Algorithm Analysis and Data Structures
CS 5343.001: Homework #9

Due on Wednesday December 7, 2016 at 11:59pm

Professor Greg Ozbirn

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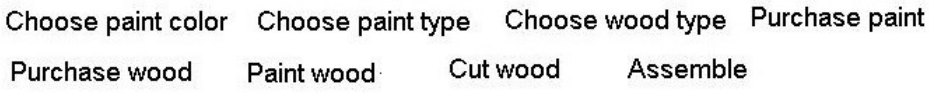
Contents

Problem 1



Problem 2

1. Breadth-first search from I. Start at I.
2. Breadth-first search from I. Visit adjacent vertices D, F, H. (Length = 1)
3. Breadth-first search from I. Visit adjacent vertices C, B, G. (Length = 2)
4. Breadth-first search from I. Visit adjacent vertices A, E. (Length = 3)

Problem 3

V	known	dv	pv
Home	F	0	0
Gas Station	F	∞	0
City Park	F	∞	0
Grocery	F	∞	0
Restaurant	F	∞	0
Post Office	F	∞	0
UTD	F	∞	0
Stadium	F	∞	0
Library	F	∞	0

V	known	dv	pv
Home	T	0	0
Gas Station	F	6	Home
City Park	F	5	Home
Grocery	F	∞	0
Restaurant	F	15	Home
Post Office	F	∞	0
UTD	F	20	Home
Stadium	F	∞	0
Library	F	∞	0

V	known	dv	pv
Home	T	0	0
Gas Station	F	6	Home
City Park	T	5	Home
Grocery	F	7	City Park
Restaurant	F	15	Home
Post Office	F	∞	0
UTD	F	20	Home
Stadium	F	∞	0
Library	F	∞	0

V	known	dv	pv
Home	T	0	0
Gas Station	T	6	Home
City Park	T	5	Home
Grocery	F	7	City Park
Restaurant	F	15	Home
Post Office	F	∞	0
UTD	F	20	Home
Stadium	F	16	Gas Station
Library	F	∞	0

V	known	dv	pv
Home	T	0	0
Gas Station	T	6	Home
City Park	T	5	Home
Grocery	T	7	City Park
Restaurant	F	15	Home
Post Office	F	∞	0
UTD	F	20	Home
Stadium	F	16	Gas Station
Library	F	∞	0

V	known	dv	pv
Home	T	0	0
Gas Station	T	6	Home
City Park	T	5	Home
Grocery	T	7	City Park
Restaurant	T	15	Home
Post Office	F	19	Restaurant
UTD	F	20	Home
Stadium	F	16	Gas Station
Library	F	18	Restaurant

Problem 3 continued on next page...

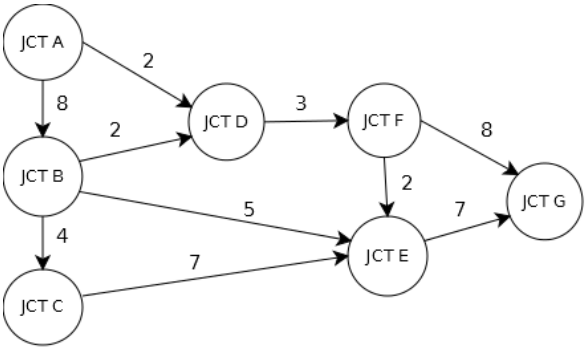
V	known	dv	pv
Home	T	0	0
Gas Station	T	6	Home
City Park	T	5	Home
Grocery	T	7	City Park
Restaurant	T	15	Home
Post Office	F	19	Restaurant
UTD	F	20	Home
Stadium	T	16	Gas Station
Library	F	18	Restaurant

V	known	dv	pv
Home	T	0	0
Gas Station	T	6	Home
City Park	T	5	Home
Grocery	T	7	City Park
Restaurant	T	15	Home
Post Office	F	19	Restaurant
UTD	F	20	Home
Stadium	T	16	Gas Station
Library	T	18	Restaurant

V	known	dv	pv
Home	T	0	0
Gas Station	T	6	Home
City Park	T	5	Home
Grocery	T	7	City Park
Restaurant	T	15	Home
Post Office	T	19	Restaurant
UTD	F	20	Home
Stadium	T	16	Gas Station
Library	T	18	Restaurant

