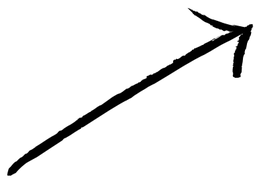
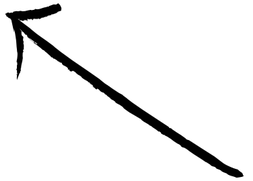
A* Search Algorithm

$$f(n) = g(n) + h(n)$$

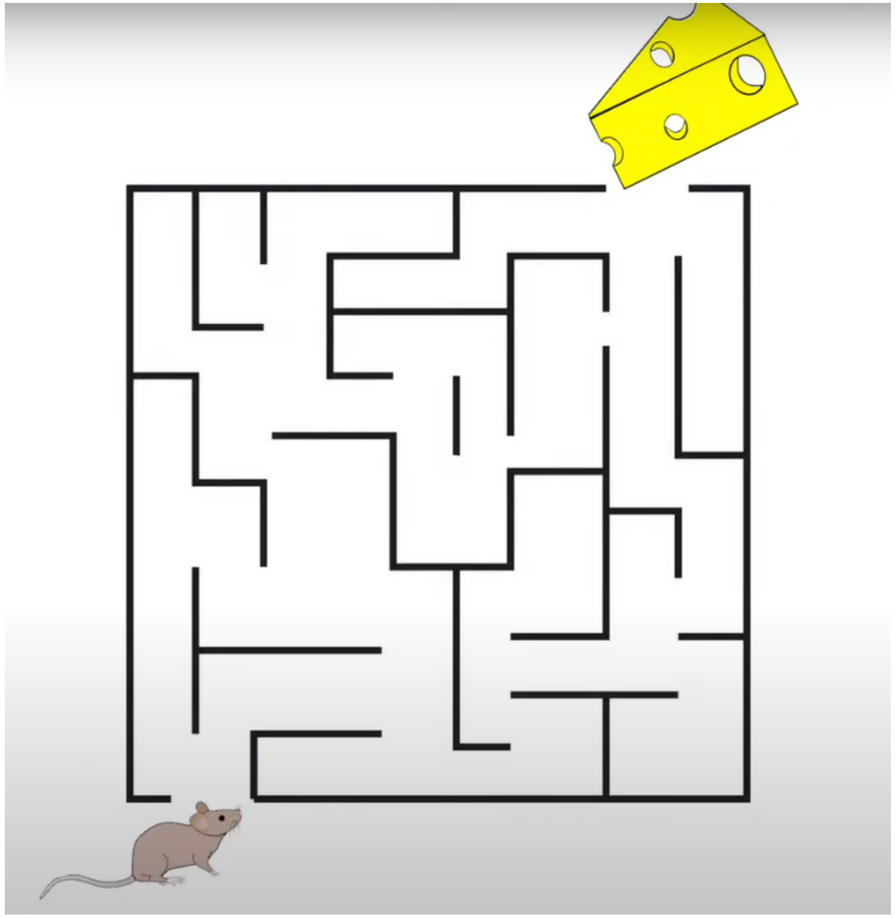


cost to reach the current node from start node

