

UNIVERSIDAD NACIONAL DE SAN AGUSTÍN
FACULTAD DE INGENIERIA DE PRODUCCION Y SERVICIOS
DEPARTAMENTO DE INGENIERÍA DE SISTEMAS
LABORATORIO - ANÁLISIS Y DISEÑO DE ALGORITMOS

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AULA -10



UNSA

UNIVERSIDAD NACIONAL DE SAN AGUSTÍN DE AREQUIPA

1. Road Reparation

Road Reparation

Entrada:

```

graph LR
    1((1)) --- 4((4))
    1 --- 3((3))
    4 --- 2((2))
    3 --- 2
  
```

Salida:

```

graph LR
    1((1)) --- 3((3))
    4((4)) --- 2((2))
    3 --- 2
  
```

(aristas)

Ahora (sea imposible en el siguiente caso):

```

graph LR
    1((1)) --- 3((3))
    4((4)) --- 2((2))
  
```

(entrada) → Salida imposible

Ponemos a realizar nuevos uniones conjuntos (disjuntos) de acuerdo a las rutas, usando grafos y aristas conectadas. Solución sería encontrar (MST) y llevamos en cuenta los vertices =

if count = $N-1$ → (nos imprimira costo MST)
 en otro caso → (sea imposible - imprimir)

for N (modos) estén conectados entre sí, necesitamos al menos $(N-1)$ aristas

Pruebas:

Road Reparation

[TASK](#) | [SUBMIT](#) | [RESULTS](#) | [STATISTICS](#)

Submission details

Task: [Road Reparation](#)

