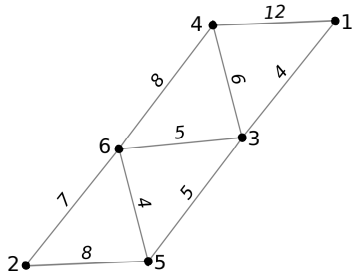
MATH.APP.270 Algorithms for graphs

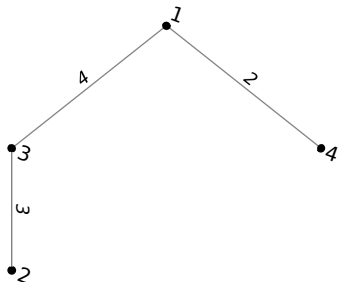
Programming assignment 3: graphs for testing 2022

The graphs that you should use for testing your code are presented here:

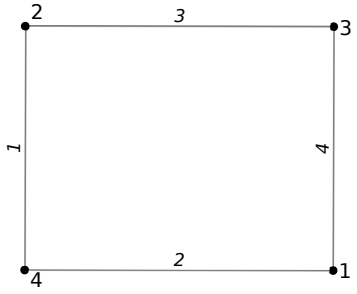
G_1 :



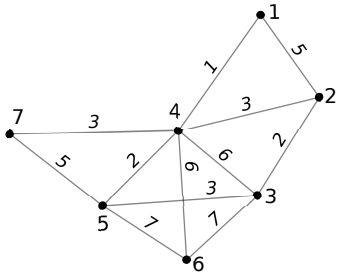
G_2 :



G_3 :



G_4 :



The following table contains input files for these graphs.

graph	Python input file	Matlab input file
G_1	`G01PythonMST.txt`	`G01MatlabMST.m`
G_2	`G02PythonMST.txt`	`G02MatlabMST.m`
G_3	`G03PythonMST.txt`	`G03MatlabMST.m`
G_4	`G04PythonMST.txt`	`G04MatlabMST.m`

The following tables contain the cycles and the final MST when each graph is used as input to MSTCYCLE:

input G_1 :

while-loop iteration	cycle c	edge removed
1	$\langle 4,3,1,4\rangle$	$(1,4)$
2	$\langle 4,6,2,5,3,4\rangle$	$(4,6)$
3	$\langle 6,3,5,2,6\rangle$	$(2,5)$
4	$\langle 6,3,5,6\rangle$	$(3,6)$

MST : $\{(1,3),\ (2,6),\ (3,4),\ (3,5),\ (5,6)\}$

input G_2 : no cycles

MST : $\{(1,3),\ (1,4),\ (3,2)\}$

input G_3 :

while-loop iteration	cycle c	edge removed
1	$\langle 4, 3, 2, 1, 4 \rangle$	$(1, 3)$

MST : $\{(1, 4), (2, 3), (2, 4)\}$

input G_4 :

while-loop iteration	cycle c	edge removed
1	$\langle 3, 4, 2, 3 \rangle$	$(3, 4)$
2	$\langle 5, 4, 6, 3, 5 \rangle$	$(3, 6)$
3	$\langle 4, 5, 3, 2, 1, 4 \rangle$	$(1, 2)$
4	$\langle 6, 5, 7, 4, 6 \rangle$	$(5, 6)$
5	$\langle 5, 4, 7, 5 \rangle$	$(5, 7)$
6	$\langle 2, 4, 5, 3, 2 \rangle$	$(2, 4)$

MST : $\{(1, 4), (2, 3), (3, 5), (4, 5), (4, 6), (4, 7)\}$

NOTE: both graphs G_1 and G_4 have more than 1 MST.