

Programming Assignment 5 - MST

Test Cases

Graphs Used as Test Cases

[Graph1](#)

[Graph2](#)

[Graph3](#)

[Graph4](#)



NOTE:: In each of the tests below, the "Expected Ouput" shows the result in readable printed form, but the actual grader checked the resulting data structures in your program.

1. Method: MST.initialize

Tested with 4 test cases. In each case partial trees are initialized from the constructed graphs.

Points	Test Case	Expected Output
5	graph1.txt	Vertices: A PQ: (A B 4) (A E 5) Vertices: B PQ: (B A 4) Vertices: C PQ: (C E 6) Vertices: D PQ: (D E 3) Vertices: E PQ: (E D 3) (E C 6) (E A 5) -----
5	graph2.txt	Vertices: A PQ: (A C 1) (A D 6) (A B 8) Vertices: B PQ: (B D 4) (B C 5) (B A 8) Vertices: C PQ: (C A 1) (C E 2) (C B 5) (C D 7) Vertices: D PQ: (D E 3) (D A 6) (D B 4) (D C 7) Vertices: E PQ: (E C 2) (E D 3) -----
6	graph3.txt	Vertices: AA PQ: (AA BB 4) (AA HH 15) Vertices: BB PQ: (BB AA 4) (BB HH 11) (BB CC 8) Vertices: CC PQ: (CC DD 7) (CC BB 8) (CC II 10) (CC FF 18) Vertices: DD PQ: (DD CC 7) (DD FF 14) (DD EE 9) Vertices: EE PQ: (EE DD 9) (EE FF 12) Vertices: FF PQ: (FF GG 2) (FF EE 12) (FF DD 14) (FF CC 18) Vertices: GG PQ: (GG HH 1) (GG II 6) (GG FF 2) Vertices: HH PQ: (HH GG 1) (HH II 13) (HH BB 11) (HH AA 15) Vertices: II PQ: (II GG 6) (II HH 13) (II CC 10) -----
6	graph4.txt	Vertices: A PQ: (A B 1) (A C 3) (A E 2) Vertices: B PQ: (B A 1) (B C 4) (B E 6) (B F 7) (B D 5) Vertices: C PQ: (C A 3) (C B 4) (C G 8) (C D 9) Vertices: D PQ: (D B 5) (D C 9) (D G 10) (D F 11) Vertices: E PQ: (E A 2) (E B 6) (E F 12) (E J 13) Vertices: F PQ: (F B 7) (F E 12) (F D 11) (F J 16) (F G 14) (F I 15) Vertices: G PQ: (G C 8) (G D 10) (G I 17) (G H 18) (G F 14) Vertices: H PQ: (H G 18) (H J 20) (H I 19) Vertices: I PQ: (I F 15) (I G 17) (I H 19) (I J 21) Vertices: J PQ: (J E 13) (J F 16) (J H 20) (J I 21) -----

2. Method: PartialTreeList.remove

This method was tested by initializing with [graph1.txt](#) (using our version of the [MST.initialize](#) method), then applying a sequence of removes on the resulting partial tree list. After each remove, the returned partial tree was checked.

Points	Test Case	Expected Output
2	After 1st remove	Vertices: A PQ: (A B 4) (A E 5)
2	After 2nd remove	Vertices: B PQ: (B A 4)
2	After 3rd remove	Vertices: C PQ: (C E 6)
2	After 4th remove	Vertices: D PQ: (D E 3)
2	After 5th remove	Vertices: E PQ: (E D 3) (E C 6) (E A 5)

3. Method: PartialTreeList.removeTreeContaining

This method was tested as follows. A correct initial partial tree list was created by using our version of the [MST.initialize](#) method, once for [graph1.txt](#), and then once for [graph2.txt](#).

For each of these, a remove was done, using our correct version of [PartialTreeList.remove](#), then your [removeTreeContaining](#) method was run. The returned partial tree and the resulting partial tree list were then both checked for correctness.

Points	Test Case	Expected Output
7	Initialized with graph1.txt Removed partial tree A from partial tree list. Called method for C	Partial Tree - Vertices: B PQ: (B A 4)
		Partial Tree List: Vertices: C PQ: (C E 6)
		Vertices: D PQ: (D E 3)
		Vertices: E PQ: (E D 3) (E C 6) (E A 5) -----
7	Removed partial tree C from partial tree list Called method for E	Partial Tree - Vertices: E PQ: (E D 3) (E C 6) (E A 5)
		Partial Tree List: Vertices: D PQ: (D E 3) -----
7	Initialized with graph2.txt Removed partial tree A from partial tree list Called method for C	Partial Tree - Vertices: C PQ: (C A 1) (C E 2) (C B 5) (C D 7)
		Partial Tree List: Vertices: B PQ: (B D 4) (B C 5) (B A 8)
		Vertices: D PQ: (D E 3) (D A 6) (D B 4) (D C 7)
		Vertices: E PQ: (E C 2) (E D 3) -----
7	Removed partial tree B from partial tree list Called method for D	Partial Tree - Vertices: D PQ: (D E 3) (D A 6) (D B 4) (D C 7)
		Partial Tree List: Vertices: E PQ: (E C 2) (E D 3)

4. Method: MST.execute

Tested with your [PartialTree](#) methods in place

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Points	Tested Input	Expected Output
8	graph3.txt	(AA BB 4) (CC DD 7) (EE DD 9) (FF GG 2) (HH GG 1) (II GG 6) (BB CC 8) (II CC 10)
8	graph4.txt	(A B 1) (C A 3) (D B 5) (E A 2) (F B 7) (G C 8) (H G 18) (I F 15) (J E 13)
4	graph1.txt	(A B 4) (C E 6) (D E 3) (A E 5)