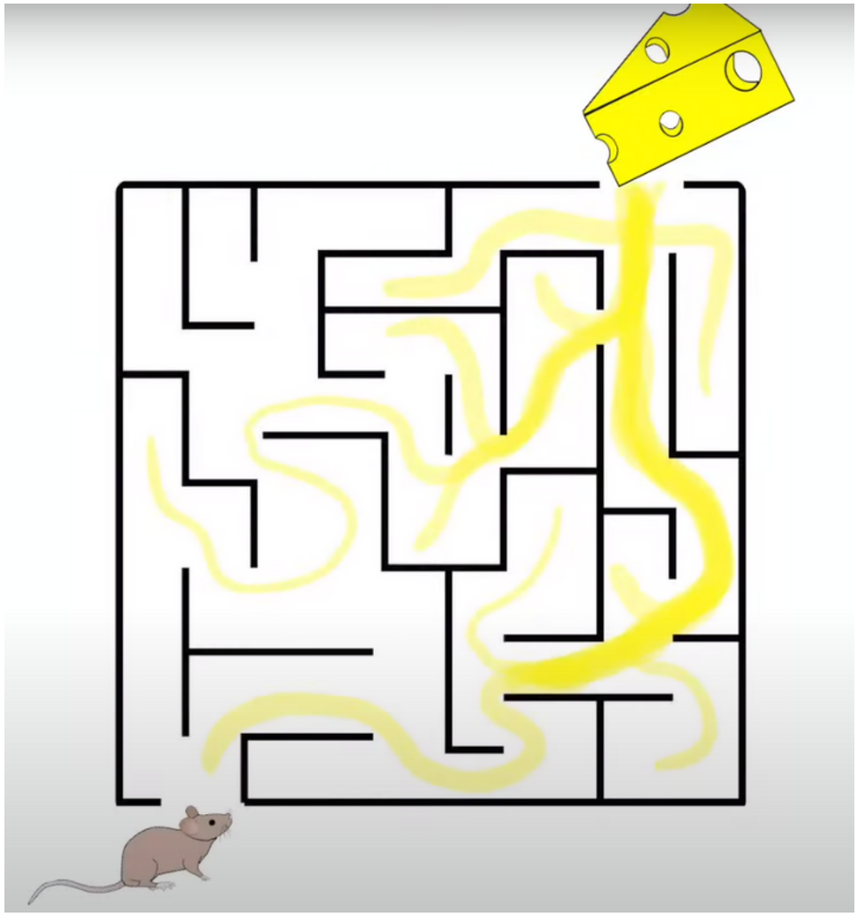


cost to reach goal node from current node

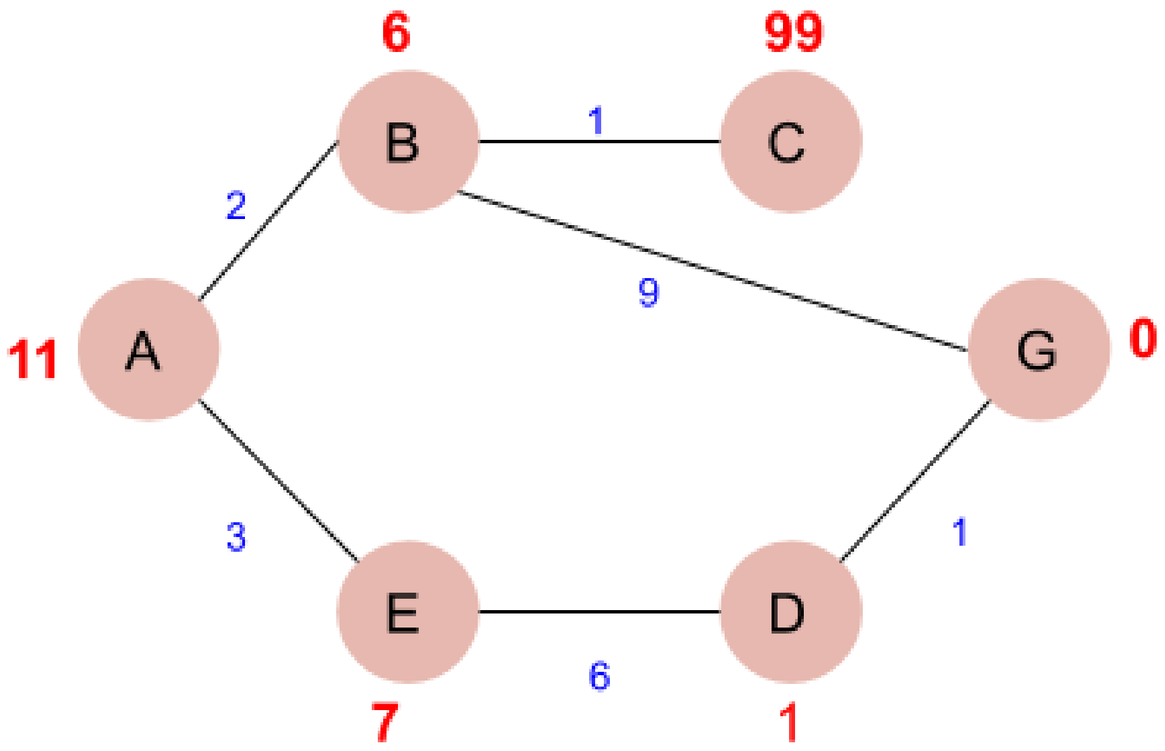
without heuristics



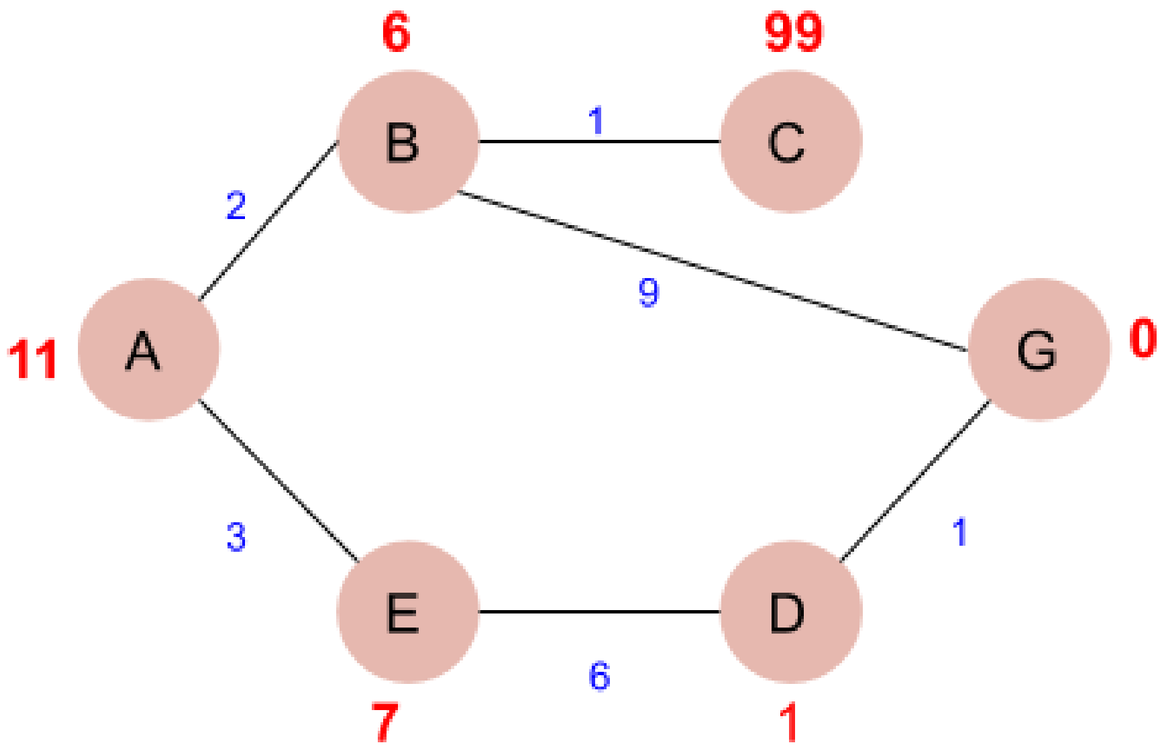
