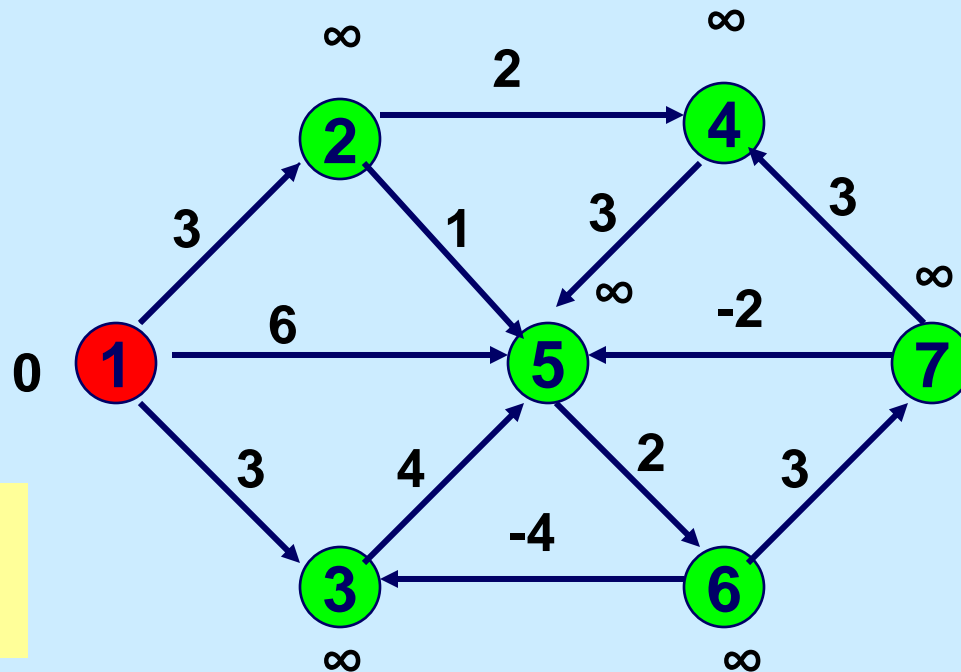


# **15.082J & 6.855J & ESD.78J Visualizations**

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## **Label Correcting Algorithm**

# An Example



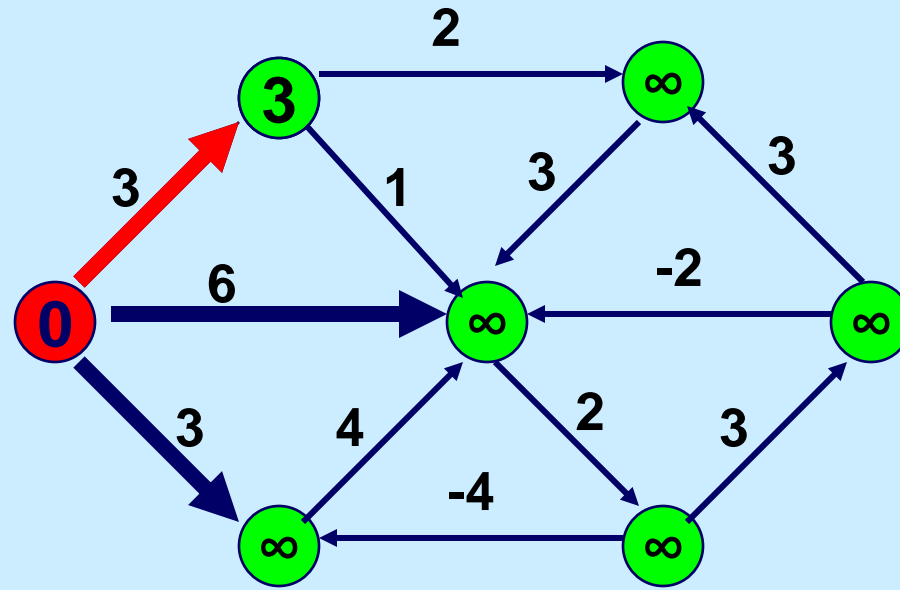
**Initialize**

$d(1) := 0;$

$d(j) := \infty$  for  $j \neq 1$

In next slides: the number inside the node will be  $d(j)$ .

