|---|---|---|--|--|
| | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | | 1 | | |
| | | | | | | | |
| | | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | | | |

Source



| | | | | | | | |
|--|---|---|---|---|---|--|--|
| | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 2 | 2 | 1 | | | |
| | 1 | 2 | 2 | 1 | 1 | | |
| | 1 | 1 | 1 | | 1 | | |
| | | | | | | | |
| | | 1 | 1 | 1 | | | |
| | 1 | 2 | 2 | 1 | | | |

Destination



Edge (binary images)

| | | | | | | | |
|--|---|---|---|---|---|--|--|
| | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | 1 | 1 | | 1 | | |
| | | | | | | | |
| | | 1 | 1 | 1 | | | |
| | 1 | 1 | 1 | 1 | | | |



| | | | | | | | |
|--|---|---|---|---|---|--|--|
| | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | | |
| | 1 | | | 1 | | | |
| | 1 | | | 1 | 1 | | |
| | 1 | 1 | 1 | | 1 | | |
| | | | | | | | |
| | | 1 | 1 | 1 | | | |
| | 1 | | | 1 | | | |

Source

Zet marker op 0



Edge (binary images)

Opdracht

Implementeer de functies:

- `iNeighboursEqualOrHigher()`
- `vBinaryEdgeDetect()`