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**15.082 and 6.855J**

**Modified Label Correcting Algorithm**

# The Modified Label Correcting Algorithm

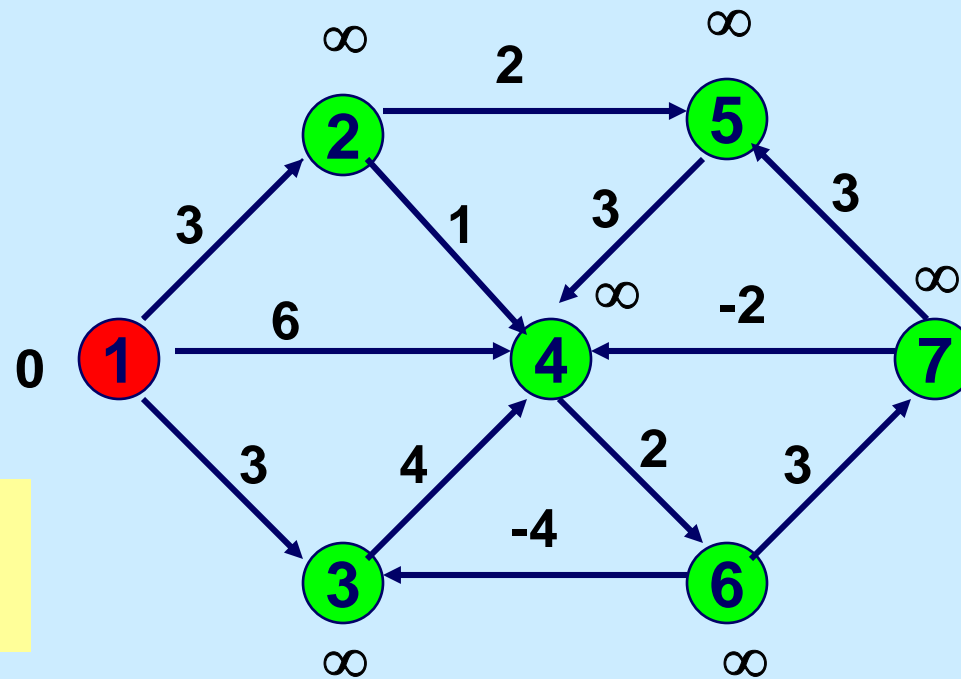
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**Initialize**