with heuristics



START: A GOAL : G f(A) = 0 + 11 = 11



START: A GOAL : G

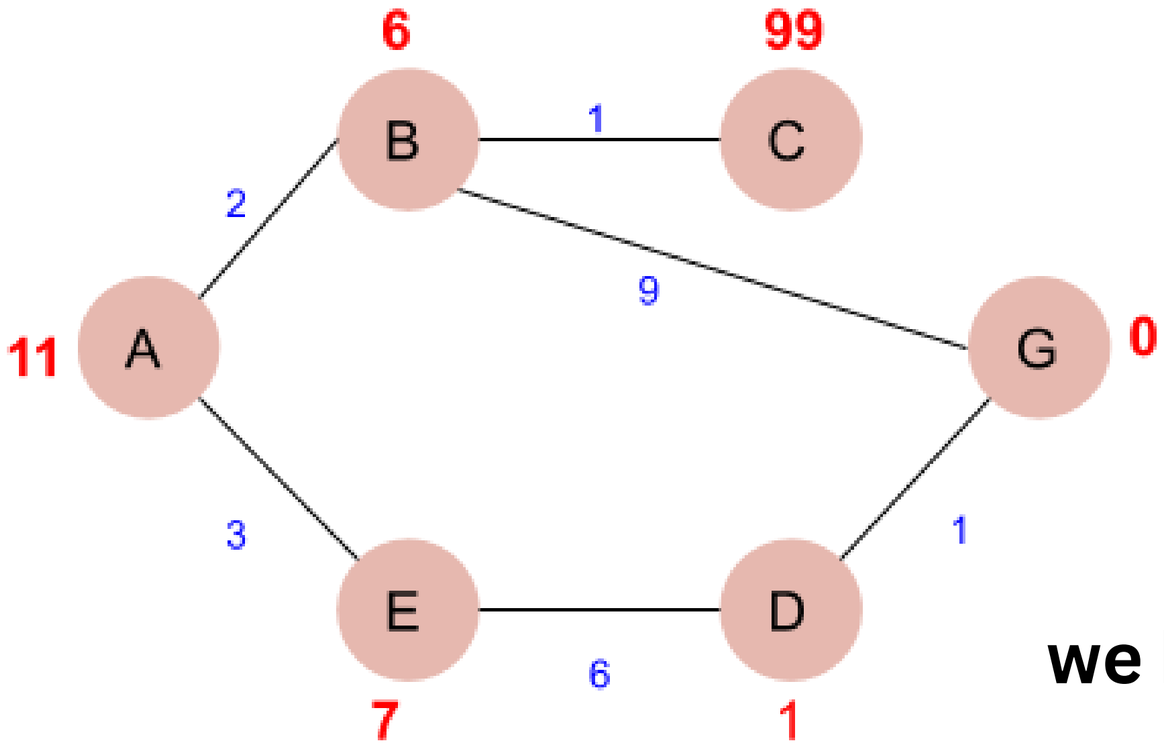


$f(A) = 0 + 11 = 11$

$f(A\text{-}B) = 2 + 6 = 8$

$f(A\text{-}E) = 3 + 7 = 10$

