## Plain `algo` and code

title: "Floyd-Warshall" (algo only)
parameters: ("V", "E", "w") (algo only)

```
FLOYD-WARSHALL(V, E, w):
    Let dist[u, v] ← ∞ for u, v in V
    For (u, v) in E:
        dist[u, v] ← w(u, v)                    // edge weights
    For v in V:
        dist[v, v] ← 0                          // base case

    For k ← 1 to |V|:
        For i ← 1 to |V|:
            For j ← 1 to |V|:
                // if new path is shorter, reduce distance
                If dist[i, j] > dist[i, k] + dist[k, j]:
                    dist[i, j] ← dist[i, k] + dist[k, j]

    Return dist
```

```python
def floyd_warshall(G):
  # let G be an adjacency matrix
  dist = G

  for k in range(len(G)):
    for i in range(len(G)):
      for j in range(len(G)):
        if dist[i][j] > dist[i][k] + dist[k][j]:
          dist[i][j] = dist[i][k] + dist[k][j]

  return dist
```

## Basic styling parameters

| | |
|---|---|
| fill: | none |
| stroke: | 2pt + black |
| radius: | 10pt |
| row-gutter: | 8pt |
| column-gutter: | 8pt |
| inset: | 15pt |
| indent-size: | 12pt (algo only) |
| indent-guides: | 1pt + gray |
| indent-guides-offset: | 4pt |
| comment-prefix: | [#sym.triangle ] (algo only) |

**FLOYD-WARSHALL**$(V, E, w)$:

1 **Let** $\text{dist}[u, v] \leftarrow \infty$ **for** $u, v$ **in** $V$
2 **For** $(u, v)$ **in** $E$**:**
3 $\quad \text{dist}[u, v] \leftarrow w(u, v)$ ▷ edge weights
4 **For** $v$ **in** $V$**:**
5 $\quad \text{dist}[v, v] \leftarrow 0$ ▷ base case
6
7 **For** $k \leftarrow 1$ **to** $|V|$**:**
8 $\quad$ **For** $i \leftarrow 1$ **to** $|V|$**:**
9 $\quad\quad$ **For** $j \leftarrow 1$ **to** $|V|$**:**
10 $\quad\quad\quad$ ▷ if new path is shorter, reduce distance
11 $\quad\quad\quad$ **If** $\text{dist}[i, j] > \text{dist}[i, k] + \text{dist}[k, j]$**:**
12 $\quad\quad\quad\quad \text{dist}[i, j] \leftarrow \text{dist}[i, k] + \text{dist}[k, j]$
13
14 **Return** dist

```
1  def floyd_warshall(G):
2      # let G be an adjacency matrix
3      dist = G
4
5      for k in range(len(G)):
6          for i in range(len(G)):
7              for j in range(len(G)):
8                  if dist[i][j] > dist[i][k] + dist[k][j]:
9                      dist[i][j] = dist[i][k] + dist[k][j]
10
11     return dist
```

## Empty bodies

### `code` with empty raw text

### `code` with empty raw block

## code with non-sequence raw block

```
def floyd_warshall(G):
  # let G be an adjacency matrix
  dist = G

  for k in range(len(G)):
    for i in range(len(G)):
      for j in range(len(G)):
        if dist[i][j] > dist[i][k] + dist[k][j]:
          dist[i][j] = dist[i][k] + dist[k][j]

  return dist
```

## Indent guides with line wrapping

indent-guides: 1pt + black

```
FLOYD-WARSHALL(V, E, w):
Let dist[u, v] ← ∞ for u, v in V
For (u, v) in E:
    dist[u, v] ← w(u, v)                                    // edge weights
For v in V:
    dist[v, v] ← 0                                          // base case

For k ← 1 to |V|:
    For i ← 1 to |V|:
        For j ← 1 to |V|:
            // if new path is shorter, reduce distance
            If dist[i, j] > dist[i, k] + dist[k, j]:
                dist[i, j] ← dist[i, k] + dist[k, j]
                blah blah blah blah blah blah blah blah blah blah blah
                blah blah blah blah blah

Return dist
```

```
def floyd_warshall(G):
    # let G be an adjacency matrix
    dist = G

    for k in range(len(G)):
        for i in range(len(G)):
            for j in range(len(G)):
                if dist[i][j] > dist[i][k] + dist[k][j]:
                    dist[i][j] = dist[i][k] + dist[k][j]
                    blah blah blah blah blah blah blah blah blah blah blah blah blah blah
blah blah blah

```

## code indent guides with custom tab size

indent-guides: 1pt + black

tab-size: 2

```
def floyd_warshall(
    G
):
  # let G be an adjacency matrix
  dist = G

  for k in range(len(G)):
    for i in range(len(G)):
      for j in range(len(G)):
        if dist[i][j] > dist[i][k] + dist[k][j]:
          dist[i][j] = dist[i][k] + dist[k][j]

  return dist
```