$d(1) := 0;$

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

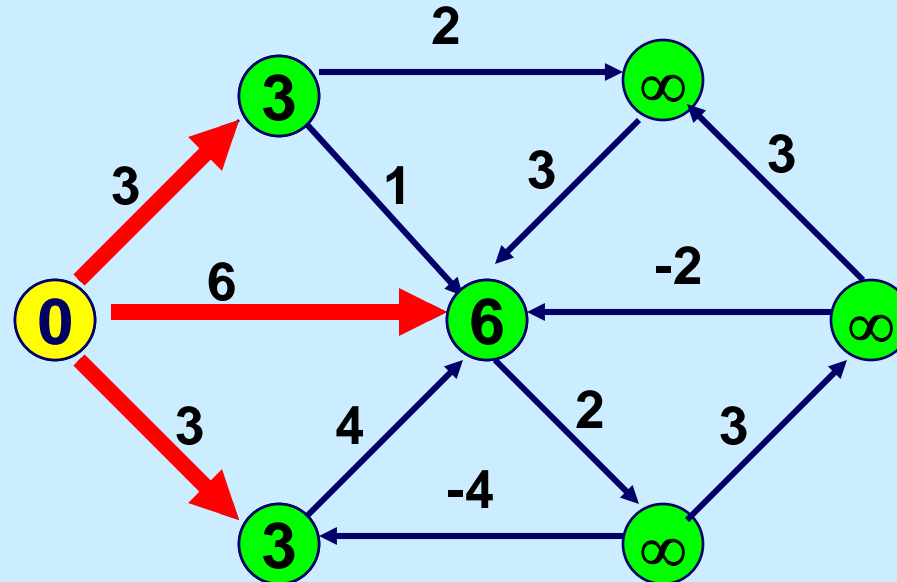
**LIST := {1}**



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

# An Example

**LIST := { 2, 3, 4 }**



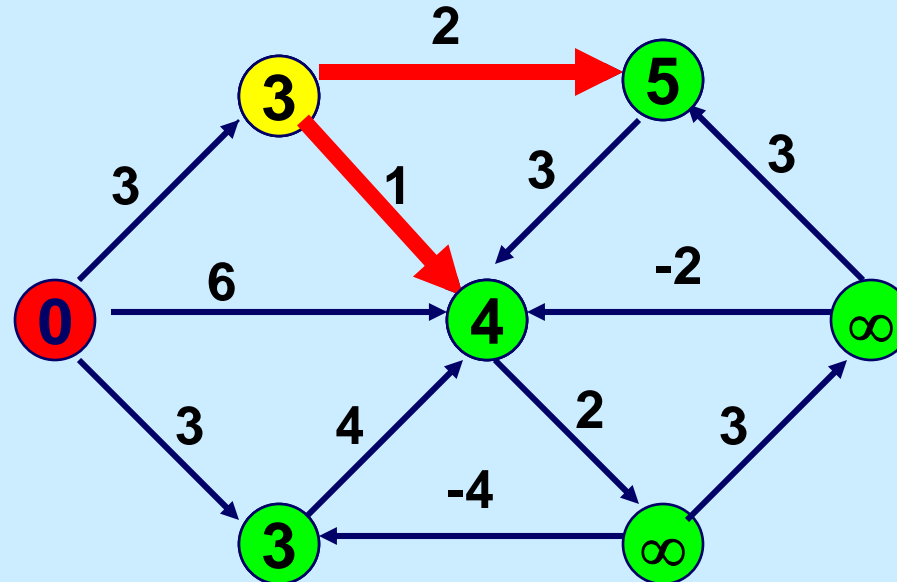
**Generic Step**

**Take a node  $i$   
from LIST**

**Update( $i$ ): for each arc  $(i,j)$  with  $d(j) > d(i) + c_{ij}$   
replace  $d(j)$  by  $d(i) + c_{ij}$ .**

# An Example

**LIST := { 3, 4, 5 }**

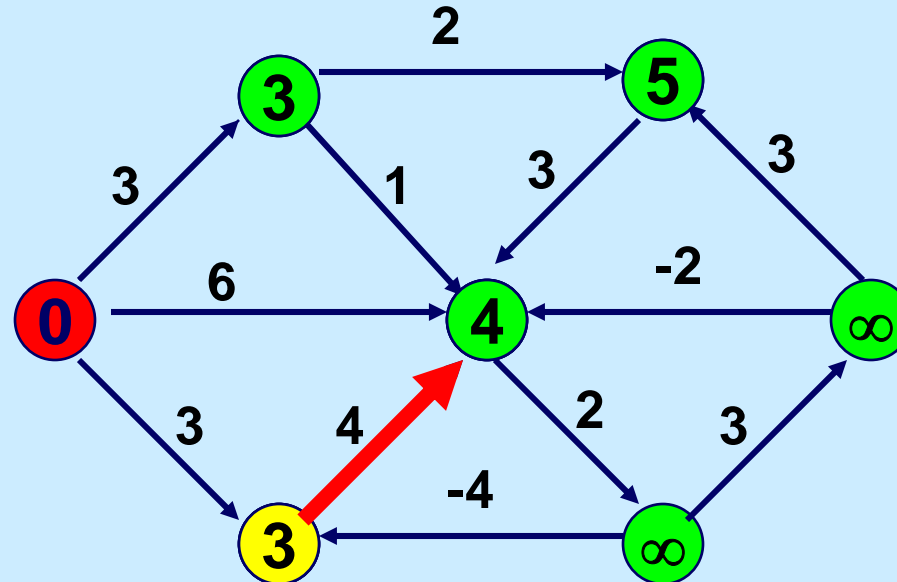


Take a node  $i$   
from LIST

Update( $i$ ): for each arc  $(i,j)$  with  $d(j) > d(i) + c_{ij}$   
replace  $d(j)$  by  $d(i) + c_{ij}$ .