START: A GOAL : G



f(A) = 0 + 11 = 11

f(A-B) = 2 + 6 = 8

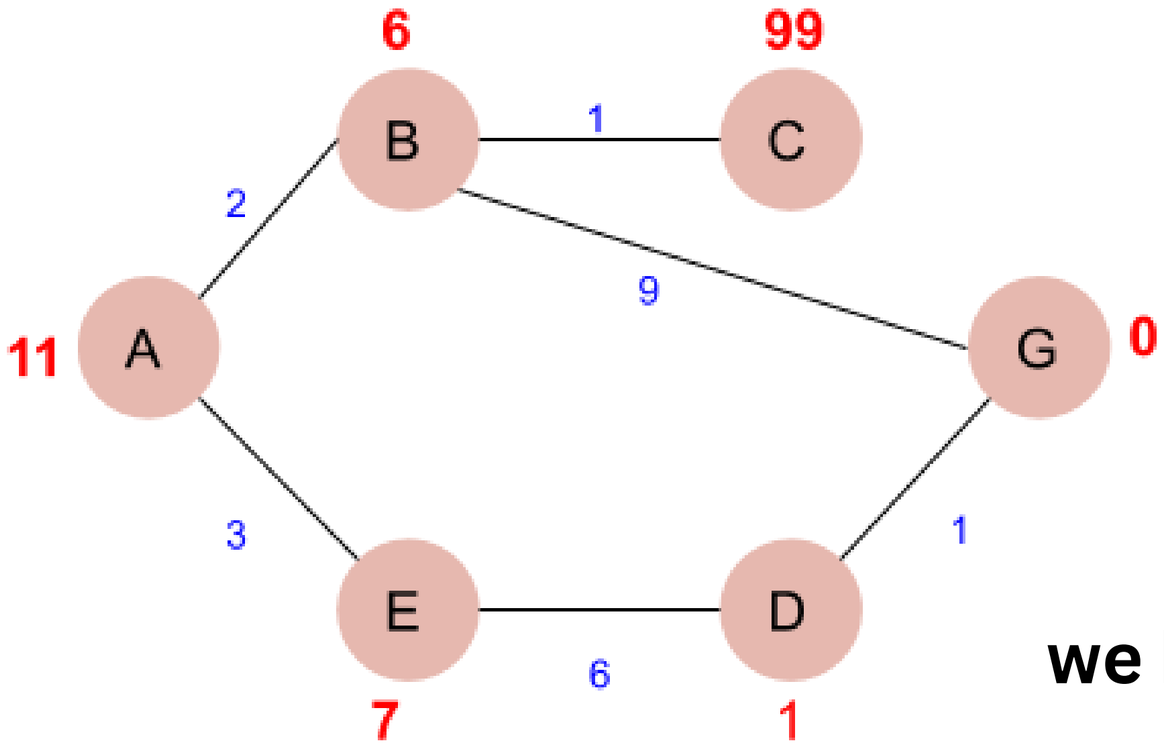
f(A-E) = 3 + 7 = 10

f(A-B-C) = 3 + 99 = 102

f(A-B-G) = 11 + 0 = 11

we have got to the goal node?