## No line numbers

line-numbers: false

FLOYD-WARSHALL$(V, E, w)$:
**Let** $\text{dist}[u, v] \leftarrow \infty$ **for** $u, v$ **in** $V$
**For** $(u, v)$ **in** $E$:
    $\text{dist}[u, v] \leftarrow w(u, v)$ // edge weights
**For** $v$ **in** $V$:
    $\text{dist}[v, v] \leftarrow 0$ // base case

**For** $k \leftarrow 1$ **to** $|V|$:
    **For** $i \leftarrow 1$ **to** $|V|$:
        **For** $j \leftarrow 1$ **to** $|V|$:
            // if new path is shorter, reduce distance
            **If** $\text{dist}[i, j] > \text{dist}[i, k] + \text{dist}[k, j]$:
                $\text{dist}[i, j] \leftarrow \text{dist}[i, k] + \text{dist}[k, j]$

**Return** dist

```
def floyd_warshall(G):
  # let G be an adjacency matrix
  dist = G

  for k in range(len(G)):
    for i in range(len(G)):
      for j in range(len(G)):
        if dist[i][j] > dist[i][k] + dist[k][j]:
          dist[i][j] = dist[i][k] + dist[k][j]

  return dist
```

## `algo` without keywords

strong-keywords: false

```
FLOYD-WARSHALL(V, E, w):
Let dist[u, v] ← ∞ for u, v in V
For (u, v) in E:
    dist[u, v] ← w(u, v)                          // edge weights
For v in V:
    dist[v, v] ← 0                                // base case

For k ← 1 to |V|:
    For i ← 1 to |V|:
        For j ← 1 to |V|:
            // if new path is shorter, reduce distance
            If dist[i, j] > dist[i, k] + dist[k, j]:
                dist[i, j] ← dist[i, k] + dist[k, j]

Return dist
```

## `algo` with custom keywords

keywords: ("in", "to")

FLOYD-WARSHALL$(V, E, w)$:
1 Let $\text{dist}[u, v] \leftarrow \infty$ for $u, v$ **in** $V$
2 For $(u, v)$ **in** $E$:
3 $\quad \text{dist}[u, v] \leftarrow w(u, v)$ // edge weights
4 For $v$ **in** $V$:
5 $\quad \text{dist}[v, v] \leftarrow 0$ // base case
6
7 For $k \leftarrow 1$ **to** $|V|$:
8 $\quad$ For $i \leftarrow 1$ **to** $|V|$:
9 $\quad\quad$ For $j \leftarrow 1$ **to** $|V|$:
10 $\quad\quad\quad$ // if new path is shorter, reduce distance
11 $\quad\quad\quad$ If $\text{dist}[i, j] > \text{dist}[i, k] + \text{dist}[k, j]$:
12 $\quad\quad\quad\quad \text{dist}[i, j] \leftarrow \text{dist}[i, k] + \text{dist}[k, j]$
13
14 Return dist

### `algo` without title

title: none

```
(V, E, w):
    Let dist[u, v] ← ∞ for u, v in V
    For (u, v) in E:
        dist[u, v] ← w(u, v)                          // edge weights
    For v in V:
        dist[v, v] ← 0                                // base case

    For k ← 1 to |V|:
        For i ← 1 to |V|:
            For j ← 1 to |V|:
                // if new path is shorter, reduce distance
                If dist[i, j] > dist[i, k] + dist[k, j]:
                    dist[i, j] ← dist[i, k] + dist[k, j]

    Return dist
```

## `algo` without parameters

parameters: ()

```
FLOYD-WARSHALL():
Let dist[u, v] ← ∞ for u, v in V
For (u, v) in E:
    dist[u, v] ← w(u, v)                          // edge weights
For v in V:
    dist[v, v] ← 0                                // base case

For k ← 1 to |V|:
    For i ← 1 to |V|:
        For j ← 1 to |V|:
            // if new path is shorter, reduce distance
            If dist[i, j] > dist[i, k] + dist[k, j]:
                dist[i, j] ← dist[i, k] + dist[k, j]

Return dist
```

## `algo` without header

title: none

parameters: ()

```
Let dist[u, v] ← ∞ for u, v in V
For (u, v) in E:
    dist[u, v] ← w(u, v)                          // edge weights
For v in V:
    dist[v, v] ← 0                                // base case

For k ← 1 to |V|:
    For i ← 1 to |V|:
        For j ← 1 to |V|:
            // if new path is shorter, reduce distance
            If dist[i, j] > dist[i, k] + dist[k, j]:
                dist[i, j] ← dist[i, k] + dist[k, j]

Return dist
```