# An Example

**LIST := { 4, 5 }**

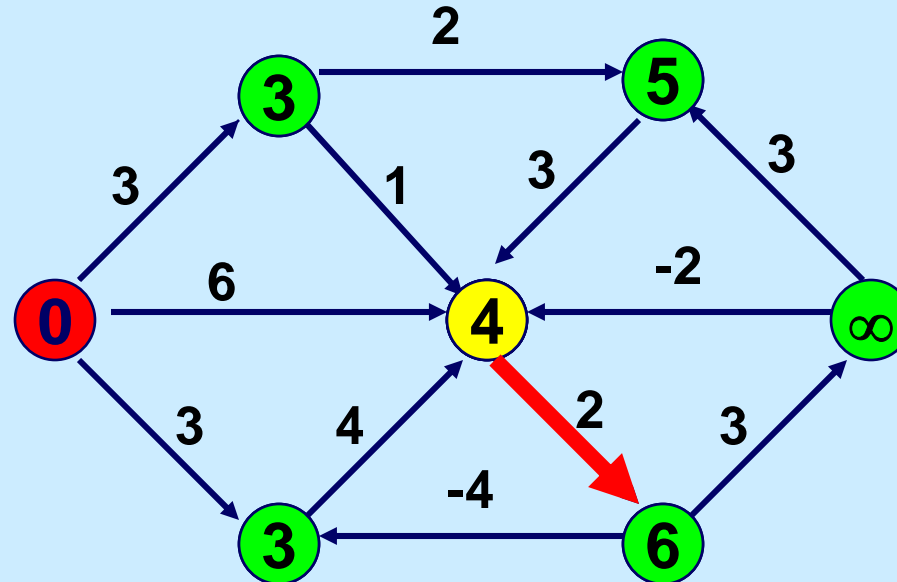


**Take a node  $i$   
from LIST**

**Update( $i$ ): for each arc  $(i,j)$  with  $d(j) > d(i) + c_{ij}$   
replace  $d(j)$  by  $d(i) + c_{ij}$ .**

# An Example

**LIST := { 5, 6 }**

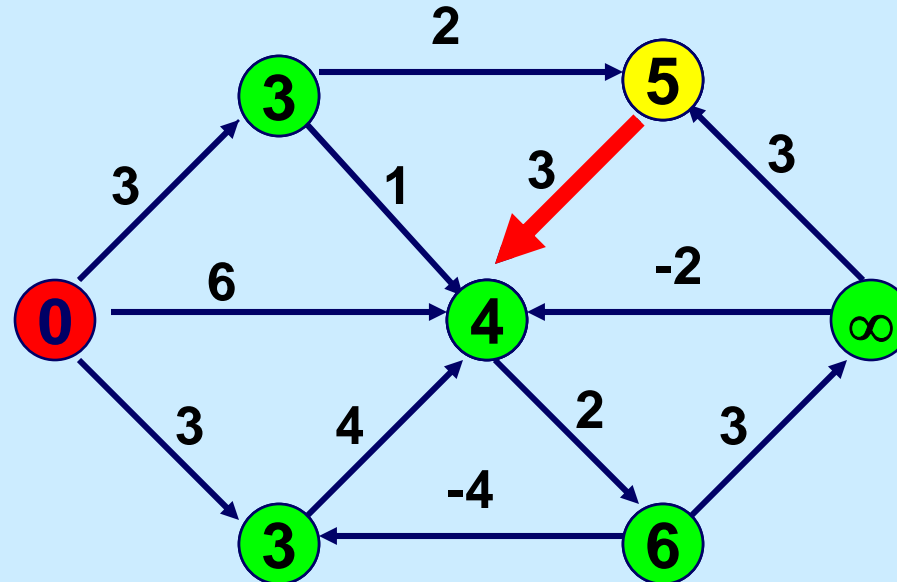


**Take a node  $i$   
from LIST**

**Update( $i$ ): for each arc  $(i,j)$  with  $d(j) > d(i) + c_{ij}$   
replace  $d(j)$  by  $d(i) + c_{ij}$ .**