START: A GOAL : G



f(A) = 0 + 11 = 11

f(A-B) = 2 + 6 = 8

f(A-E) = 3 + 7 = 10

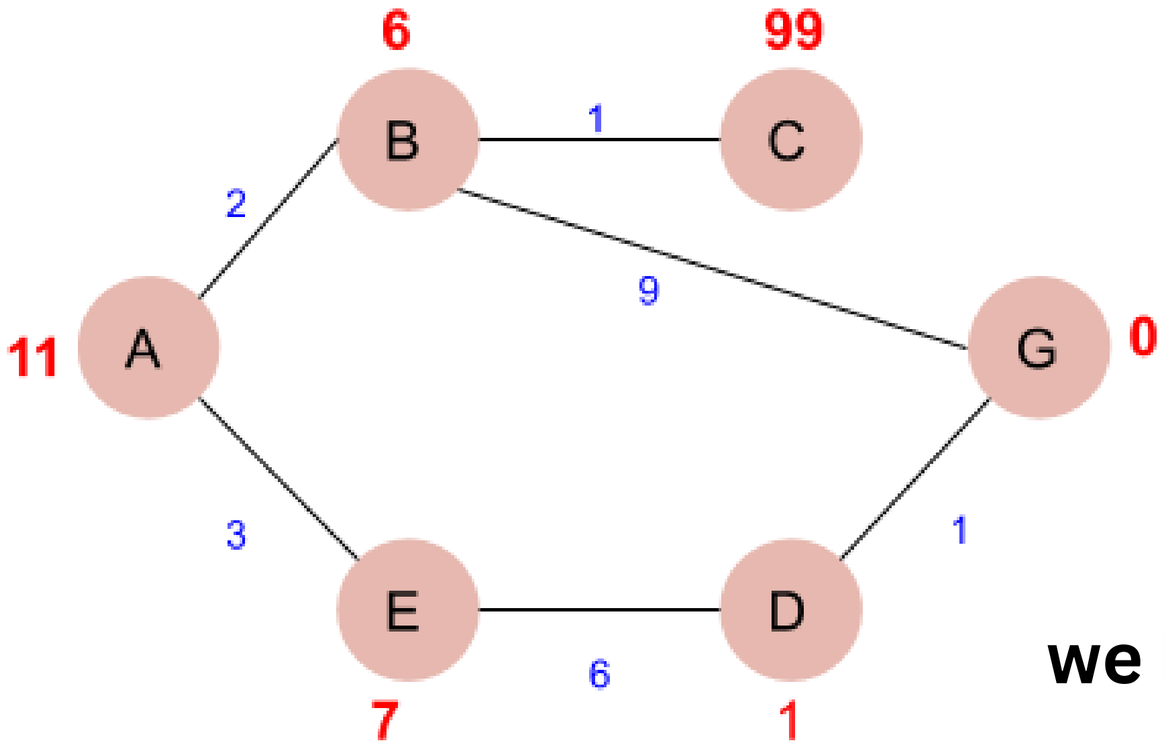
f(A-B-C) = 3 + 99 = 102

f(A-B-G) = 11 + 0 = 11

we have got to the goal node?

but..... we dont know its optimial or not, because