

# Algoritmiek

## Onderwerpen:

Sorteren (StraightSelectionSort, Bubblesort, InsertionSort)

Backtracking

Convex Hull

Recursie

Sorteren (QuickSort / MergeSort)

Sorteren (mbv een binaire boom)

'Greedy' algoritmes

Kortste pad (Dijkstra, Bellman-Ford, A\* algoritme)

Alle kortste paden (Floyd-Warshall, Johnson)

Minimaal opspannende boom (Prim, Kruskal)

Kortste routes (handelsreizigesprobleem)

Maximale stroom (Ford Fulkerson)

Complexiteit

Heuristieken

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Minimaal opspannende boom (Prim, Kruskal)

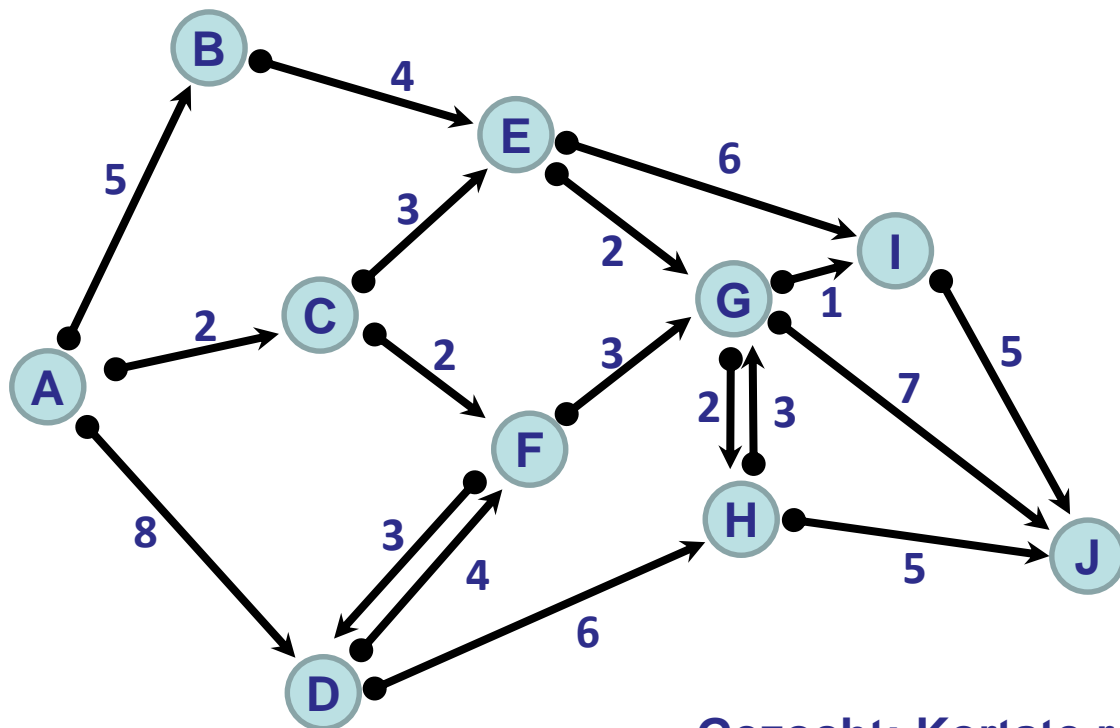
Kortste routes (handelsreizigesprobleem)

Maximale stroom (Ford Fulkerson)

