

# D04 Procedural vs Denotative Style

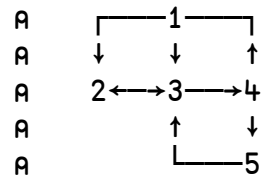
A Procedural vs denotative styles

A Different mindsets - both have their place

A Procedural: aware of sequence

A Denotative: atemporal definitions

A Example: find the shortest path through a graph (network)



$g \leftarrow (2\ 3)(3)(2\ 4)(1\ 5)(3)$

A directed graph

g pathP 2 1

A single vertex to vertex path

2 3 4 1

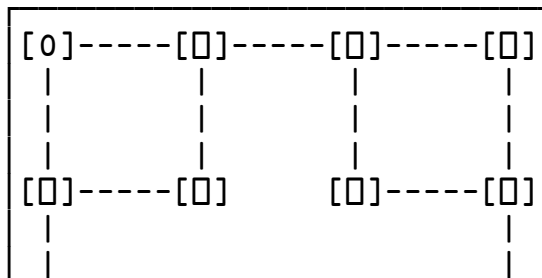
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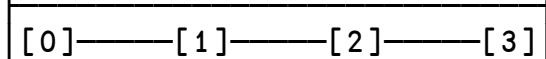
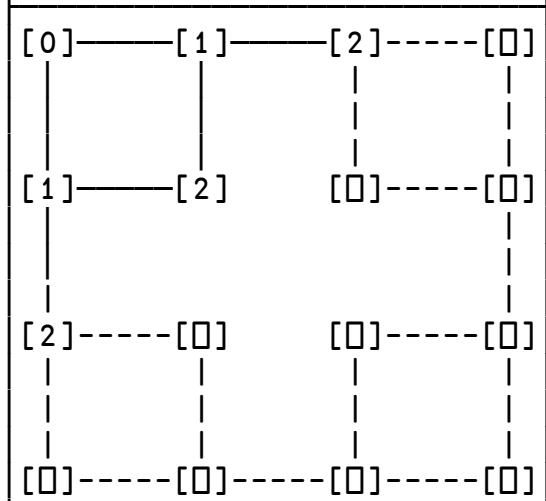
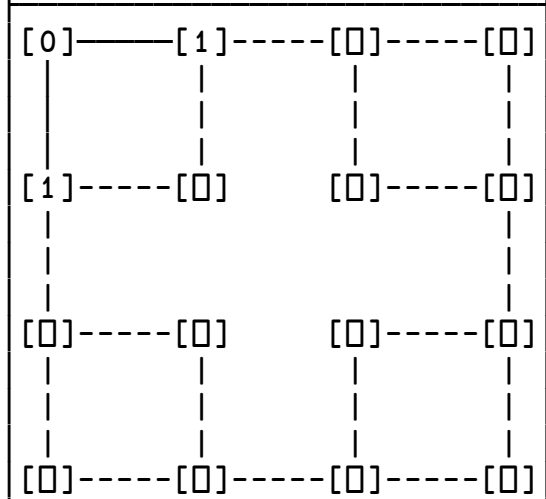
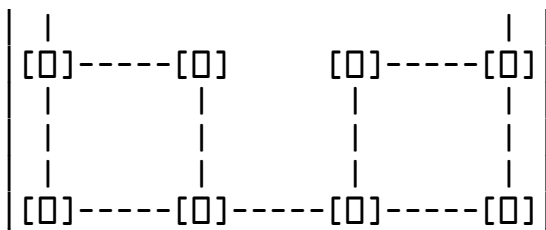
A parallel breadth-first search