we still got the short path alive here

START: A GOAL : G



f(A) = 0 + 11 = 11

f(A-B) = 2 + 6 = 8

f(A-E) = 3 + 7 = 10

f(A-B-C) = 3 + 99 = 102

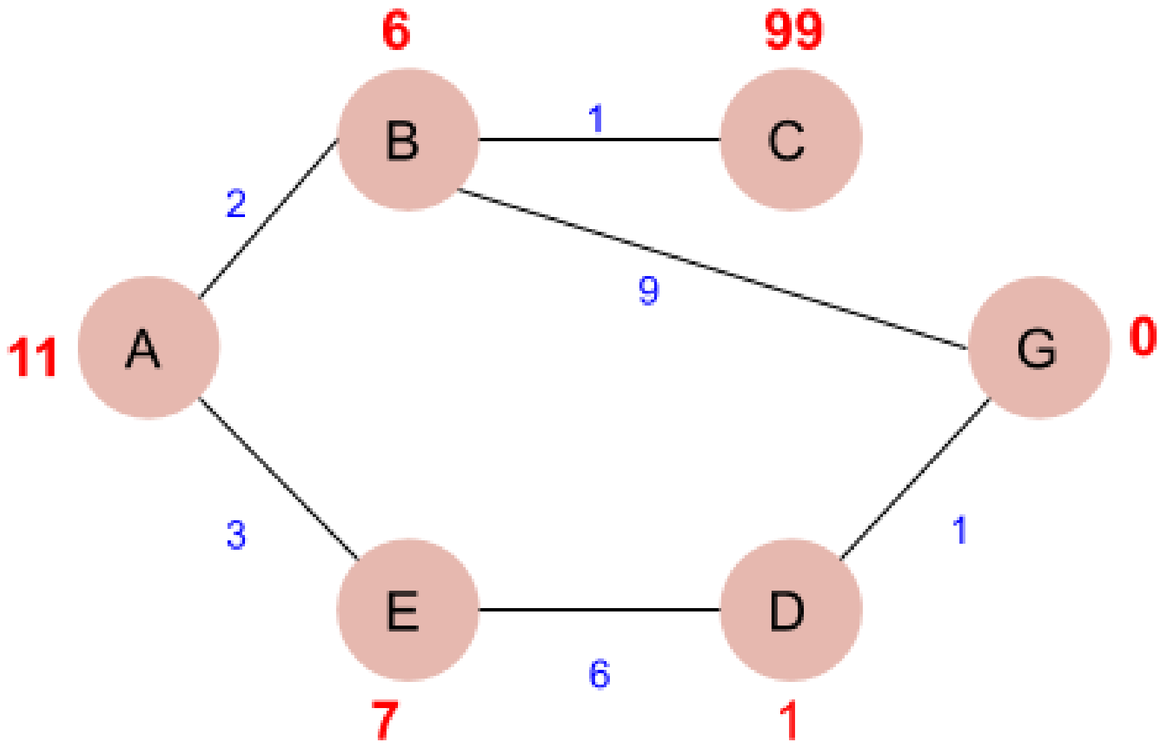
f(A-B-G) = 11 + 0 = 11

we have got to the goal node?