V	known	dv	pv
Home	T	0	0
Gas Station	T	6	Home
City Park	T	5	Home
Grocery	T	7	City Park
Restaurant	T	15	Home
Post Office	T	19	Restaurant
UTD	T	20	Home
Stadium	T	16	Gas Station
Library	T	18	Restaurant

Problem 4


JCT A
JCT B
JCT C
JCT D
JCT E
JCT F
JCT G
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8
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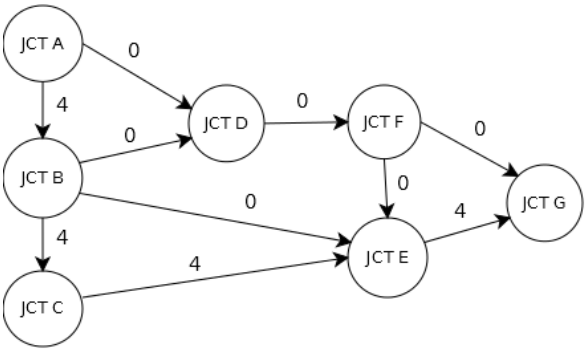
3
8
5
2
7
4
7


JCT A
JCT B
JCT C
JCT D
JCT E
JCT F
JCT G
0
4
0
0
0
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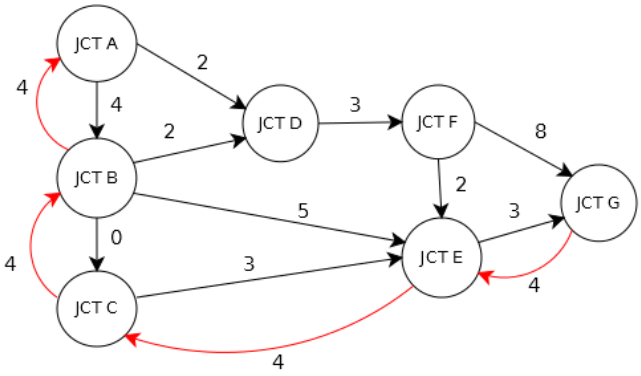
0
4
4


JCT A
JCT B
JCT C
JCT D
JCT E
JCT F
JCT G
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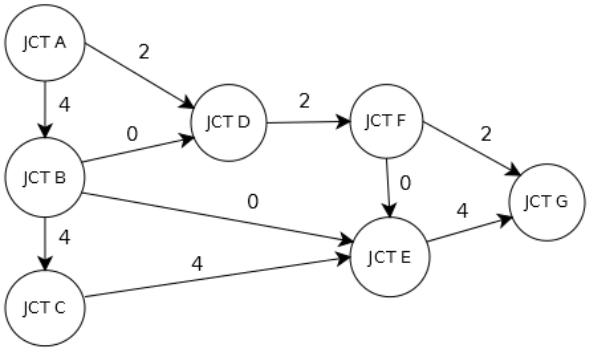
4
4
2
3
8
5
2
3
0
4
3
4
4


JCT A
JCT B
JCT C
JCT D
JCT E
JCT F
JCT G
2
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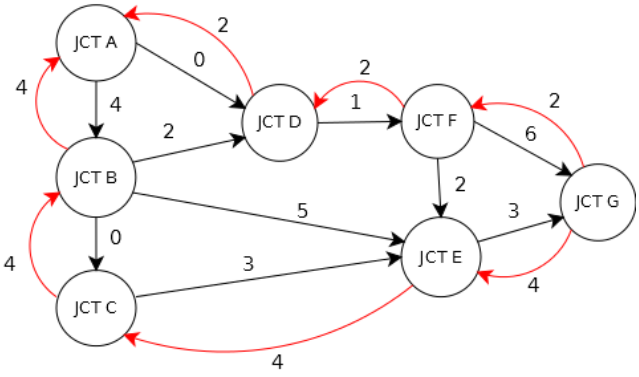
0
2
0
2
4
0
4
4