## `algo` with content-type parameters

parameters: ([#text(blue, [V])], [#text(red, [E])], [#text(green, [w])])

FLOYD-WARSHALL(V, E, w):

```
Let dist[u, v] ← ∞ for u, v in V
For (u, v) in E:
    dist[u, v] ← w(u, v)                    // edge weights
For v in V:
    dist[v, v] ← 0                          // base case

For k ← 1 to |V|:
    For i ← 1 to |V|:
        For j ← 1 to |V|:
            // if new path is shorter, reduce distance
            If dist[i, j] > dist[i, k] + dist[k, j]:
                dist[i, j] ← dist[i, k] + dist[k, j]

Return dist
```

### `algo` with content-type title

title: [#set text(red);Floyd-Warshall]

Floyd-Warshall():

**Let** $\text{dist}[u, v] \leftarrow \infty$ **for** $u, v$ **in** $V$
**For** $(u, v)$ **in** $E$**:**
    $\text{dist}[u, v] \leftarrow w(u, v)$ // edge weights
**For** $v$ **in** $V$**:**
    $\text{dist}[v, v] \leftarrow 0$ // base case

**For** $k \leftarrow 1$ **to** $|V|$**:**
    **For** $i \leftarrow 1$ **to** $|V|$**:**
        **For** $j \leftarrow 1$ **to** $|V|$**:**
            // if new path is shorter, reduce distance
            **If** $\text{dist}[i, j] > \text{dist}[i, k] + \text{dist}[k, j]$**:**
                $\text{dist}[i, j] \leftarrow \text{dist}[i, k] + \text{dist}[k, j]$

**Return** dist

## `algo` with custom header

**Floyd-Warshall Algorithm**

**Inputs:** graph $G = (V, E)$
weight function $w : E \to \mathbb{R}$

**Outputs:** distance matrix dist

---

**Let** $\text{dist}[u, v] \leftarrow \infty$ **for** $u, v$ **in** $V$
**For** $(u, v)$ **in** $E$**:**
    $\text{dist}[u, v] \leftarrow w(u, v)$ // edge weights
**For** $v$ **in** $V$**:**
    $\text{dist}[v, v] \leftarrow 0$ // base case

**For** $k \leftarrow 1$ **to** $|V|$**:**
    **For** $i \leftarrow 1$ **to** $|V|$**:**
        **For** $j \leftarrow 1$ **to** $|V|$**:**
            // if new path is shorter, reduce distance
            **If** $\text{dist}[i, j] > \text{dist}[i, k] + \text{dist}[k, j]$**:**
                $\text{dist}[i, j] \leftarrow \text{dist}[i, k] + \text{dist}[k, j]$

**Return** dist

## Text styling

main-text-styles: (fill: green)
line-number-styles: (fill: red)
comment-styles: (fill: blue) (algo only)

```
FLOYD-WARSHALL(V, E, w):
1  Let dist[u, v] ← ∞ for u, v in V
2  For (u, v) in E:
3      dist[u, v] ← w(u, v)                          // edge weights
4  For v in V:
5      dist[v, v] ← 0                                // base case
6
7  For k ← 1 to |V|:
8      For i ← 1 to |V|:
9          For j ← 1 to |V|:
10             // if new path is shorter, reduce distance
11             If dist[i, j] > dist[i, k] + dist[k, j]:
12                 dist[i, j] ← dist[i, k] + dist[k, j]
13
14 Return dist
```

```python
def floyd_warshall(G):
  # let G be an adjacency matrix
  dist = G

  for k in range(len(G)):
    for i in range(len(G)):
      for j in range(len(G)):
        if dist[i][j] > dist[i][k] + dist[k][j]:
          dist[i][j] = dist[i][k] + dist[k][j]

  return dist
```

### Indent guides with big main text

indent-guides: 1pt + black
main-text-styles: (size: 15pt)

FLOYD-WARSHALL$(V, E, w)$:

```
1  Let dist[u, v] ← ∞ for u, v in V
2  For (u, v) in E:
3  |   dist[u, v] ← w(u, v)                    // edge weights
4  For v in V:
5  |   dist[v, v] ← 0                          // base case
6
7  For k ← 1 to |V|:
8  |   For i ← 1 to |V|:
9  |   |   For j ← 1 to |V|:
10 |   |   |   // if new path is shorter, reduce distance
11 |   |   |   If dist[i, j] > dist[i, k] + dist[k, j]:
12 |   |   |   |   dist[i, j] ← dist[i, k] + dist[k, j]
13
14 Return dist
```

```python
def floyd_warshall(G):
    # let G be an adjacency matrix
    dist = G

    for k in range(len(G)):
        for i in range(len(G)):
            for j in range(len(G)):
                if dist[i][j] > dist[i][k] + dist[k][j]:
                    dist[i][j] = dist[i][k] + dist[k][j]

    return dist
```