Complexiteit

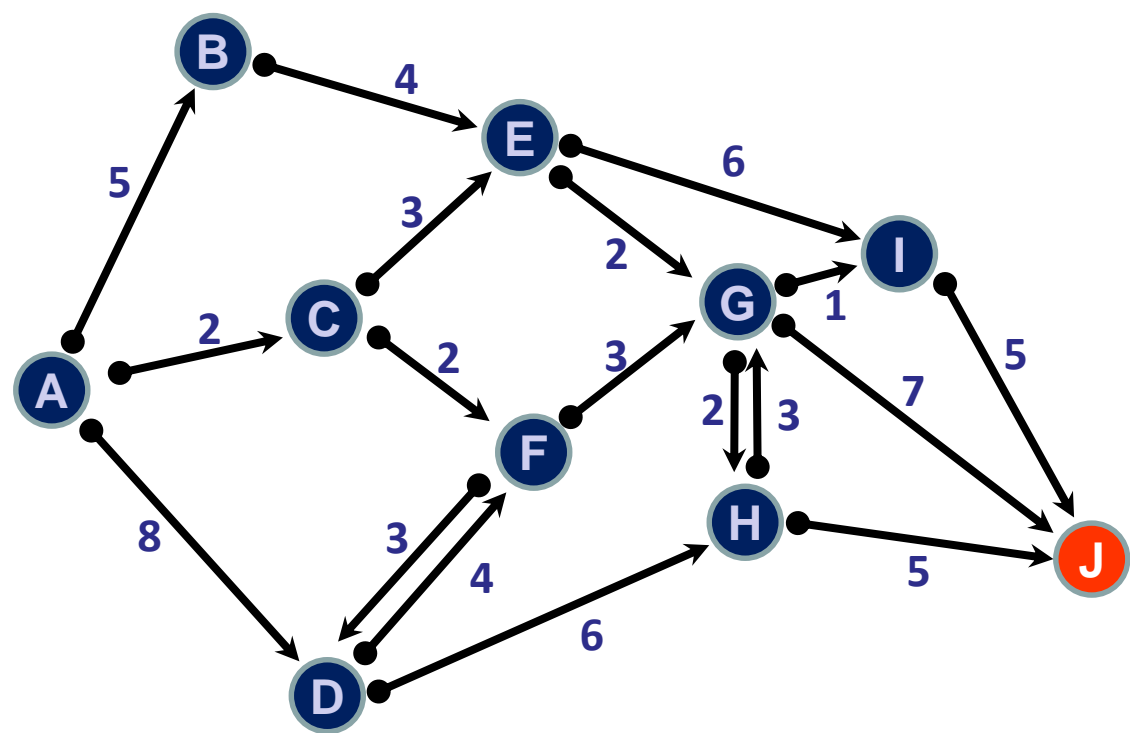
Heuristieken

# Dijkstra's algoritme



Gezocht: Kortste route van A naar J

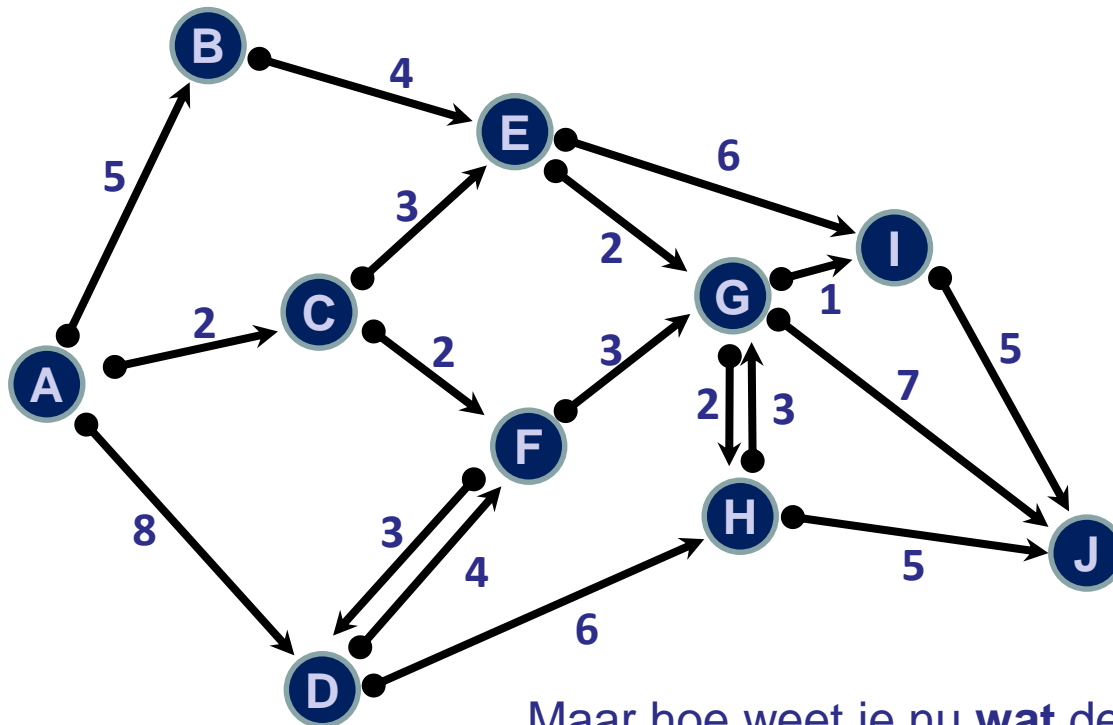
# Dijkstra's algoritme



A	0
