

Depth-First Search Algorithm

```

dfs ( a )
a.marked ← 1
print a
for each ( a, u ) ∈ E
  if ( u.mark != 1 )
    dfs ( u )
    
```

dfs("a")
....

a	b	d	c
b	a	d	
c	a		
d	e	b	a
e	d		

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Depth-First Search Algorithm

```

dfs ( a )
a.marked ← 1
print a
for each ( a, u ) ∈ E
  if ( b.mark != 1 )
    dfs ( b )
    
```

dfs("a")
.... dfs("b")
....

$u=b$

a	b	d	c
b	a	d	
c	a		
d	e	b	a
e	d		

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Depth-First Search Algorithm

```

dfs ( b )
b.marked ← 1
print b
for each ( b, u ) ∈ E
  if ( u.mark != 1 )
    dfs ( u )
    
```

dfs("a")
.... dfs("b")
....

a	b	d	c
b	a	d	
c	a		
d	e	b	a
e	d		

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Depth-First Search Algorithm

```

dfs ( b )
b.marked ← 1
print b
for each ( b, u ) ∈ E
  if ( a.mark != 1 )
    dfs ( a )
    
```

dfs("a")
.... dfs("b")
....

$u=a$

a	b	d	c
b	a	d	
c	a		
d	e	b	a
e	d		

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Depth-First Search Algorithm

```

dfs ( b )
b.marked ← 1
print b
for each ( b, u ) ∈ E
  if ( d.mark != 1 )
    dfs ( d )
    
```

dfs("a")
.... dfs("b")
.... dfs("d")
....

$u=d$

a	b	d	c
b	a	d	
c	a		
d	e	b	a
e	d		

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Depth-First Search Algorithm

```

dfs ( d )
d.marked ← 1
print d
for each ( d, u ) ∈ E
  if ( u.mark != 1 )
    dfs ( u )
    
```

dfs("a")
.... dfs("b")
.... dfs("d")
....

a	b	d	c
b	a	d	
c	a		
d	e	b	a
e	d		

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Depth-First Search Algorithm

```

dfs ( d )
d.marked ← 1
print d
for each ( d, u ) ∈ E
if ( e.mark != 1 )
dfs ( e )
    
```

a b d

a	·	b	→	d	→	c	⊗
b	·	a	→	d	⊗		
c	·	a	⊗				
d	·	e	→	b	→	a	⊗
e	·	d	⊗				

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Depth-First Search Algorithm

```

dfs ( e )
e.marked ← 1
print e
for each ( e, u ) ∈ E
if ( u.mark != 1 )
dfs ( u )
    
```

a b d e

a	·	b	→	d	→	c	⊗
b	·	a	→	d	⊗		
c	·	a	⊗				
d	·	e	→	b	→	a	⊗
e	·	d	⊗				

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Depth-First Search Algorithm

```

dfs ( e )
e.marked ← 1
print e
for each ( e, u ) ∈ E
if ( d.mark != 1 )
dfs ( u )
    
```

a b d e

a	·	b	→	d	→	c	⊗
b	·	a	→	d	⊗		
c	·	a	⊗				
d	·	e	→	b	→	a	⊗
e	·	d	⊗				

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Depth-First Search Algorithm

```

dfs ( e )
e.marked ← 1
print e
for each ( e, u ) ∈ E
if ( u.mark != 1 )
dfs ( u )
    
```

a b d e

a	·	b	→	d	→	c	⊗
b	·	a	→	d	⊗		
c	·	a	⊗				
d	·	e	→	b	→	a	⊗
e	·	d	⊗				

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Depth-First Search Algorithm

```

dfs ( d )
d.marked ← 1
print d
for each ( d, u ) ∈ E
if ( b.mark != 1 )
dfs ( b )
    
```

a b d e

a	·	b	→	d	→	c	⊗
b	·	a	→	d	⊗		
c	·	a	⊗				
d	·	e	→	b	→	a	⊗
e	·	d	⊗				

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Depth-First Search Algorithm

```

dfs ( d )
d.marked ← 1
print d
for each ( d, u ) ∈ E
if ( u.mark != 1 )
dfs ( u )
    
```

a b d e

a	·	b	→	d	→	c	⊗
b	·	a	→	d	⊗		
c	·	a	⊗				
d	·	e	→	b	→	a	⊗
e	·	d	⊗				

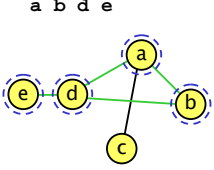
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Depth-First Search Algorithm

```

dfs ( b )
b.marked ← 1
print b
for each ( b, u ) ∈ E
  if ( u.mark != 1 )
    dfs ( u )
    
```

dfs("a")
 ... dfs("b")
 ...