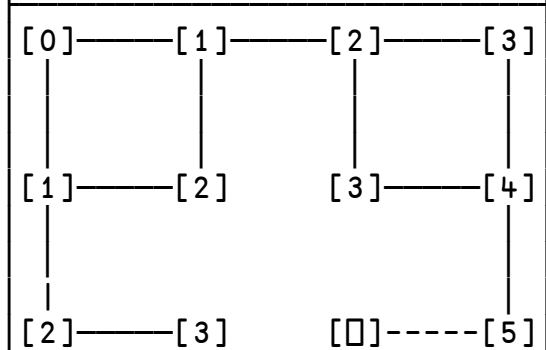
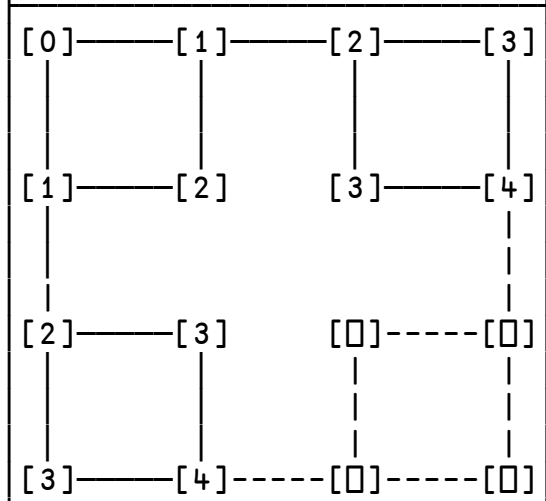
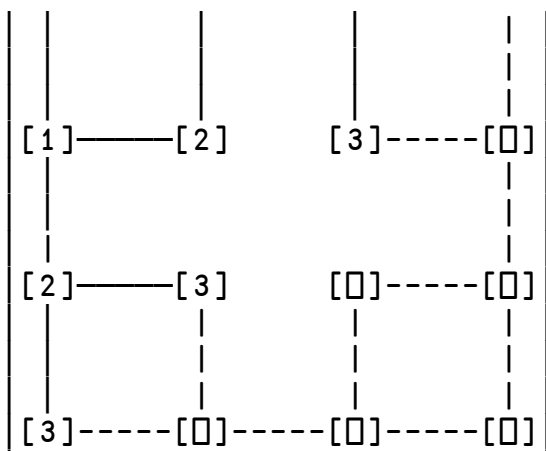
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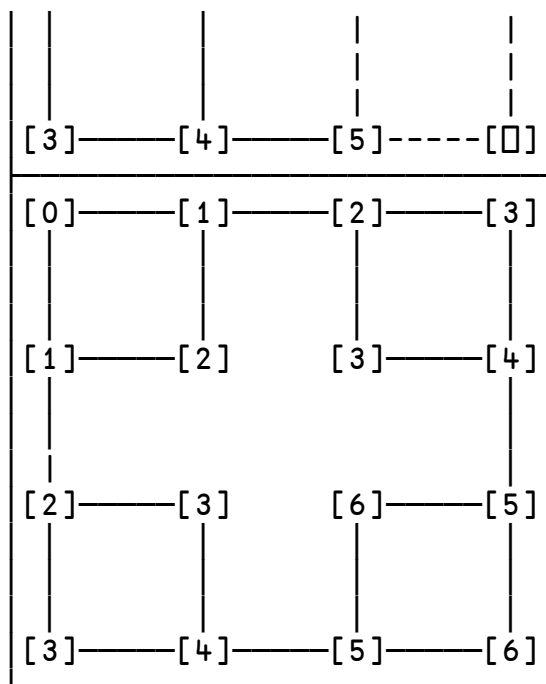
A parallel breadth-first search

⌘ggg









```

    pathP
  {
    fm to←ω
    tree←-2+(ιρα)∈fm
    free←α{αα[ω]n..cια=-2}
    {
      ω≡θ:θ
      v/to∈ω:θ{
        ω<0:α
        (ω,α)∇ ω>tree
      }1↑ωnto
      next←tree free ω
      back←⇒,/ω+0×next
      wave←⇒,/next
      tree[wave]←back
      ∇∪wave
    }fm
  }

    pathD
  {
    fm to←ω
    tree←-2+(ιρα)∈fm
    free←α{αα[ω]n..cια=-2}
    tree{
      ω≡θ:θ
      v/to∈ω:θ(>◦α){
        ω<0:α
        (ω,α)∇ αα ω
      }1↑ωnto
      next←α free ω
      back←⇒,/ω+0×next
      wave←⇒,/next
      tree←back@wave←α
      tree ∇∪wave
    }fm
  }
}

```

```

A P r o c e d u r a l   c o d i n g
A Shortest path from/to ω in graph α
A entry/exit vertices
A initial spanning tree
A free vertices in ω
A find partial spanning tree:
A no vertices left: stitched
A found target: path from tree:
A root or unvisited vertex: done
A accumulated path to next vertex
A found target: finished
A next vertices to visit
A back links
A vertex wave front
A SET back links in tree !!!
A advance wave front
A from starting vertex

```

```

A D e n o t a t i v e   c o d i n g
A Shortest path fm/to ω in graph α
A entry-exit vertex vectors
A null spanning tree
A free vertices in ω
A find partial spanning tree:
A no vertices left: no path
A found target: path from tree:
A root or unvisited vertex: done
A accumulated path to next vertex
A found vertex α
A next vertices to visit
A back links
A vertex wave front
A tree with back links
A advanced wave front
A from starting vertex

```

dtb◦rmcm◦□cr'' 'pathP' 'pathD'

```
pathP←{
  fm to←ω
  tree←-2+(ιρα)εfm
  free←α{αα[ω]n''cια=-2}
  {
    ω≡θ:θ
    v/toεω:θ{
      ω<0:α
      (ω,α)∇ ω>tree
    }1↑ωnto
    next←tree free ω
    back←↔,/ω+0×next
    wave←↔,/next
    tree[wave]←back
    ∇∪wave
  }fm
}
```

```
pathD←{
  fm to←ω
  tree←-2+(ιρα)εfm
  free←α{αα[ω]n''cια=-2}
  tree{
    ω≡θ:θ
    v/toεω:θ(▷◦α){
      ω<0:α
      (ω,α)∇ αα ω
    }1↑ωnto
    next←α free ω
    back←↔,/ω+0×next
    wave←↔,/next
    tree←back@wave-α
    tree ∇∪wave
  }fm
}
```