DMA 2016

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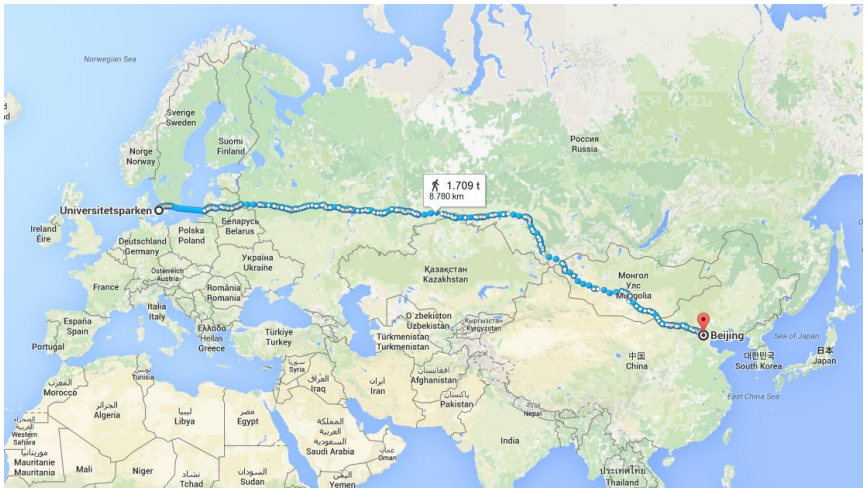
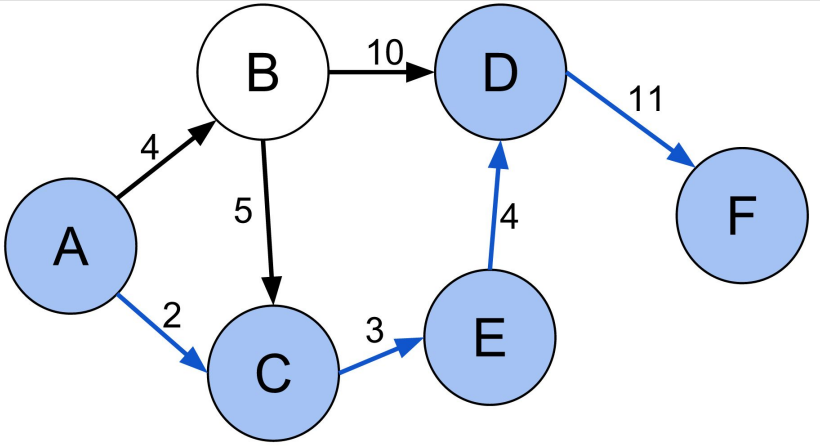




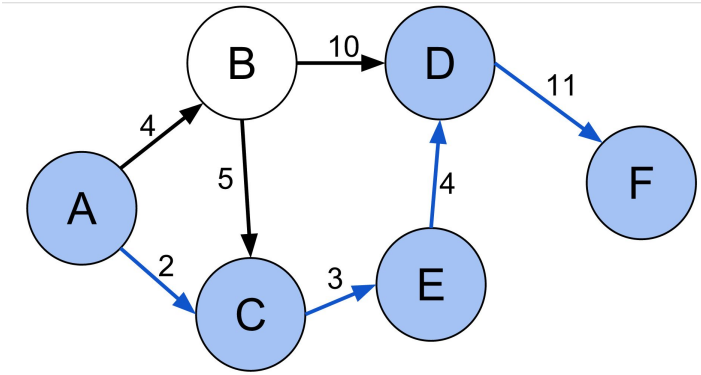
Diskret **M**atematik og **A**lgoritmer?

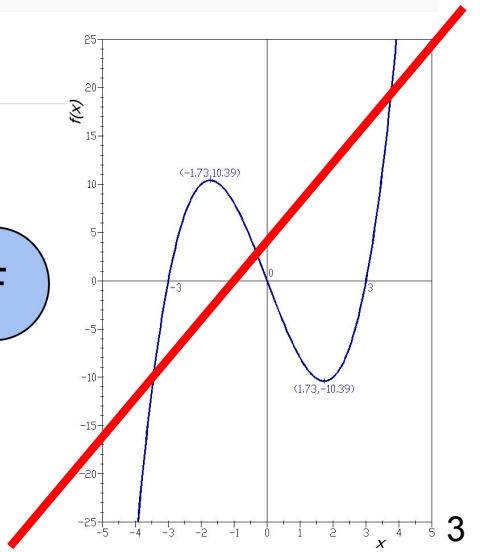
Hvad er DMA?

Algoritme: en præcis beskrivelse af instruktioner som leder til et ønsket mål
- en avanceret opskrift

```
1  function Dijkstra(Graph, source):
2
3      dist[source] ← 0                          // Distance from source to source
4      prev[source] ← undefined                  // Previous node in optimal path initialization
5
6      create vertex set Q
7
8      for each vertex v in Graph:               // Initialization
9          if v ≠ source:                        // v has not yet been removed from Q (unvisited nodes)
10             dist[v] ← INFINITY                // Unknown distance from source to v
11             prev[v] ← UNDEFINED               // Previous node in optimal path from source
12         add v to Q                            // All nodes initially in Q (unvisited nodes)
13
14     while Q is not empty:
15         u ← vertex in Q with min dist[u]      // Source node in the first case
16         remove u from Q
17
18         for each neighbor v of u:             // where v is still in Q.
19             alt ← dist[u] + length(u, v)
20             if alt < dist[v]:                 // A shorter path to v has been found
21                 dist[v] ← alt
22                 prev[v] ← u
23
24     return dist[], prev[]
```

Diskret Matematik: matematik der omhandler diskrete objekter - tal, logik, grafer, kombinationer - i modsætning til kontinuert matematik





Dijkstras Algoritme

```
DIJKSTRA(G, w, s)
1  INITIALIZE-SINGLE-SOURCE(G, s)
2  S = ∅
3  Q = G.V
4  while Q ≠ ∅
5      u = EXTRACT-MIN(Q)
6      S = S ∪ {u}
7      for each vertex v ∈ G.Adj[u]
8          RELAX(u, v, w)
```

DMA vil (blandt andet) indeholde

- algoritmer
- pseudokode
- diskrete matematiske objekter
- beviser for korrekthed
- typer af algoritmer
- kompleksitet

Store Grafer

Hvem er DMA?

jer!

Stefan Sommer (kursusansvarlig)

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Velkommen!