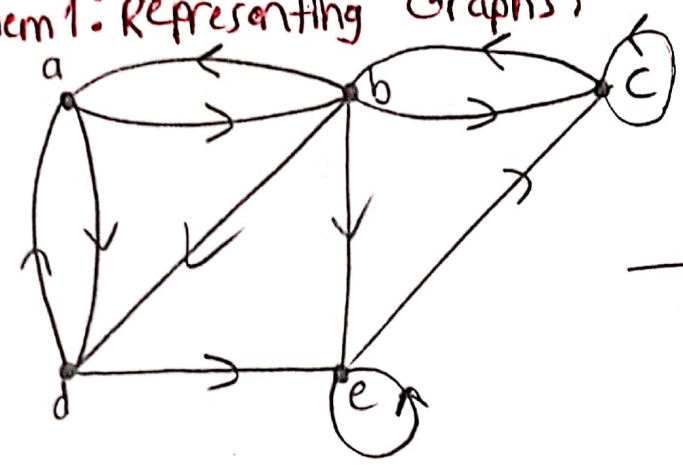
Problem 1: Representing Graphs:

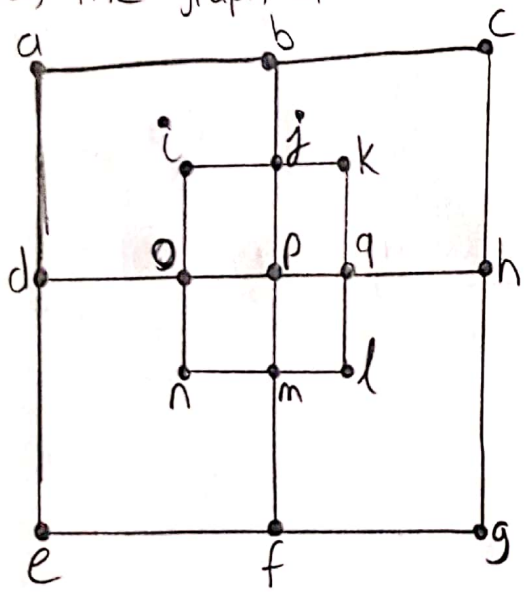


$$\begin{array}{c} \\ a \\ b \\ c \\ d \\ e \end{array}\begin{array}{c} \begin{array}{ccccc} a & b & c & d & e \end{array} \\ \begin{bmatrix} 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & 1 \end{bmatrix} \end{array}$$

- If there is self loop I give the "1"
- If there is no edge I give the "0"
- If there is no self loop I give the "0" (it only applies to its connection with itself.)

Problem 2: Hamilton Circuits:

a) The graph G_1



- We have 3 important items for a circuit to provide the Hamilton circuit.

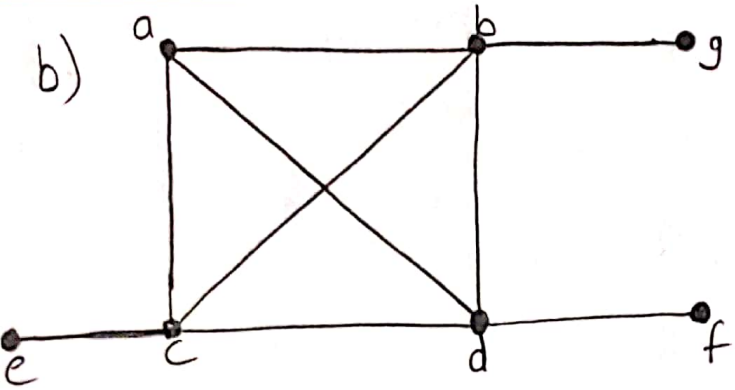
1- A graph with a vertex of edge one cannot have a Hamilton circuit.

2- Moreover, if a vertex in the graph has degree two, then both edges that are incident with this vertex must be part of any Hamilton circuit

3- A Hamilton circuit cannot contain a smaller circuit within it.

a) This graph has not a Hamilton circuit because A Hamilton circuit cannot contain a smaller circuit within it.