## Indent guides with big line numbers

indent-guides: 1pt + black

line-number-styles: (size: 15pt)

```
FLOYD-WARSHALL(V, E, w):
    Let dist[u, v] ← ∞ for u, v in V
    For (u, v) in E:
        dist[u, v] ← w(u, v)                    // edge weights
    For v in V:
        dist[v, v] ← 0                          // base case

    For k ← 1 to |V|:
        For i ← 1 to |V|:
            For j ← 1 to |V|:
                // if new path is shorter, reduce distance
                If dist[i, j] > dist[i, k] + dist[k, j]:
                    dist[i, j] ← dist[i, k] + dist[k, j]

    Return dist
```

```python
def floyd_warshall(G):
    # let G be an adjacency matrix
    dist = G

    for k in range(len(G)):
        for i in range(len(G)):
            for j in range(len(G)):
                if dist[i][j] > dist[i][k] + dist[k][j]:
                    dist[i][j] = dist[i][k] + dist[k][j]

    return dist
```

### `algo` indent guides with big comments

indent-guides: 1pt + black
comment-styles: (size: 15pt)

```
FLOYD-WARSHALL(V, E, w):
Let dist[u, v] ← ∞ for u, v in V
For (u, v) in E:
    dist[u, v] ← w(u, v)                          // edge weights
For v in V:
    dist[v, v] ← 0                                // base case

For k ← 1 to |V|:
    For i ← 1 to |V|:
        For j ← 1 to |V|:
            // if new path is shorter, reduce distance
            If dist[i, j] > dist[i, k] + dist[k, j]:
                dist[i, j] ← dist[i, k] + dist[k, j]

Return dist
```

## Alignment

indent-guides: 1pt + black
block-align: bottom + right

FLOYD-WARSHALL$(V, E, w)$:

```
1  Let dist[u, v] ← ∞ for u, v in V
2  For (u, v) in E:
3  |   dist[u, v] ← w(u, v)                    // edge weights
4  For v in V:
5  |   dist[v, v] ← 0                          // base case
6
7  For k ← 1 to |V|:
8  |   For i ← 1 to |V|:
9  |   |   For j ← 1 to |V|:
10 |   |   |   // if new path is shorter, reduce distance
11 |   |   |   If dist[i, j] > dist[i, k] + dist[k, j]:
12 |   |   |   |   dist[i, j] ← dist[i, k] + dist[k, j]
13
14 Return dist
```

```python
def floyd_warshall(G):
    # let G be an adjacency matrix
    dist = G

    for k in range(len(G)):
        for i in range(len(G)):
            for j in range(len(G)):
                if dist[i][j] > dist[i][k] + dist[k][j]:
                    dist[i][j] = dist[i][k] + dist[k][j]

    return dist
```

## Breakable

indent-guides: 1pt + black
breakable: true

```
FLOYD-WARSHALL(V, E, w):
    Let dist[u, v] ← ∞ for u, v in V
    For (u, v) in E:
    |   dist[u, v] ← w(u, v)                    // edge weights
    For v in V:
    |   dist[v, v] ← 0                          // base case
    
    For k ← 1 to |V|:
    |   For i ← 1 to |V|:
    |   |   For j ← 1 to |V|:
```

```
        // if new path is shorter, reduce distance
        If dist[i, j] > dist[i, k] + dist[k, j]:
            dist[i, j] ← dist[i, k] + dist[k, j]

Return dist
```

```python
def floyd_warshall(G):
    # let G be an adjacency matrix
    dist = G

    for k in range(len(G)):
        for i in range(len(G)):
            for j in range(len(G)):
```

```
                if dist[i][j] > dist[i][k] + dist[k][j]:
                    dist[i][j] = dist[i][k] + dist[k][j]

    return dist
```

## Broken indent guides with small inset

row-gutter: 15pt
inset: 3pt
indent-guides: 1pt + black
breakable: true

```
Floyd-Warshall(V, E, w):
Let dist[u, v] ← ∞ for u, v in V
For (u, v) in E:
    dist[u, v] ← w(u, v)                    // edge weights
For v in V:
    dist[v, v] ← 0                          // base case

For k ← 1 to |V|:
    For i ← 1 to |V|:
        For j ← 1 to |V|:
```

```
        // if new path is shorter, reduce distance
        If dist[i, j] > dist[i, k] + dist[k, j]:
            dist[i, j] ← dist[i, k] + dist[k, j]

Return dist
```

```python
def floyd_warshall(G):
    # let G be an adjacency matrix
    dist = G

    for k in range(len(G)):
        for i in range(len(G)):
            for j in range(len(G)):
```

```
                if dist[i][j] > dist[i][k] + dist[k][j]:
                    dist[i][j] = dist[i][k] + dist[k][j]

    return dist
```