a	-	b	-	d	-	c	⊗
b	-	a	-	d	⊗		
c	-	a	⊗				
d	-	e	-	b	-	a	⊗
e	-	d	⊗				

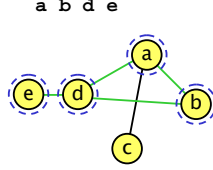
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Depth-First Search Algorithm

```

dfs ( a )
a.marked ← 1
print a
for each ( a, u ) ∈ E
  if ( d.mark != 1 )
    dfs ( d )
    
```

dfs("a")
 ...



a	-	b	-	d	-	c	⊗
b	-	a	-	d	⊗		
c	-	a	⊗				
d	-	e	-	b	-	a	⊗
e	-	d	⊗				

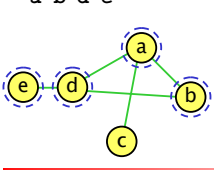
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Depth-First Search Algorithm

```

dfs ( a )
a.marked ← 1
print a
for each ( a, u ) ∈ E
  if ( c.mark != 1 )
    dfs ( c )
    
```

dfs("a")
 ... dfs("c")
 ...



a	-	b	-	d	-	c	⊗
b	-	a	-	d	⊗		
c	-	a	⊗				
d	-	e	-	b	-	a	⊗
e	-	d	⊗				

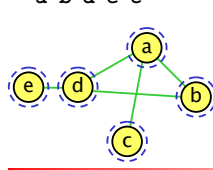
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Depth-First Search Algorithm

```

dfs ( c )
c.marked ← 1
print c
for each ( c, u ) ∈ E
  if ( u.mark != 1 )
    dfs ( u )
    
```

dfs("a")
 ... dfs("c")
 ...



a	-	b	-	d	-	c	⊗
b	-	a	-	d	⊗		
c	-	a	⊗				
d	-	e	-	b	-	a	⊗
e	-	d	⊗				

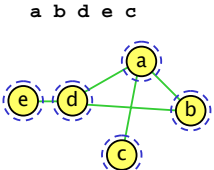
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Depth-First Search Algorithm

```

dfs ( c )
c.marked ← 1
print c
for each ( c, u ) ∈ E
  if ( a.mark != 1 )
    dfs ( a )
    
```

dfs("a")
 ... dfs("c")
 ...



a	-	b	-	d	-	c	⊗
b	-	a	-	d	⊗		
c	-	a	⊗				
d	-	e	-	b	-	a	⊗
e	-	d	⊗				

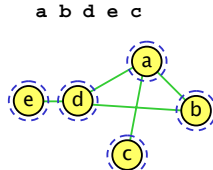
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Depth-First Search Algorithm

```

dfs ( c )
c.marked ← 1
print c
for each ( c, u ) ∈ E
  if ( u.mark != 1 )
    dfs ( u )
    
```

dfs("a")
 ... dfs("c")
 ...



a	-	b	-	d	-	c	⊗
b	-	a	-	d	⊗		
c	-	a	⊗				
d	-	e	-	b	-	a	⊗
e	-	d	⊗				

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Depth-First Search Algorithm

```

dfs(a)
  a.marked ← 1
  print a
  for each (a, u) ∈ E
    if (u.mark != 1)
      dfs(u)
    
```

a b d e c

dfs("a")

...

a	b	d	e
b	d	e	
d	e		
e			

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Dijkstra's Algorithm - an example

Edges examined

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Dijkstra's Algorithm - an example

λ updated, min picked

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Dijkstra's Algorithm - an example

S Augmented

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Dijkstra's Algorithm - an example

Edges examined

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Dijkstra's Algorithm - an example

λ updated, min picked

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