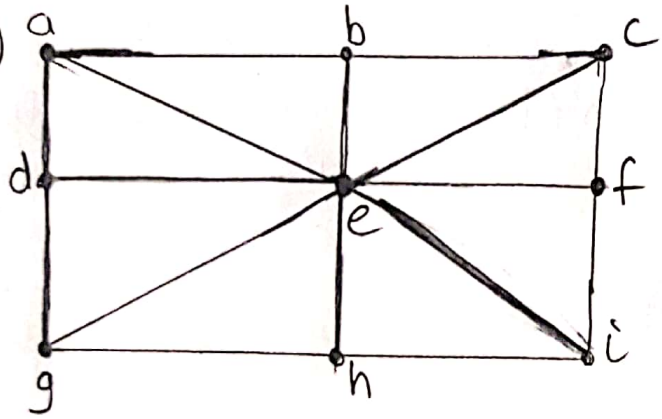
b)



→ Shape b has not Hamilton circuit because A graph with a vertex of edge one cannot have a Hamilton circuit.

The letters e, f and g do not folbw this rule.

c)



→ Yes, this shape has a Hamilton circuit.

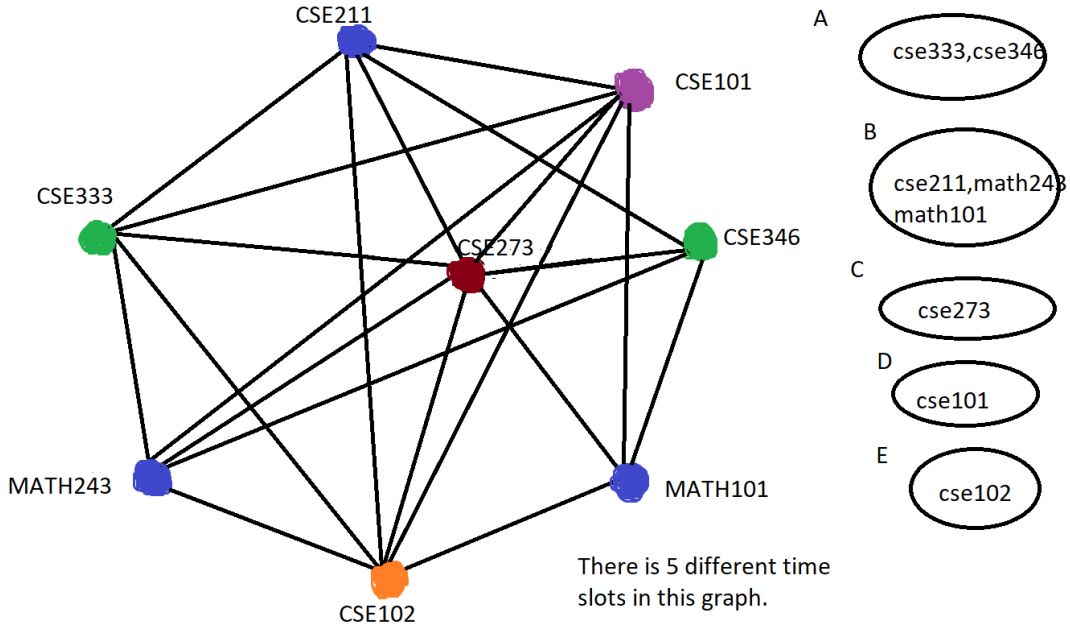
And the Hamilton path is:

a-d-g-h-i-f-c-e-b-a

PROBLEM 3: APPLICATION ON GRAPHS:

If student can take both of these course I give the "+" otherwise I give the "−".

COURSE	CSE 101	CSE 102	CSE 273	CSE 211	CSE 333	CSE 346	MATH 101	MATH 243
CSE 101		+	+	+	+	−	+	+
CSE 102	+		+	+	+	−	+	+
CSE 273	+	+		+	+	+	+	+
CSE 211	+	+	+		+	+	−	−
CSE 333	+	+	+	+		−	−	+
CSE 346	−	−	+	+	−		+	+
MATH 101	+	+	+	−	−	+		−
MATH 243	+	+	+	−	+	+	−	


CSE211
CSE101
CSE333
CSE273
CSE346
MATH243
MATH101
CSE102
A
cse333,cse346
B
cse211,math243
math101
C
cse273
D
cse101
E
cse102
There is 5 different time slots in this graph.