B	5
C	2
D	7
E	5
F	4
G	7
H	9
I	8
J	13

# Dijkstra's algoritme

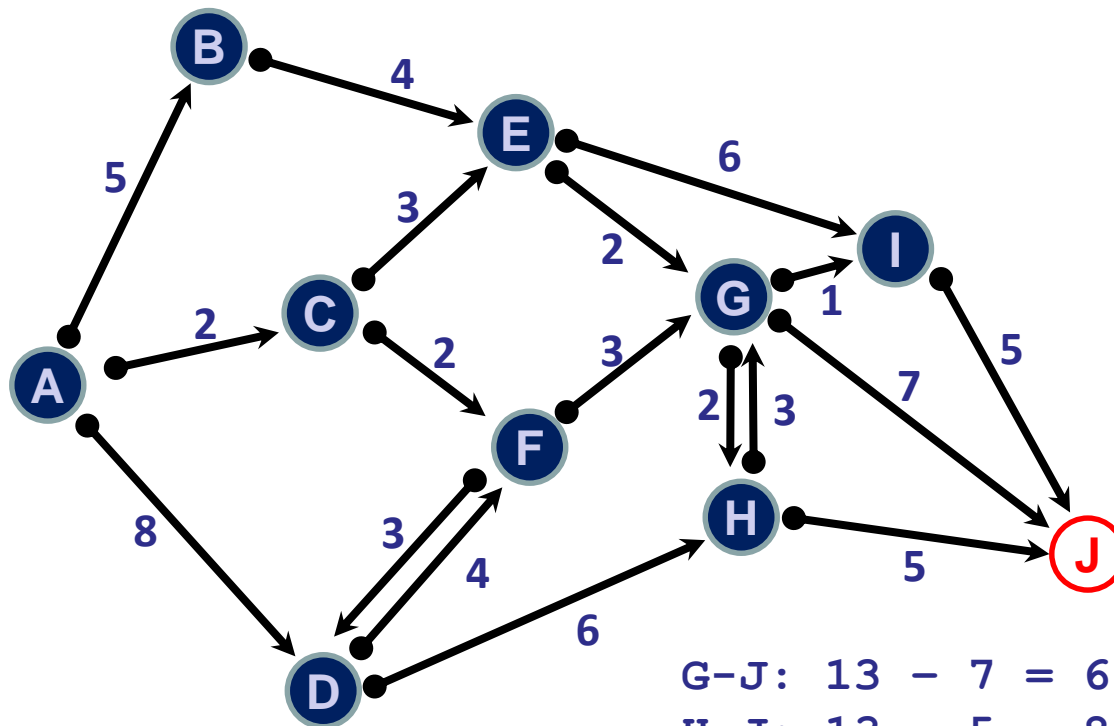
Er is nu berekend **hoe lang** de kortste route is...



Maar hoe weet je nu **wat** de route is?

