MAD 2104 - HW05 - Romain Roux - PID: 6322237

Ex 1. How many vertices and how many edges do these graphs have ?

a) Kn

Kn has n vertices.
Kn has n(n-1)/2 edges.

b) Cn

Cn has n vertices.
Cn has n edges.

c) Wn

Wn has n + 1 vertices.
Wn has 2 * n edges

d) Km,n

Km,n has m + n vertices.
Km,n has m * n edges.

Ex 3. For which values of n are these graphs regular?

a) Kn

Kn is a complete graph.
Kn is always regular for all n and will be a graph of degree n-1.

b) Cn

Cn is cyclic graph
Cn is always regular for all n values and is a graphs of degree 2.

c) Wn

Wn is wheel graph
Wn is regular for n = 3 and is a graph of degree 3.

Ex 4. For which values of m and n is Km,n regular?

Km,n is regular for m = n and is a graph of degree m.

Ex 7. If G is a simple graph with 15 edges and G^- has 13 edges, how many vertices does G have?

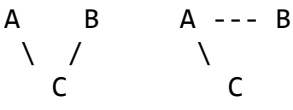
We know that G U G' are complete Graph Kn. So, G+G' = 15+13 = 28

Total number of edges in the complete graph is nC2
nC2 = (n(n-1))/2 = 28

By solving the equation we get n= 8
Therefore the number of vertices, n = 8

Ex 8.

a)



These two graphs are isomorphic.

b)

The two matrix doesn t have the same ammount of edges.
Therefor they are not isomorphic.

c)

The two matrix doesn t have the same ammout of edges.
Therefor they are not isomorphic.

Ex 9.

1) this graph doesn t have an Euler circuit not a Euler path.

2) This graph got an Euler path :
d -> g -> h -> i -> f -> e -> h -> f -> c -> b -> a -> d -> e -> b -> d

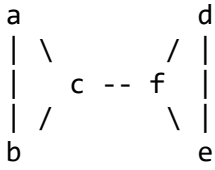
3) This graph doesn t have an Euler circuit but got an Euler path :
a -> b -> e -> b -> d -> e -> a -> c -> e -> c -> d

4) This graph goesn t have an Euler circuit but has an Euler path :
f -> b -> c -> d -> b -> a -> e -> d -> a -> f -> e -> c

5) This graph got an Euler circuit :
a -> e -> a -> e -> c -> d -> e -> b -> d -> c -> b -> a

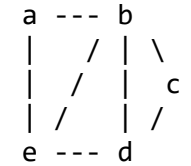
Ex 10.

First graph :



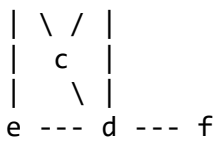
Hamilton circuit : a -> b -> c -> f -> d -> e

Second graph :



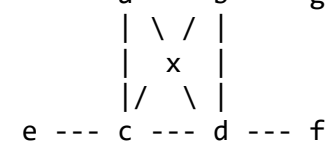
Hamilton circuit : a -> e -> b -> d -> c

Third graph :



Hamilton circuit : f -> d -> b -> c -> a -> e

Fourth graph :



There is no hamilton path on the graph because there is 3 vertice with only 1 edge.

Ex 11.

Graph 1 : Is homeomorphic to K3,3

Graph 2 : is not homeomorphic to K3,3

Graph 3 : is not homeomorphic to K3,3