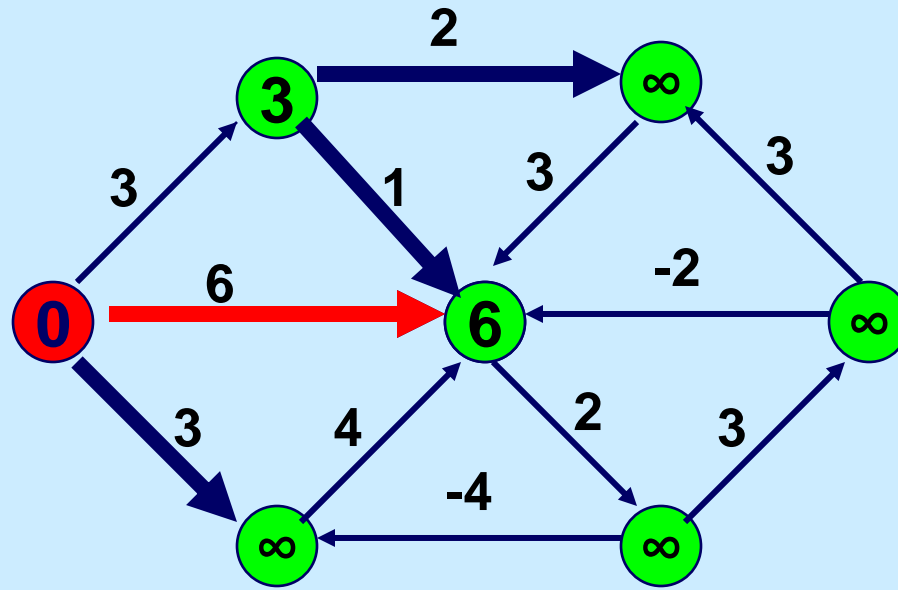
Violating arcs will be in thick lines.



**Generic Step**

An arc  $(i,j)$  is **violating** if  $d(j) > d(i) + c_{ij}$ .

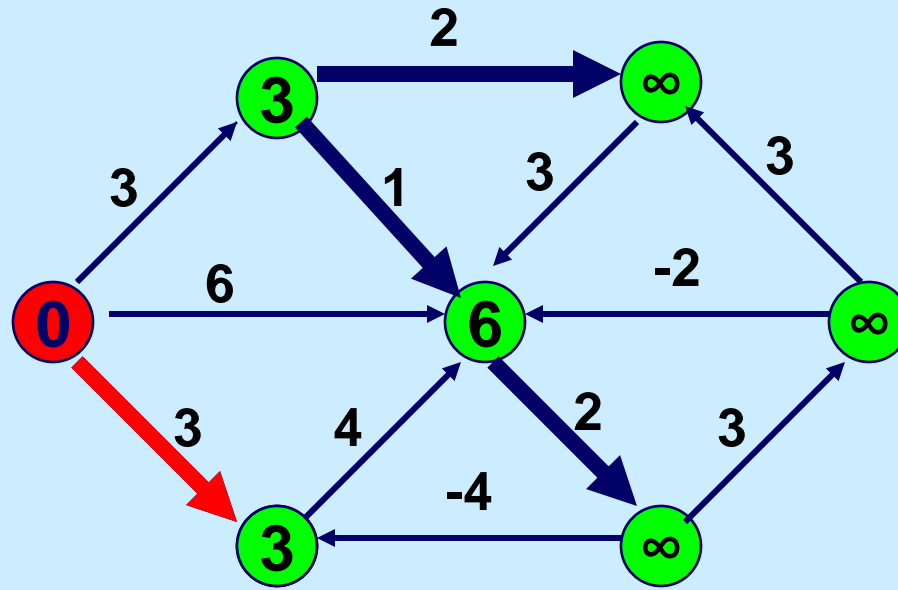
Pick a violating arc  $(i,j)$  and replace  $d(j)$  by  $d(i) + c_{ij}$ .



**Generic Step**

An arc  $(i,j)$  is **violating** if  $d(j) > d(i) + c_{ij}$ .