A	0
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## Dijkstra's algoritme



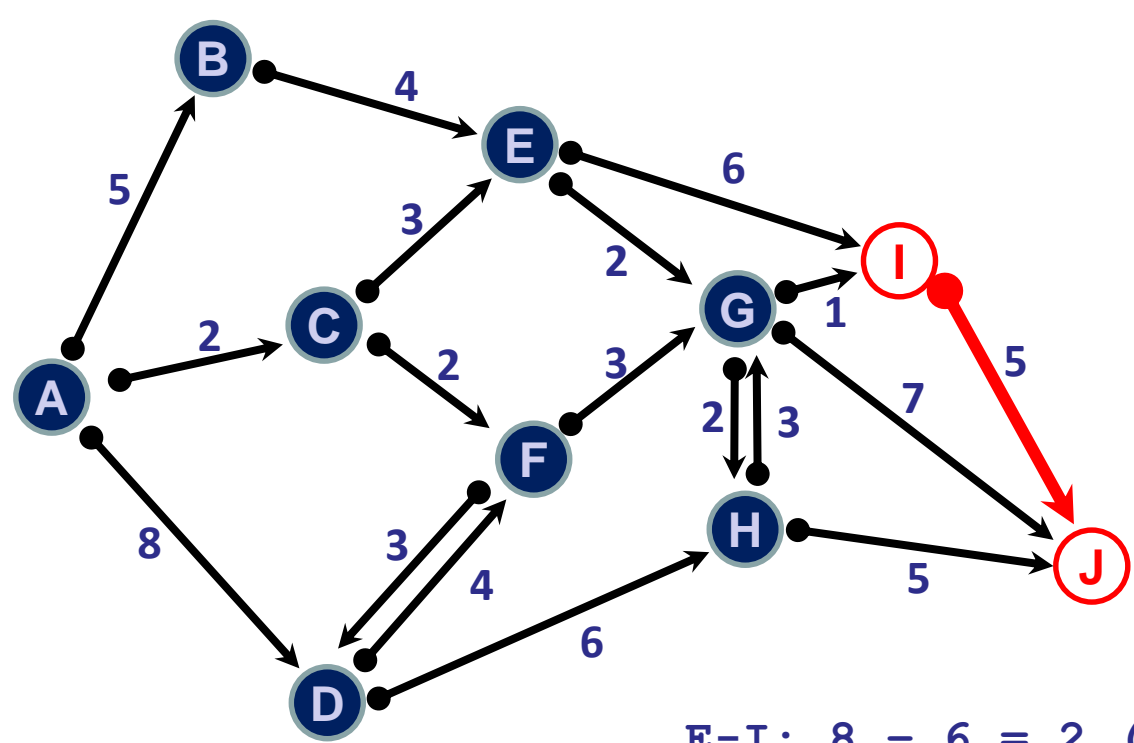
$$G-J: 13 - 7 = 6 \quad (\neq d_G)$$

$$H-J: 13 - 5 = 8 \quad (\neq d_H)$$

$$I-J: 13 - 5 = 8 \quad (= d_I)$$

A	0
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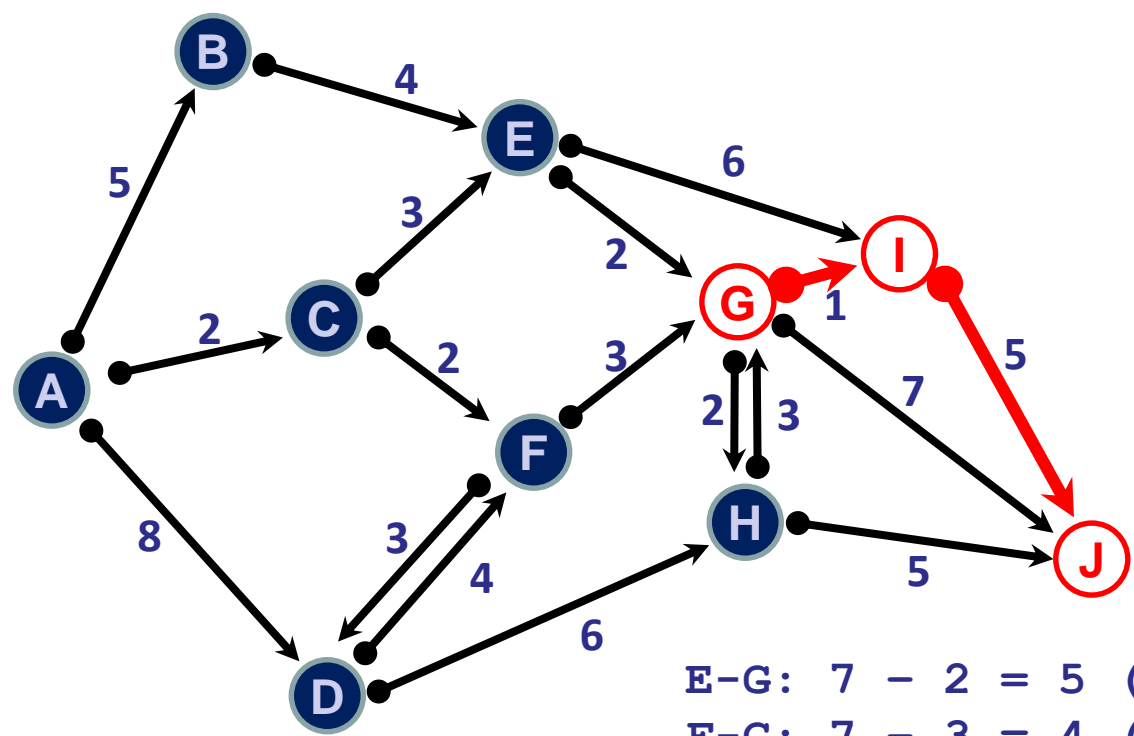
# Dijkstra's algoritme



