

Disjoint Set & Graphs

Bryan Tamin - 2440006122

MST

Prim.

Pick I as start point.

1. I-G 2
I-H 4 G
I-F 18

2. G-H 3
G-E 11 H
G-F 14
G-D 17

3. H-C 1
I-H 4x C
H-E 5
G-E 11
G-F 14
G-D 17
E-F 18

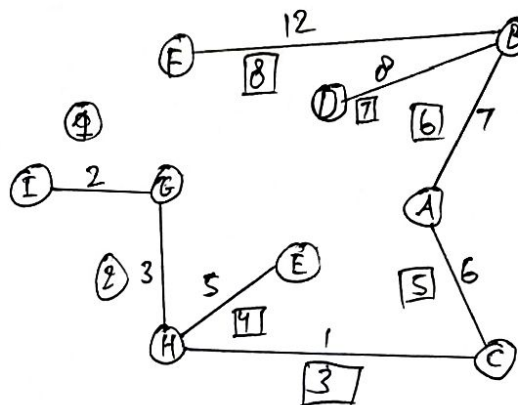
4. H-E 5
C-A 6
C-E 9x E
G-E 11x
C-B 13
G-F 14
G-D 17
I-F 18

5. C-A 6
C-B 13
G-F 14 A
E-A 15x
G-D 17
I-F 18
E-D 19

6. A-B 7
A-D 10
C-B 13x B
G-F 14
G-D 17
I-F 18
E-D 19

7. B-D 8
A-D 10x
B-F 12 D
G-F 14
G-D 17x
I-F 18
E-D 19x

8. B-F 12
G-F 14 F
D-F 16
I-F 18

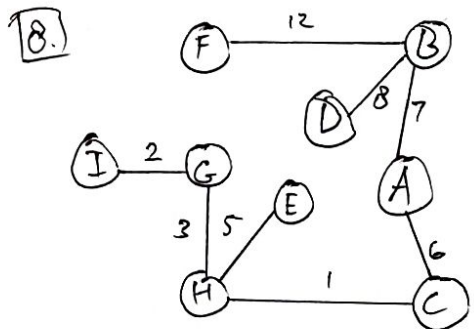
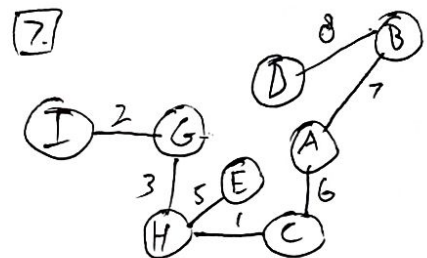
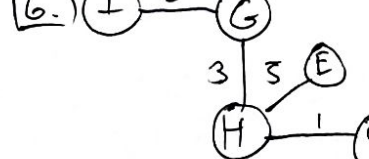
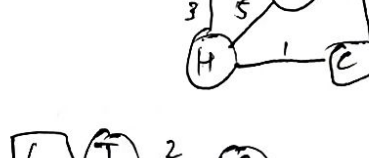
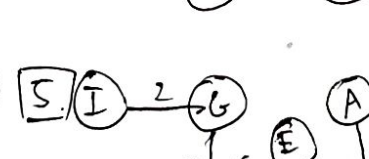
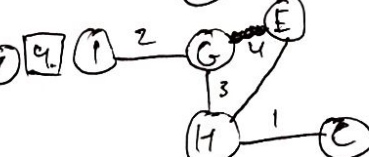
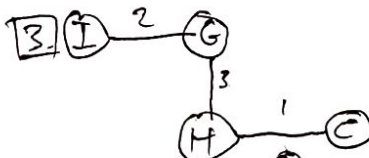


$$MST = 1 + 2 + 3 + 5 + 6 + 7 + 8 + 12 = 44$$

Kruskal

EDGES:

H-C 1 (1)
I-G 2 (2)
G-H 3 (3)
I-H 4 x
H-E 5 (4)
A-C 6 (5)
A-B 7 (6)
D-B 8 (7)
E-C 9 x
D-A 10 x
G-E 11 x
F-B 12 (8)
B-C 13 x
F-G 14 x
E-A 15 x
F-D 16 x
G-D 17 x
I-F 18 x
E-D 19 x



$$MST = 1 + 2 + 3 + 5 + 6 + 7 + 8 + 12 = 44$$

Dijkstra

	A	B	C	D	E	F	G	H	I
I	∞	∞	∞	∞	∞	18_I	2_I	4_I	<u>0_I</u>
G	∞	∞	∞	19_G	13_G	16_G	<u>2_I</u>	4_I	X
H	∞	∞	5_H	19_G	9_H	16_G	X	<u>4_I</u>	X
C	11_C	22_C	<u>5_H</u>	19_G	9_H	16_G	X	X	X
E	11_C	22_C	X	19_G	<u>9_H</u>	16_G	X	X	X
A	<u>11_C</u>	18_A	X	19_G	X	16_G	X	X	X
F	X	18_A	X	19_G	X	<u>16_G</u>	X	X	X
B	X	<u>18_A</u>	X	19_G	X	X	X	X	X
D	X	X	X	<u>19_G</u>	X	X	X	X	X

	A	B	C	D	E	F	G	H	I
F	∞	12_F	∞	16_F	∞	<u>0_F</u>	14_F	∞	18_F
B	19_B	<u>12_F</u>	25_B	16_F	∞	X	14_F	∞	18_F
G	19_B	X	25_B	16_F	25_G	X	<u>14_F</u>	17_G	16_G
I	19_B	X	25_B	16_F	25_G	X	X	<u>17_G</u>	<u>16_G</u>
D	19_B	X	25_B	<u>16_F</u>	25_G	X	X	17_G	X
H	19_B	X	18_H	X	22_H	X	X	<u>17_G</u>	X
C	19_B	X	<u>18_H</u>	X	22_H	X	X	X	X
A	<u>19_B</u>	X	X	X	22_H	X	X	X	X
E	X	X	X	X	<u>22_H</u>	X	X	X	X

Shortest Path from I

$I \rightarrow I = 0$
 $I \rightarrow G = 2$
 $I \rightarrow H = 4$
 $I \rightarrow H \rightarrow C = 5$
 $I \rightarrow H \rightarrow E = 9$
 $I \rightarrow H \rightarrow C \rightarrow A = 11$ to A
 $I \rightarrow G \rightarrow F = 16$
 $I \rightarrow H \rightarrow C \rightarrow A \rightarrow B = 18$
 $I \rightarrow G \rightarrow D = 17$

Shortest Path from F

$F \rightarrow F = 0$
 $F \rightarrow B = 12$
 $F \rightarrow G = 14$
 $F \rightarrow G \rightarrow I = 16$
 $F \rightarrow D = 16$
 $F \rightarrow G \rightarrow H = 17$
 $F \rightarrow G \rightarrow H \rightarrow C = 18$
 $F \rightarrow B \rightarrow A = 19$
 $F \rightarrow G \rightarrow H \rightarrow E = 22$