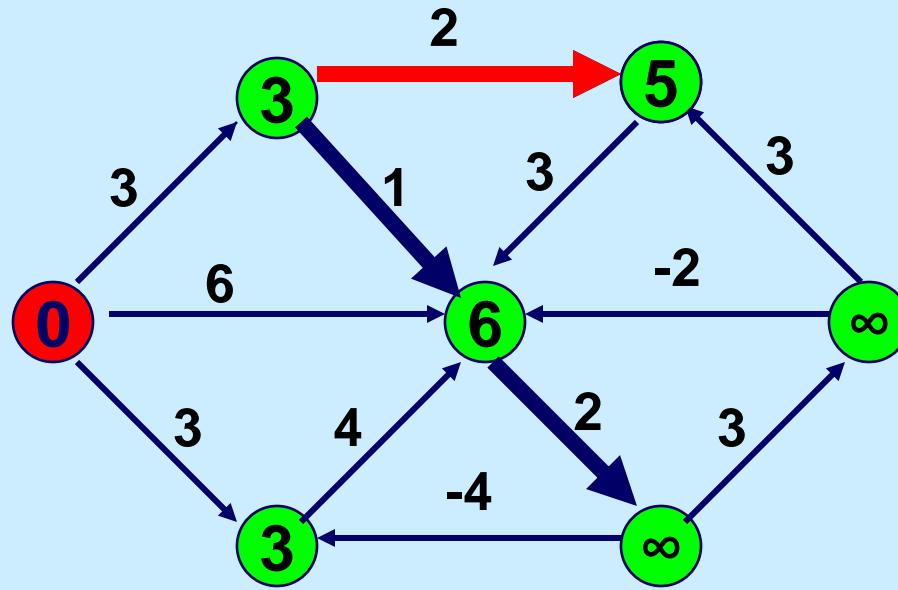
Pick a violating arc  $(i,j)$  and replace  $d(j)$  by  $d(i) + c_{ij}$ .



Generic Step

An arc  $(i,j)$  is **violating** if  $d(j) > d(i) + c_{ij}$ .

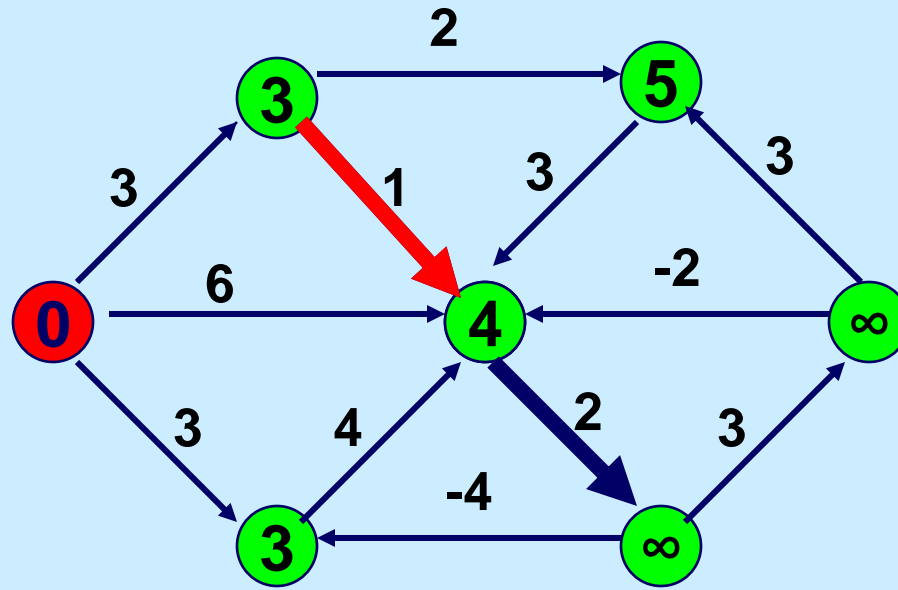
Pick a violating arc  $(i,j)$  and replace  $d(j)$  by  $d(i) + c_{ij}$ .



## Generic Step

An arc  $(i,j)$  is **violating** if  $d(j) > d(i) + c_{ij}$ .