$E-I: 8 - 6 = 2 \quad (\neq d_E)$   
 $G-I: 8 - 1 = 7 \quad (= d_G)$

A	0
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# Dijkstra's algoritme

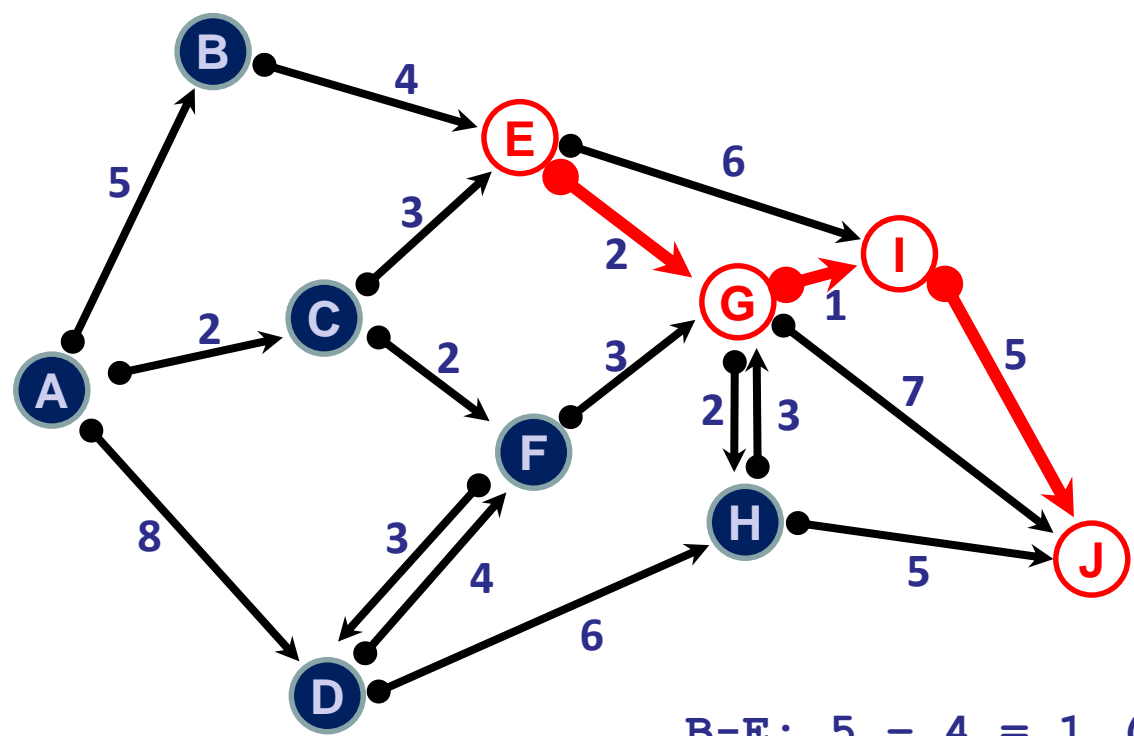


$E-G: 7 - 2 = 5 \quad (= d_E)$   
 $F-G: 7 - 3 = 4 \quad (= d_F)$   
 $H-G: 7 - 3 = 4 \quad (\neq d_H)$

