**UNIVERSIDAD EAN**

**FACULTAD DE INGENIERÍAS**

**DESARROLLO DE SOFTWARE**

**GUÍA 4**

**AUTORES**

**CAMILO ANDRES CASCAVITA**

**TUTOR**

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**BOGOTÁ, D.C., 09 DE ABRIL DEL 2024**

Para el siguiente grafo:



* 1. Encuentre (paso a paso) los costos mínimos de los caminos que parten del vértice **A** usando el algoritmo de Dijkstra

Iteración 1:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Vértice** | **Seleccionados** |  | ***A*** | ***B*** | ***C*** | ***D*** | ***E*** | ***F*** | ***G*** | ***H*** | ***I*** |
|  |  | Costo |  |  |  |  |  |  |  |  |  |
| Anterior: |  |  |  |  |  |  |  |  |  |

Iteración 2:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Vértice** | **Seleccionados** |  | ***A*** | ***B*** | ***C*** | ***D*** | ***E*** | ***G*** | ***G*** | ***H*** | ***I*** |
|  |  | Costo |  |  |  |  |  |  |  |  |  |
| Anterior: |  |  |  |  |  |  |  |  |  |

Iteración 3:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Vértice** | **Seleccionados** |  | ***A*** | ***B*** | ***C*** | ***D*** | ***E*** | ***F*** | ***G*** | ***H*** | ***I*** |
|  |  | Costo |  |  |  |  |  |  |  |  |  |
| Anterior: |  |  |  |  |  |  |  |  |  |

Iteración 4:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Vértice** | **Seleccionados** |  | ***A*** | ***B*** | ***C*** | ***D*** | ***E*** | ***F*** | ***G*** | ***H*** | ***I*** |
|  |  | Costo |  |  |  |  |  |  |  |  |  |
| Anterior: |  |  |  |  |  |  |  |  |  |

Iteración 5:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Vértice** | **Seleccionados** |  | ***A*** | ***B*** | ***C*** | ***D*** | ***E*** | ***F*** | ***G*** | ***H*** | ***I*** |
|  |  | Costo |  |  |  |  |  |  |  |  |  |
| Anterior: |  |  |  |  |  |  |  |  |  |

Iteración 6:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Vértice** | **Seleccionados** |  | ***A*** | ***B*** | ***C*** | ***D*** | ***E*** | ***F*** | ***G*** | ***H*** | ***I*** |
|  |  | Costo |  |  |  |  |  |  |  |  |  |
| Anterior: |  |  |  |  |  |  |  |  |  |

Iteración 7:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Vértice** | **Seleccionados** |  | ***A*** | ***B*** | ***C*** | ***D*** | ***E*** | ***F*** | ***G*** | ***H*** | ***I*** |
|  |  | Costo |  |  |  |  |  |  |  |  |  |
| Anterior: |  |  |  |  |  |  |  |  |  |

Iteración 8:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Vértice** | **Seleccionados** |  | ***A*** | ***B*** | ***C*** | ***D*** | ***E*** | ***F*** | ***G*** | ***H*** | ***I*** |
|  |  | Costo |  |  |  |  |  |  |  |  |  |
| Anterior: |  |  |  |  |  |  |  |  |  |

Respuesta:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Vértice** | **Seleccionados** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** |
| Iteración 0 | Costo |  | 0 | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |
|  | Anterior |  | - | - | - | - | - | - | - | - |
| Iteración 1 | Costo |  | 0 | 1 | 14 | ∞ | ∞ | ∞ | ∞ | ∞ |
|  | Anterior |  | - | A | A | - | - | - | - | - |
| Iteración 2 | Costo |  | 0 | 1 | 14 | 16 | ∞ | ∞ | ∞ | ∞ |
|  | Anterior |  | - | A | A | B | - | - | - | - |
| Iteración 3 | Costo |  | 0 | 1 | 14 | 16 | 30 | ∞ | ∞ | ∞ |
|  | Anterior |  | - | A | A | B | C | - | - | - |
| Iteración 4 | Costo |  | 0 | 1 | 14 | 16 | 20 | ∞ | ∞ | ∞ |
|  | Anterior |  | - | A | A | B | D | - | - | - |
| Iteración 5 | Costo |  | 0 | 1 | 14 | 16 | 20 | 28 | ∞ | ∞ |
|  | Anterior |  | - | A | A | B | D | E | - | - |
| Iteración 6 | Costo |  | 0 | 1 | 14 | 16 | 20 | 25 | ∞ | ∞ |
|  | Anterior |  | - | A | A | B | D | F | - | - |
| Iteración 7 | Costo |  | 0 | 1 | 14 | 16 | 20 | 25 | 26 | ∞ |
|  | Anterior |  | - | A | A | B | D | F | G | - |
| Iteración 8 | Costo |  | 0 | 1 | 14 | 16 | 20 | 25 | 26 | 36 |
|  | Anterior |  | - | A | A | B | D | F | G | H |
| Iteración 9 | Costo |  | 0 | 1 | 14 | 16 | 20 | 25 | 26 | 36 |
|  | Anterior |  | - | A | A | B | D | F | G | H |

* 1. ¿Cuál es el camino entre el vértice A y el vértice I y cuánto es el costo de tal camino, de acuerdo con el algoritmo de Dijkstra?

El camino más corto desde A hasta I es: A -> B -> C -> D -> E -> F -> G -> H -> I con un costo total de 41.