JCT A
JCT B
JCT C
JCT D
JCT E
JCT F
JCT G
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1
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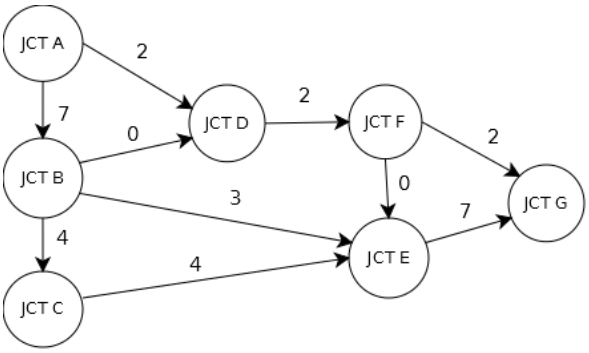
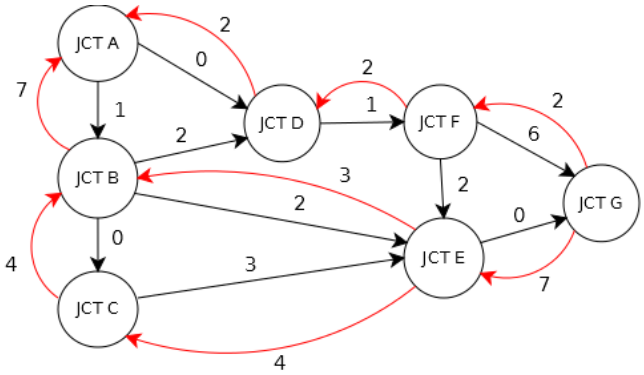
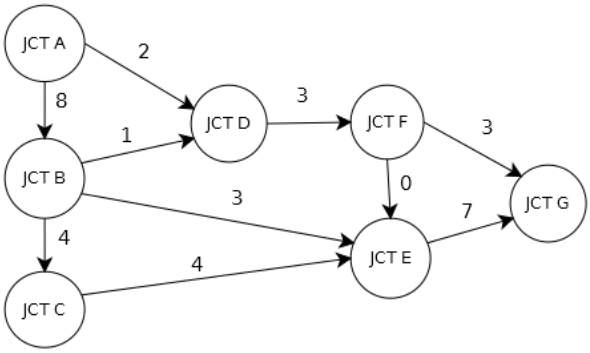
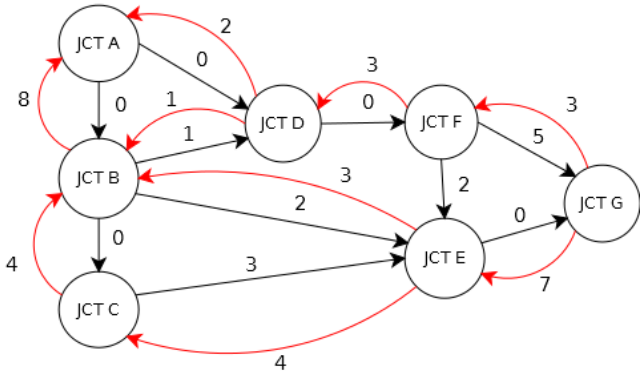
6
2
5
3
0
4
3
4
4



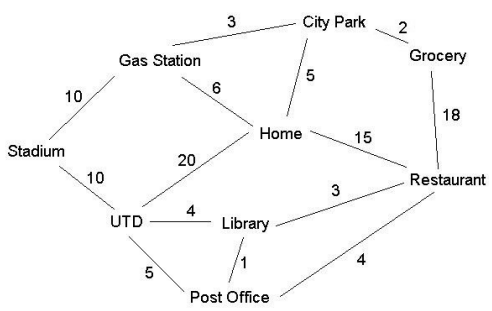






Maximum flow is 10

Problem 5


City Park
Gas Station
Grocery
Home
Stadium
Restaurant
UTD
Library
Post Office
3
2
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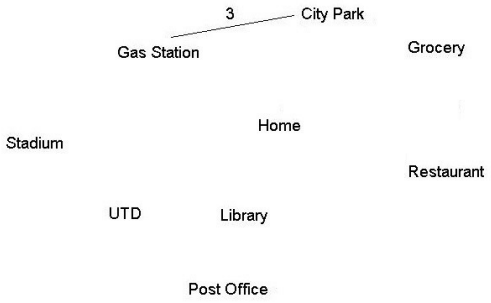
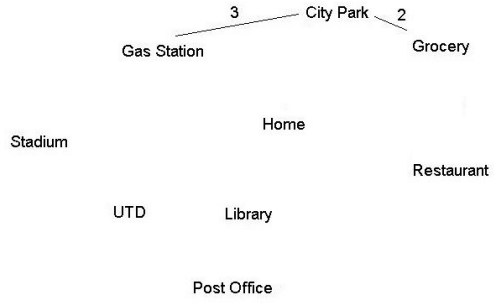