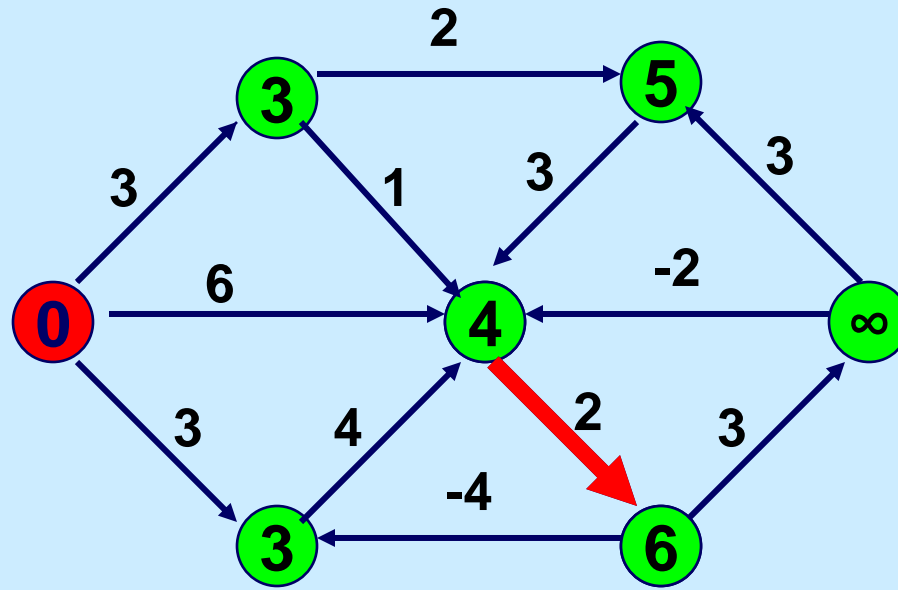
Pick a violating arc  $(i,j)$  and replace  $d(j)$  by  $d(i) + c_{ij}$ .



## Generic Step

An arc  $(i,j)$  is **violating** if  $d(j) > d(i) + c_{ij}$ .

Pick a violating arc  $(i,j)$  and replace  $d(j)$  by  $d(i) + c_{ij}$ .

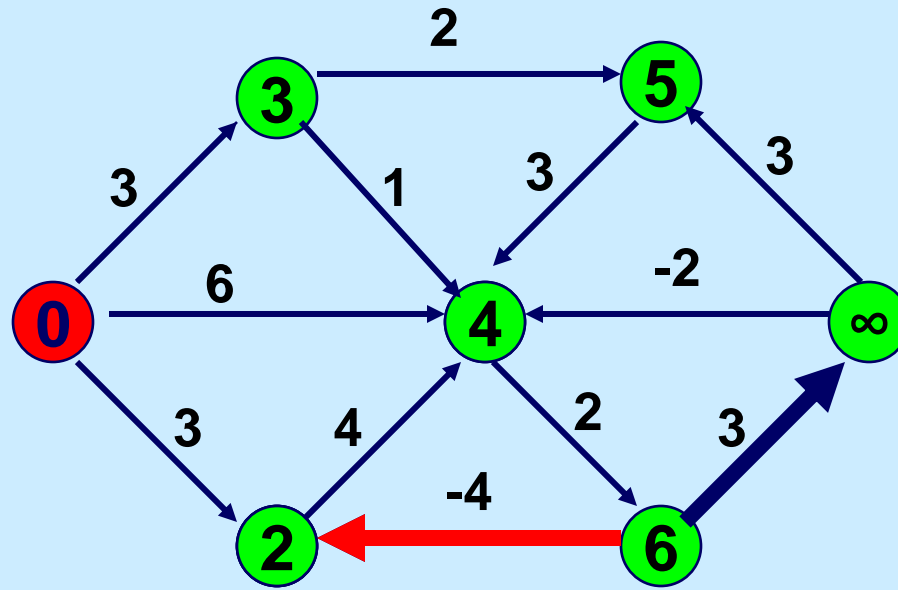


## Generic Step

An arc  $(i,j)$  is **violating** if  $d(j) > d(i) + c_{ij}$ .

Pick a violating arc  $(i,j)$  and replace  $d(j)$  by  $d(i) + c_{ij}$ .