# An Example

**LIST := { 6 }**

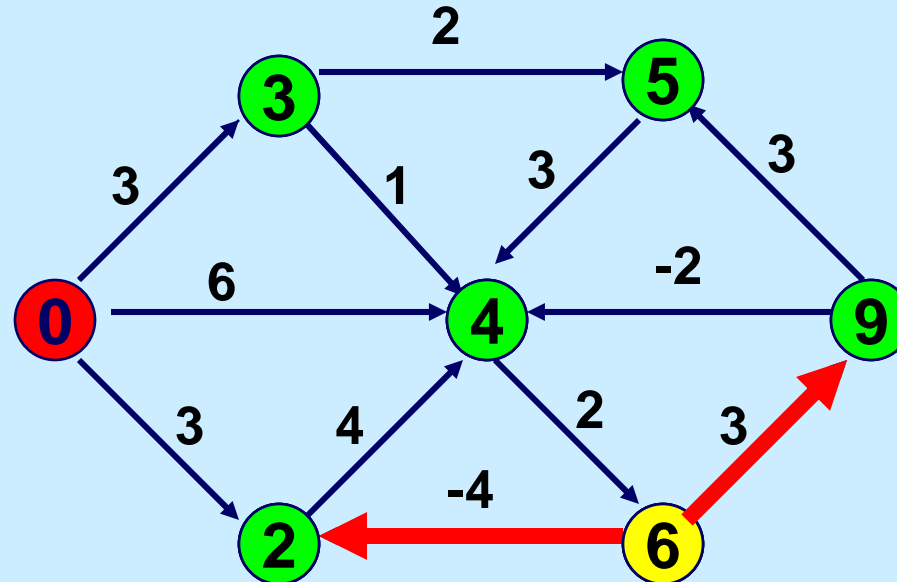


**Take a node  $i$   
from LIST**

**Update( $i$ ): for each arc  $(i,j)$  with  $d(j) > d(i) + c_{ij}$   
replace  $d(j)$  by  $d(i) + c_{ij}$ .**

# An Example

**LIST := { 3, 7 }**

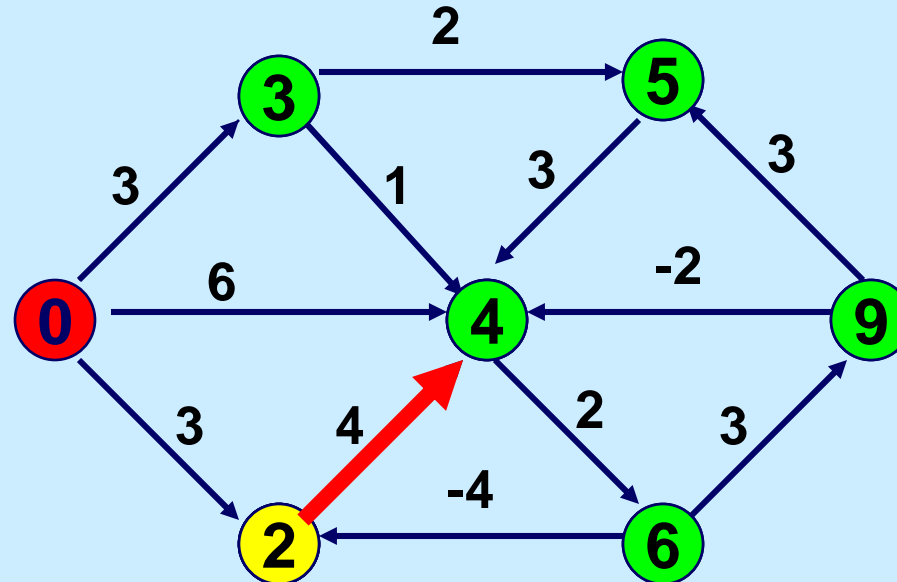


**Take a node  $i$   
from LIST**

**Update( $i$ ): for each arc  $(i,j)$  with  $d(j) > d(i) + c_{ij}$   
replace  $d(j)$  by  $d(i) + c_{ij}$ .**

# An Example

**LIST := { 7 }**

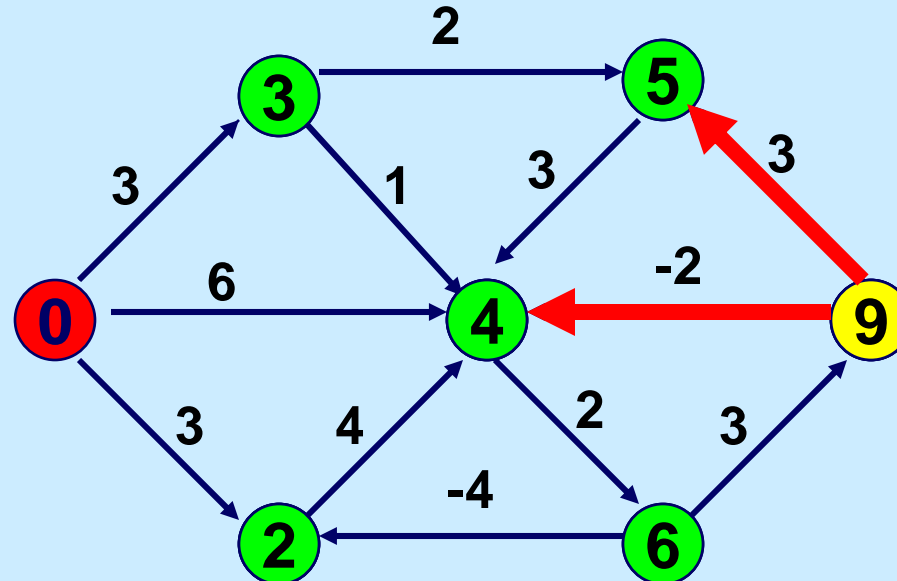