A	0
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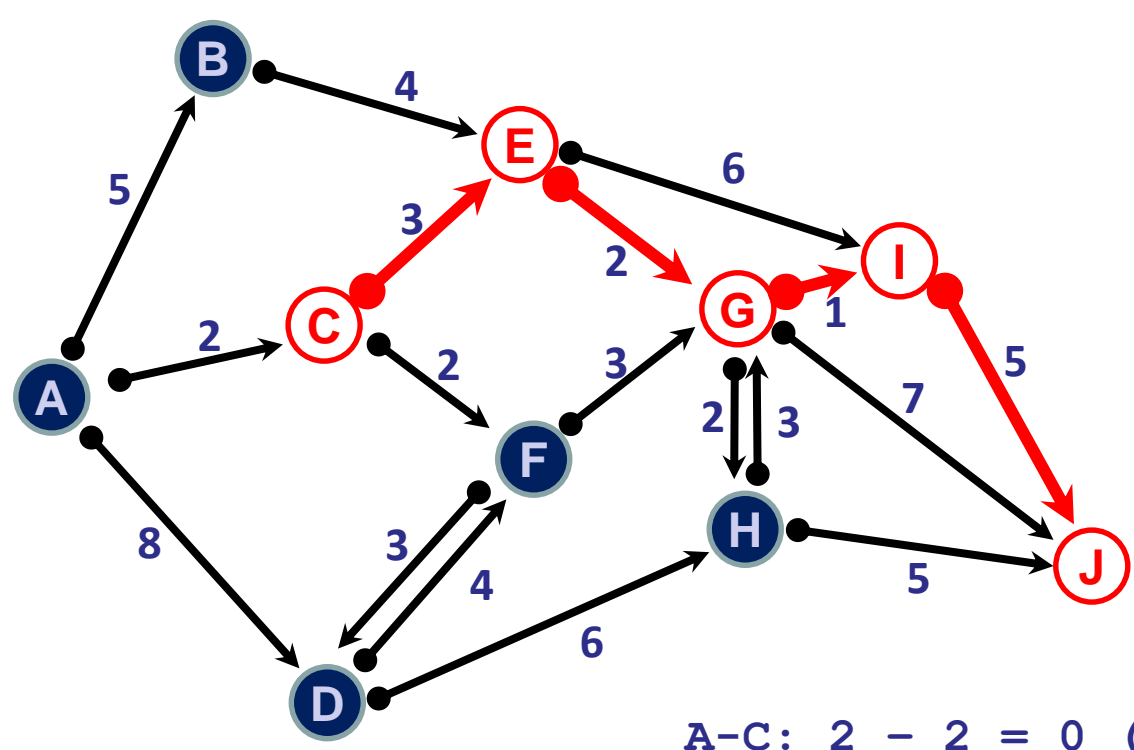
# Dijkstra's algoritme



$B-E: 5 - 4 = 1 \quad (\neq dB)$   
 $C-E: 5 - 3 = 2 \quad (= dC)$

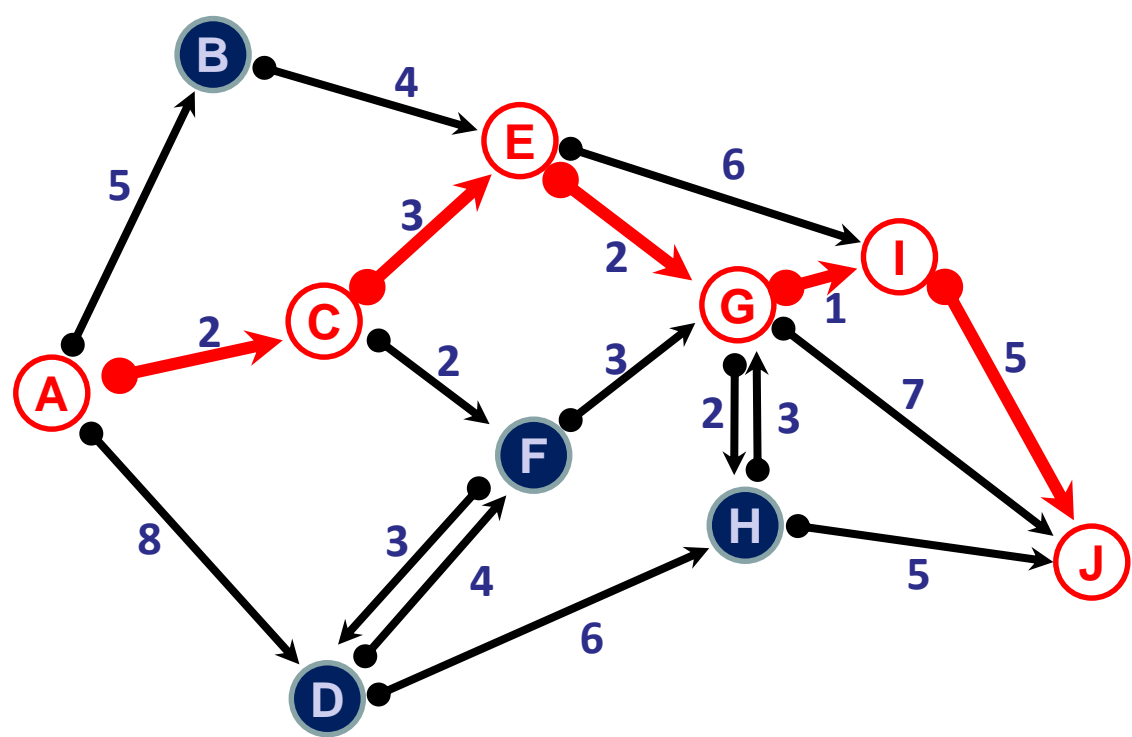
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# Dijkstra's algoritme

**Volgende les (08c):**

**uitwerking in (pseudo)code**