but..... we dont know its optimial or not, because we still got the short path alive here

so we need to check it

START: A GOAL : G



f(A) = 0 + 11 = 11

f(A-B) = 2 + 6 = 8

f(A-E) = 3 + 7 = 10

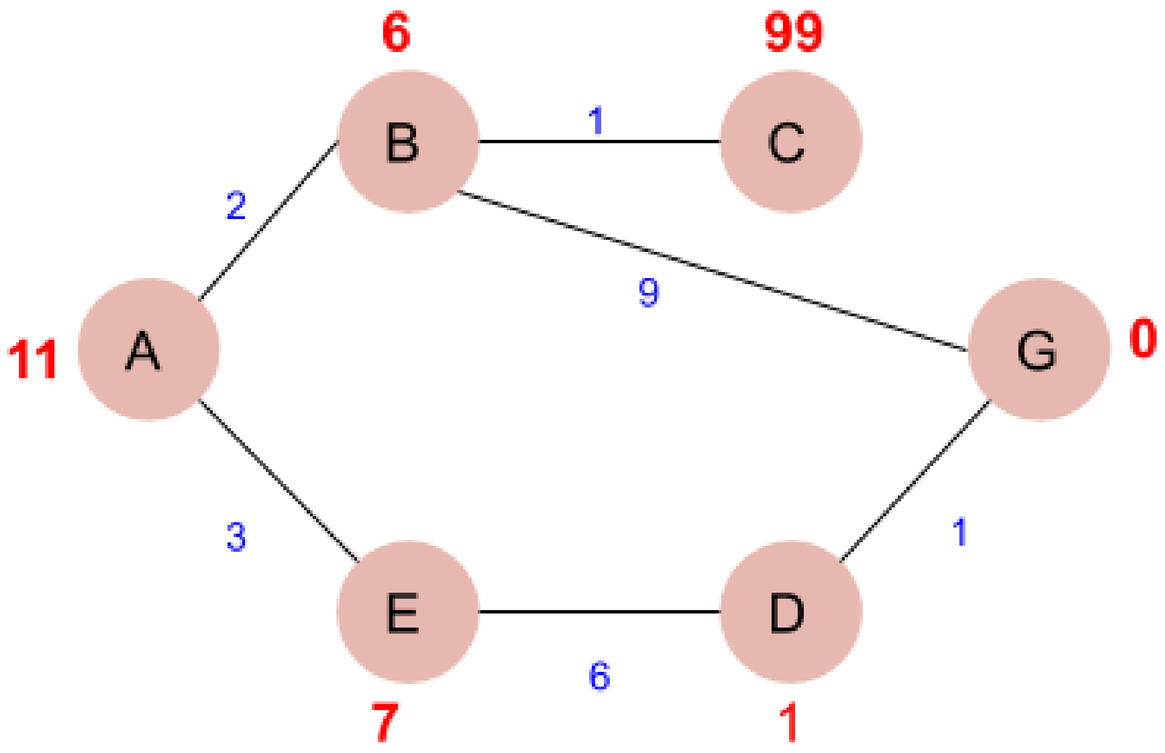
f(A-B-C) = 3 + 99 = 102

f(A-B-G) = 11 + 0 = 11

f(A-E-D) = 9 + 1 = 10

f(A-E-D-G) = 10 + 0 = 10

START: A GOAL : G



f(A) = 0 + 11 = 11

f(A-B) = 2 + 6 = 8

f(A-E) = 3 + 7 = 10

f(A-B-C) = 3 + 99 = 102

f(A-B-G) = 11 + 0 = 11

f(A-E-D) = 9 + 1 = 10

f(A-E-D-G) = 10 + 0 = 10

A-E-D-G is the shortest path in this graph