**Take a node  $i$   
from LIST**

**Update( $i$ ): for each arc  $(i,j)$  with  $d(j) > d(i) + c_{ij}$   
replace  $d(j)$  by  $d(i) + c_{ij}$ .**

# An Example

**LIST := {}**

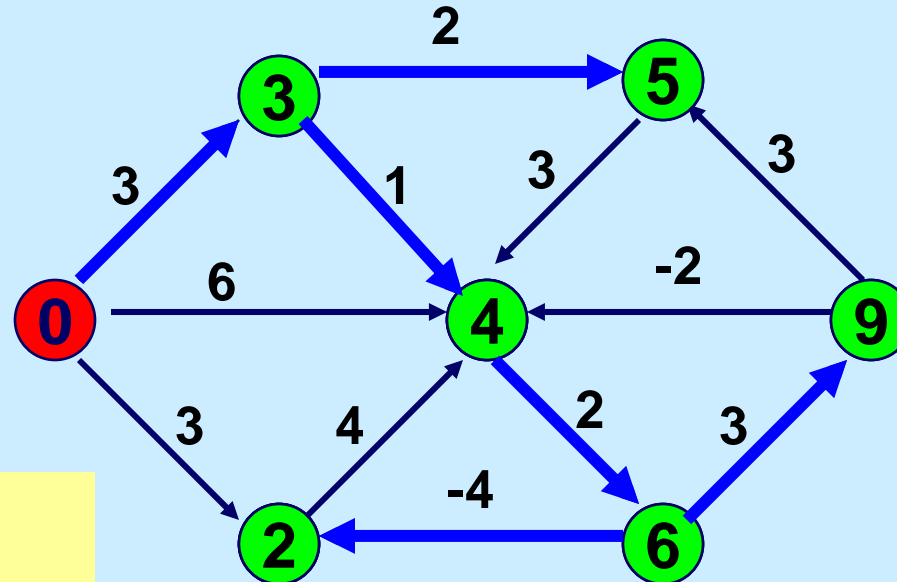


**Take a node  $i$   
from LIST**

**Update( $i$ ): for each arc  $(i,j)$  with  $d(j) > d(i) + c_{ij}$   
replace  $d(j)$  by  $d(i) + c_{ij}$ .**

# An Example

**LIST := {}**



**LIST is empty.**

**The distance labels  
are optimal**

**Here are the predecessors**