City Park
Gas Station
Grocery
Home
Stadium
Restaurant
UTD
Library
Post Office
3


City Park
Gas Station
Grocery
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Stadium
Restaurant
UTD
Library
Post Office
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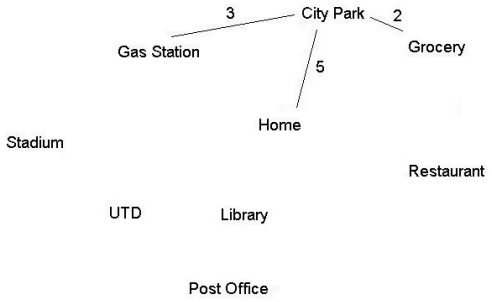
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Library
Post Office
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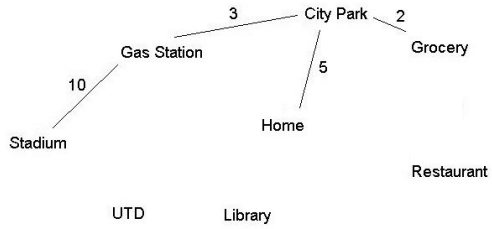
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Restaurant
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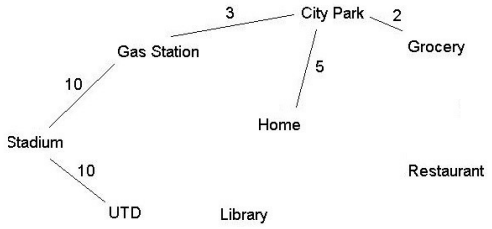
City Park
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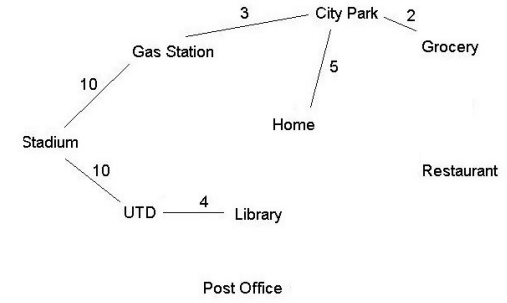
City Park
Gas Station
Grocery
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Stadium
Restaurant
UTD
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Post Office
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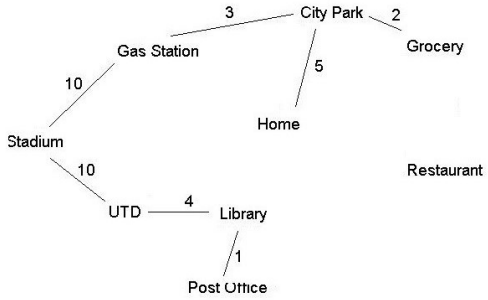
City Park
Gas Station
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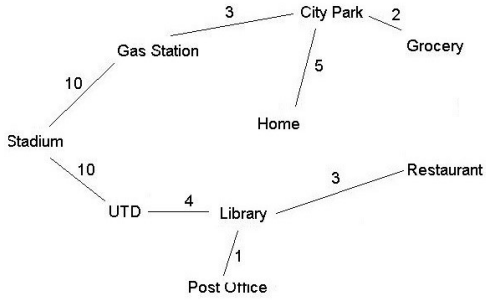
City Park
Gas Station
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Stadium
Restaurant
UTD
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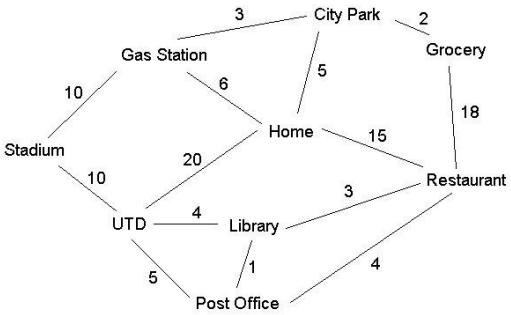
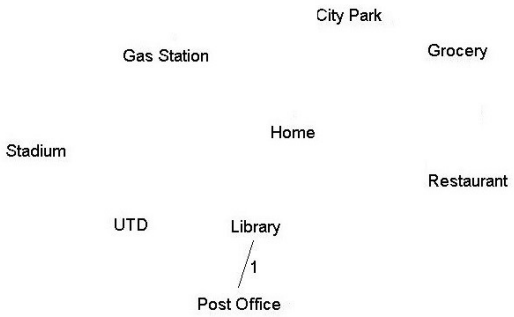
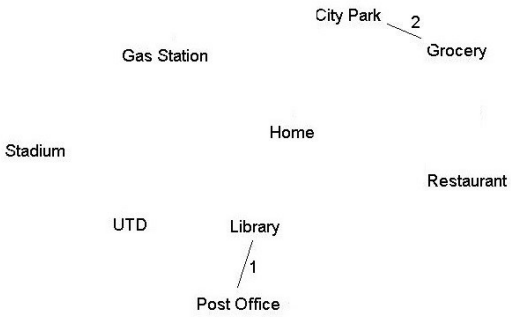
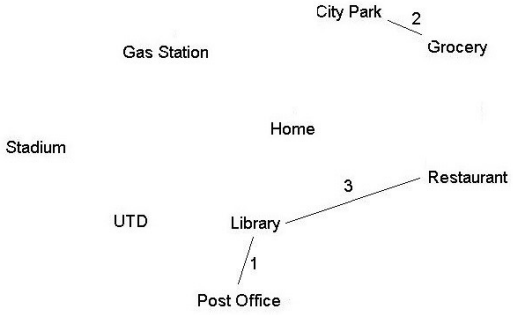
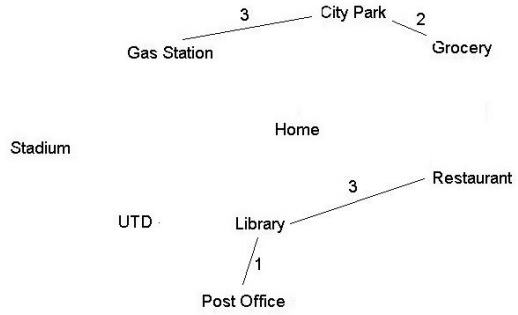
Problem 6