Sender: Gabriela Malena

Submission time: 2021-12-19 00:46:47

Language: C++11

Status: READY

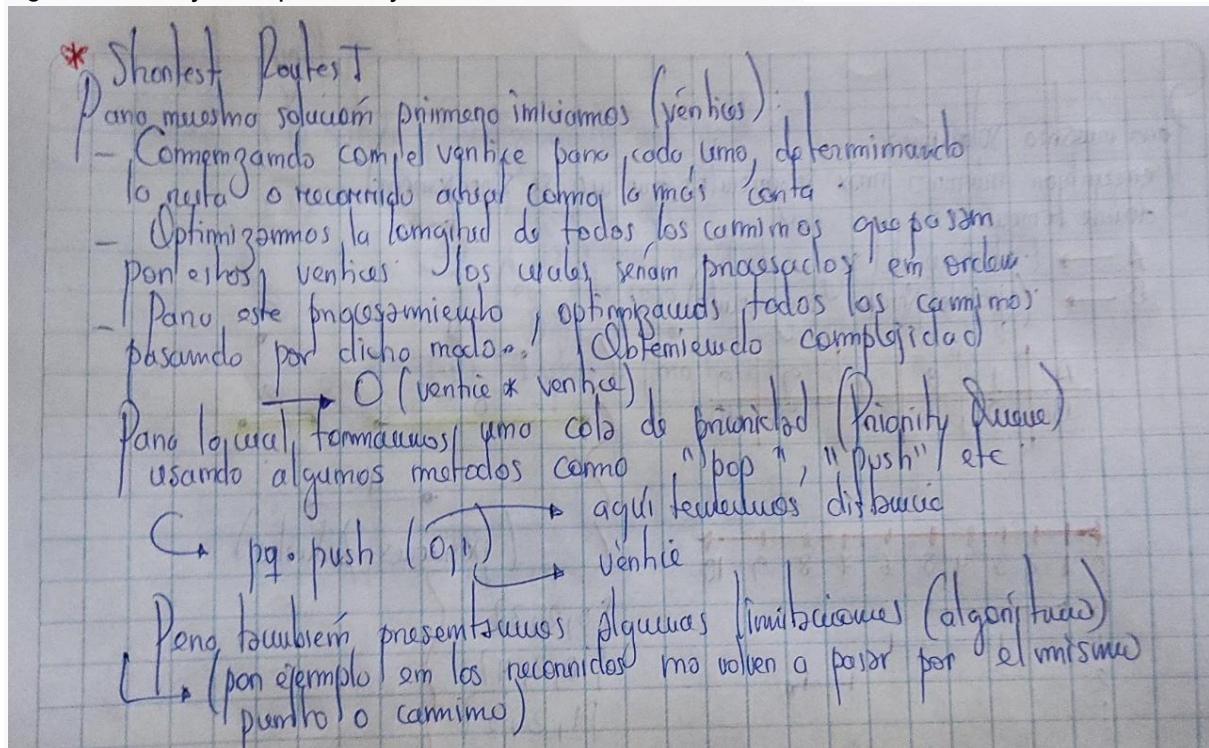
Result: **WRONG ANSWER**

Test results ▲

test	verdict	time	
#1	ACCEPTED	0.01 s	»»
#2	ACCEPTED	0.01 s	»»
#3	ACCEPTED	0.01 s	»»
#4	ACCEPTED	0.01 s	»»
#5	WRONG ANSWER	0.01 s	»»
#6	ACCEPTED	0.24 s	»»
#7	ACCEPTED	0.24 s	»»
#8	ACCEPTED	0.24 s	»»
#9	ACCEPTED	0.24 s	»»
#10	WRONG ANSWER	0.24 s	»»
#11	ACCEPTED	0.12 s	»»
#12	ACCEPTED	0.01 s	»»
#13	ACCEPTED	0.01 s	»»
#14	ACCEPTED	0.01 s	»»

2. Shortest Routes I

Aquí tenemos ciudades y m conexiones aéreas entre ellas, para lo cual debemos determinar la longitud de la ruta más corta desde Syrjälä a cada ciudad, cuyo problema nos presenta el algoritmo de Dijkstra que nos ayuda a resolver la ruta más corta.



Pruebas:

Shortest Routes I

TASK | SUBMIT | RESULTS | STATISTICS | HACKING

Submission details

Task:	Shortest Routes I
Sender:	Gabriela Malena
Submission time:	2021-12-19 01:08:20
Language:	C++11
Status:	READY
Result:	ACCEPTED

Test results ▲

test	verdict	time	
#1	ACCEPTED	0.01 s	»
#2	ACCEPTED	0.01 s	»
#3	ACCEPTED	0.01 s	»
#4	ACCEPTED	0.01 s	»
#5	ACCEPTED	0.01 s	»
#6	ACCEPTED	0.15 s	»
#7	ACCEPTED	0.15 s	»
#8	ACCEPTED	0.15 s	»
#9	ACCEPTED	0.14 s	»
#10	ACCEPTED	0.14 s	»
#11	ACCEPTED	0.08 s	»
#12	ACCEPTED	0.07 s	»
#13	ACCEPTED	0.01 s	»
#14	ACCEPTED	0.07 s	»
#15	ACCEPTED	0.07 s	»
#16	ACCEPTED	0.07 s	»
#17	ACCEPTED	0.07 s	»
#18	ACCEPTED	0.09 s	»

Codigo en consola:

```
3 4
1 2 6
1 3 2
3 2 3
1 3 4
0 5 2

...Program finished with exit code 0
Press ENTER to exit console.
```


3. Shortest Routes II

* Shortest Routes II
primero resolvemos usando Floyd Warshall.
relajamos los nodos $\rightarrow k$
teniendo como vértices (i, j)
Comparamos $\text{dist}(i, j)$ $\leftrightarrow \text{dist}(i, k) + \text{dist}(k, j)$
en caso sea mejor lo optimizamos. como $\rightarrow \text{dist}[i, j] \leftarrow \text{dist}[i, k] + \text{dist}[k, j]$
visitamos nodo $k \rightarrow$ en lugar de ir directo a j .

los pasos siguientes serían realizar las tablas usando Floyd Warshall
y comparar los resultados.

JUSTUS

Pruebas:

Shortest Routes II

TASK | SUBMIT | RESULTS | STATISTICS | HACKING

Submission details

Task:	Shortest Routes II
Sender:	Gabriela Malena
Submission time:	2021-12-19 02:52:38
Language:	C++11
Status:	READY
Result:	ACCEPTED