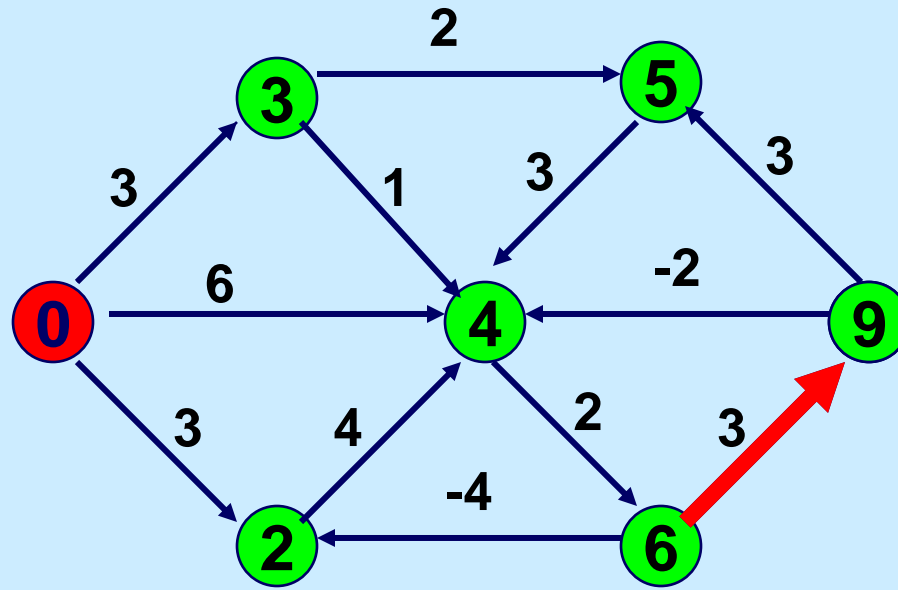




## Generic Step

An arc  $(i,j)$  is **violating** if  $d(j) > d(i) + c_{ij}$ .

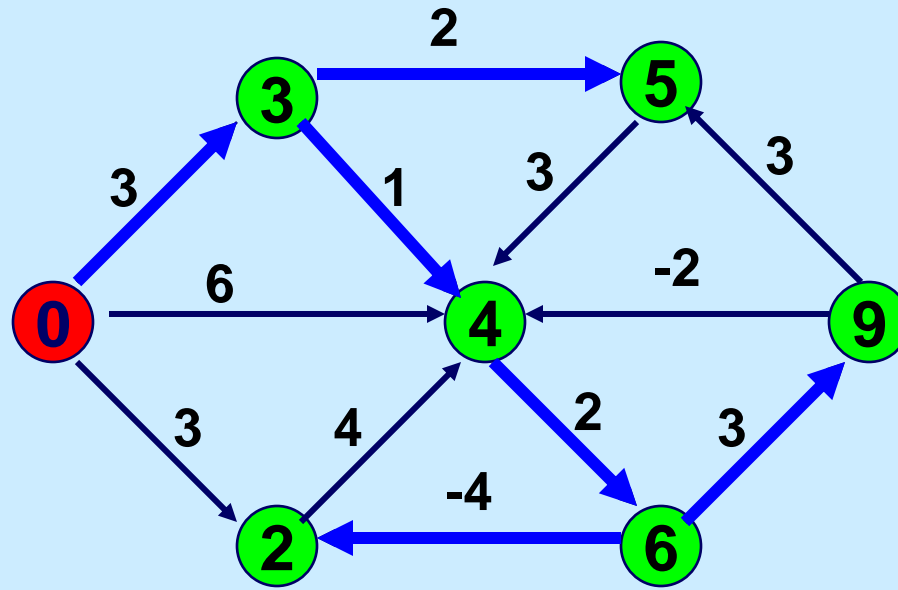
Pick a violating arc  $(i,j)$  and replace  $d(j)$  by  $d(i) + c_{ij}$ .



## Generic Step

An arc  $(i,j)$  is **violating** if  $d(j) > d(i) + c_{ij}$ .

Pick a violating arc  $(i,j)$  and replace  $d(j)$  by  $d(i) + c_{ij}$ .



Generic Step

An arc  $(i,j)$  is **violating** if  $d(j) > d(i) + c_{ij}$ .

Pick a violating arc  $(i,j)$  and replace  $d(j)$  by  $d(i) + c_{ij}$ .

No arc is violating

The distance labels are optimal

We now show the predecessor arcs.

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15.082J / 6.855J / ESD.78J Network Optimization  
Fall 2010

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