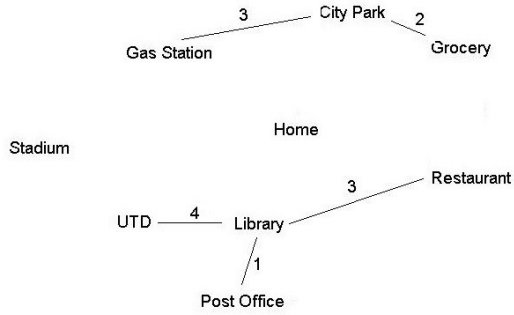












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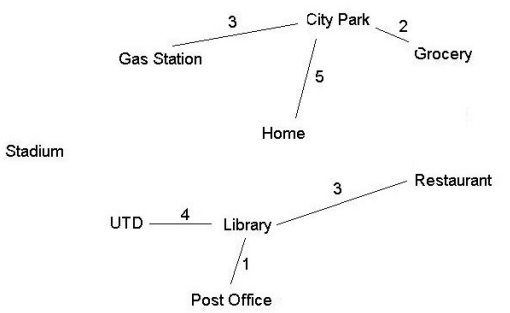
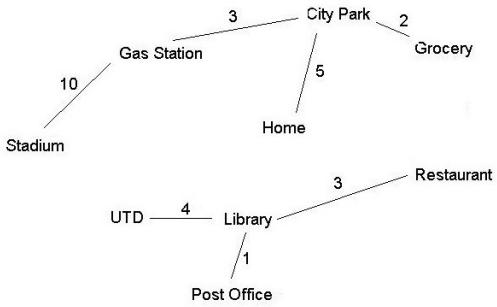
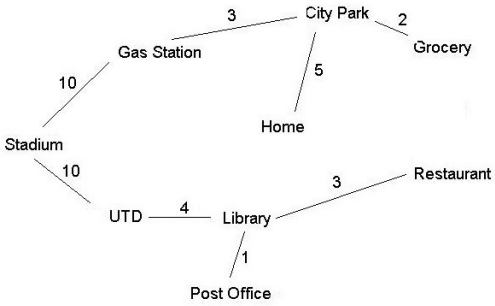
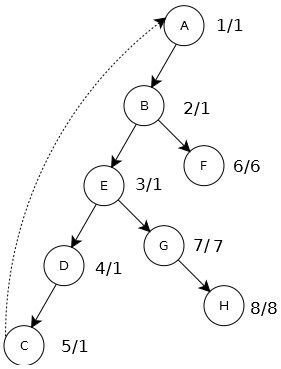






Problem 7

B , E and G are articulation points



Problem 8

It has an Euler Path because the graph has two vertices with odd degree.

B → A → C → D → I → H → G → E → B → F → I