Test results ▲			
test	verdict	time	
#1	ACCEPTED	0.01 s	»»
#2	ACCEPTED	0.01 s	»»
#3	ACCEPTED	0.01 s	»»
#4	ACCEPTED	0.01 s	»»
#5	ACCEPTED	0.01 s	»»
#6	ACCEPTED	0.18 s	»»
#7	ACCEPTED	0.18 s	»»
#8	ACCEPTED	0.18 s	»»
#9	ACCEPTED	0.18 s	»»
#10	ACCEPTED	0.18 s	»»
#11	ACCEPTED	0.19 s	»»
#12	ACCEPTED	0.20 s	»»
#13	ACCEPTED	0.01 s	»»
#14	ACCEPTED	0.27 s	»»
#15	ACCEPTED	0.24 s	»»

Codigo en consola:

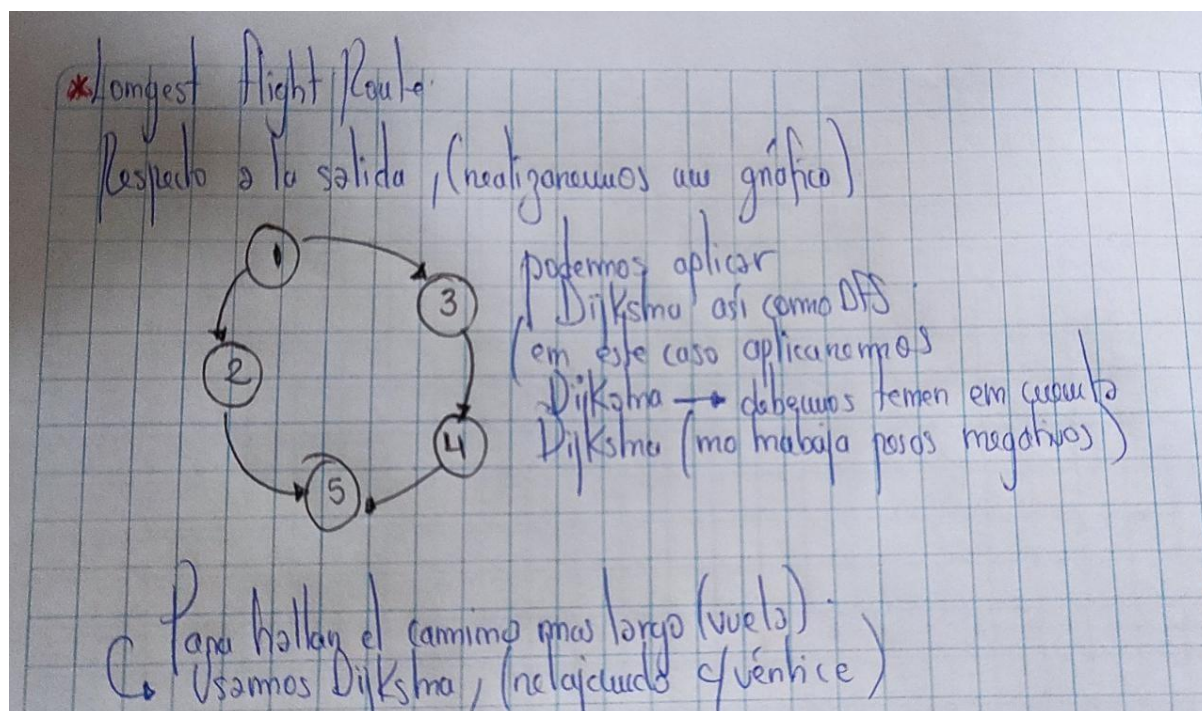
```

2 1
1 3
1 4
3 2
5
5
8
-1
3

...Program finished with exit code 0
Press ENTER to exit console.

```

4. Longest Flight Route



Pruebas:

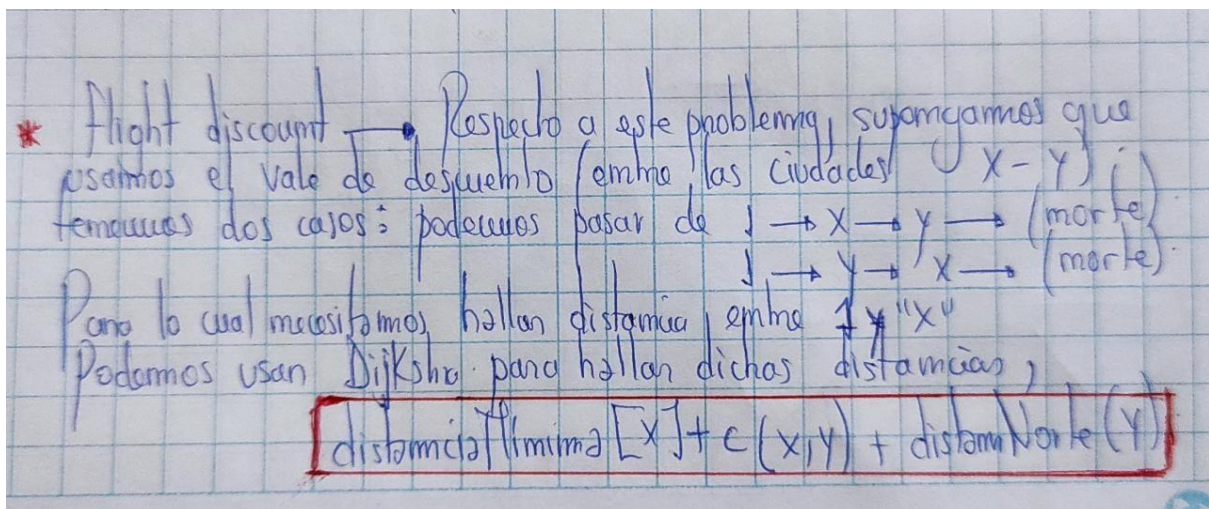
Test results ▲			
test	verdict	time	
#1	ACCEPTED	0.01 s	»»
#2	ACCEPTED	0.01 s	»»
#3	ACCEPTED	0.01 s	»»
#4	WRONG ANSWER	0.01 s	»»
#5	ACCEPTED	0.01 s	»»
#6	WRONG ANSWER	0.16 s	»»
#7	ACCEPTED	0.16 s	»»
#8	ACCEPTED	0.16 s	»»
#9	ACCEPTED	0.16 s	»»
#10	ACCEPTED	0.16 s	»»
#11	ACCEPTED	0.14 s	»»
#12	ACCEPTED	0.14 s	»»
#13	ACCEPTED	0.01 s	»»
#14	ACCEPTED	0.01 s	»»
#15	ACCEPTED	0.11 s	»»
#16	ACCEPTED	0.01 s	»»
#17	ACCEPTED	0.11 s	»»
#18	WRONG ANSWER	0.09 s	»»
#19	ACCEPTED	0.01 s	»»
#20	ACCEPTED	0.08 s	»»

Código en consola:

```
5 5
1 2
2 5
1 3
3 4
4 5
4
1 3 4 5

...Program finished with exit code 0
Press ENTER to exit console.
```

5. Flight Discount



Pruebas: Inicialmente me dio un error de compilación.

Flight Discount

TASK | SUBMIT | RESULTS | STATISTICS | HACKING

Submission details

Task:	Flight Discount
Sender:	Gabriela Malena
Submission time:	2021-12-19 01:11:52
Language:	C++11
Status:	COMPILE ERROR

Flight Discount

[TASK](#) | [SUBMIT](#) | [RESULTS](#) | [STATISTICS](#) | [HACKING](#)

Submission details

Task: [Flight Discount](#)
Sender: Gabriela Malena
Submission time: 2021-12-19 01:26:45
Language: C++11
Status: READY
Result: **ACCEPTED**

Test results ▲

test	verdict	time	
#1	ACCEPTED	0.01 s	»»
#2	ACCEPTED	0.01 s	»»
#3	ACCEPTED	0.01 s	»»
#4	ACCEPTED	0.09 s	»»
#5	ACCEPTED	0.13 s	»»
#6	ACCEPTED	0.09 s	»»
#7	ACCEPTED	0.10 s	»»
#8	ACCEPTED	0.15 s	»»
#9	ACCEPTED	0.09 s	»»
#10	ACCEPTED	0.01 s	»»
#11	ACCEPTED	0.01 s	»»
#12	ACCEPTED	0.01 s	»»
#13	ACCEPTED	0.07 s	»»
#14	ACCEPTED	0.08 s	»»
#15	ACCEPTED	0.01 s	»»
#16	ACCEPTED	0.01 s	»»
#17	ACCEPTED	0.01 s	»»
#18	ACCEPTED	0.12 s	»»
#19	ACCEPTED	0.01 s	»»