CSE 211 - HW3

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(1)

	a	b	c	d	e
a	0	1	0	1	0
b	1	0	1	1	1
c	0	1	1	0	0
d	1	0	0	0	1
e	0	0	1	0	1

$\Rightarrow$

$$\begin{pmatrix} 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & 1 \end{pmatrix}$$

* The vertical line of a, b, c, d, e are the reference vertices and the horizontal line of a, b, c, d, e are the representative vertices.
* If the reference vertices adjacent to any other vertice with the vertice name from the representative vertices, we put 1 to their intersection in the table, if not we put 0.

(2)

a-)

→ Vertices count: 17 = n
→ n/2 = 17/2 = 8.5

* There are vertices with degrees that are smaller than 8,5. So we cannot check with this method.

* There is no hamilton circuit. Because for 17 vertices, we need 17 edges to form a hamilton circuit. However in this particular graph, we would need at least 18 edges to be able to go through all the vertices once. We need at least 18 edges because, we need to visit all the incident edges of the vertices with degree 2.

{(a,b), (a,d), (b,c), (c,h), (h,g), (g,f), (e,f), (e,d), (i,o), (i,j), (j,k), (q,k), (q,l), (m,l), (n,o), (n,m)} = 16

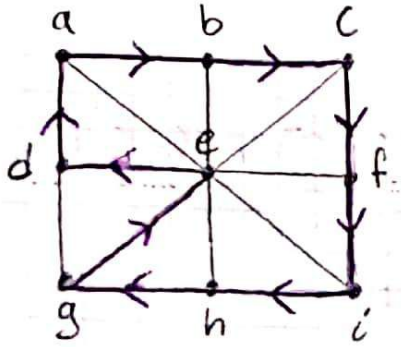
also 2 other for the middle vertice = 16+2=18

18 ≠ 17 that's why there is no hamilton circuit.

b-)

* There is no hamilton circuit because there are 3 vertices which have a degree of 1. There cannot be any hamilton circuit in a graph which has vertices with degree one.

c-)



*There is a hamilton circuit.
a→b→c→f→i→h→g→e→d→a

③

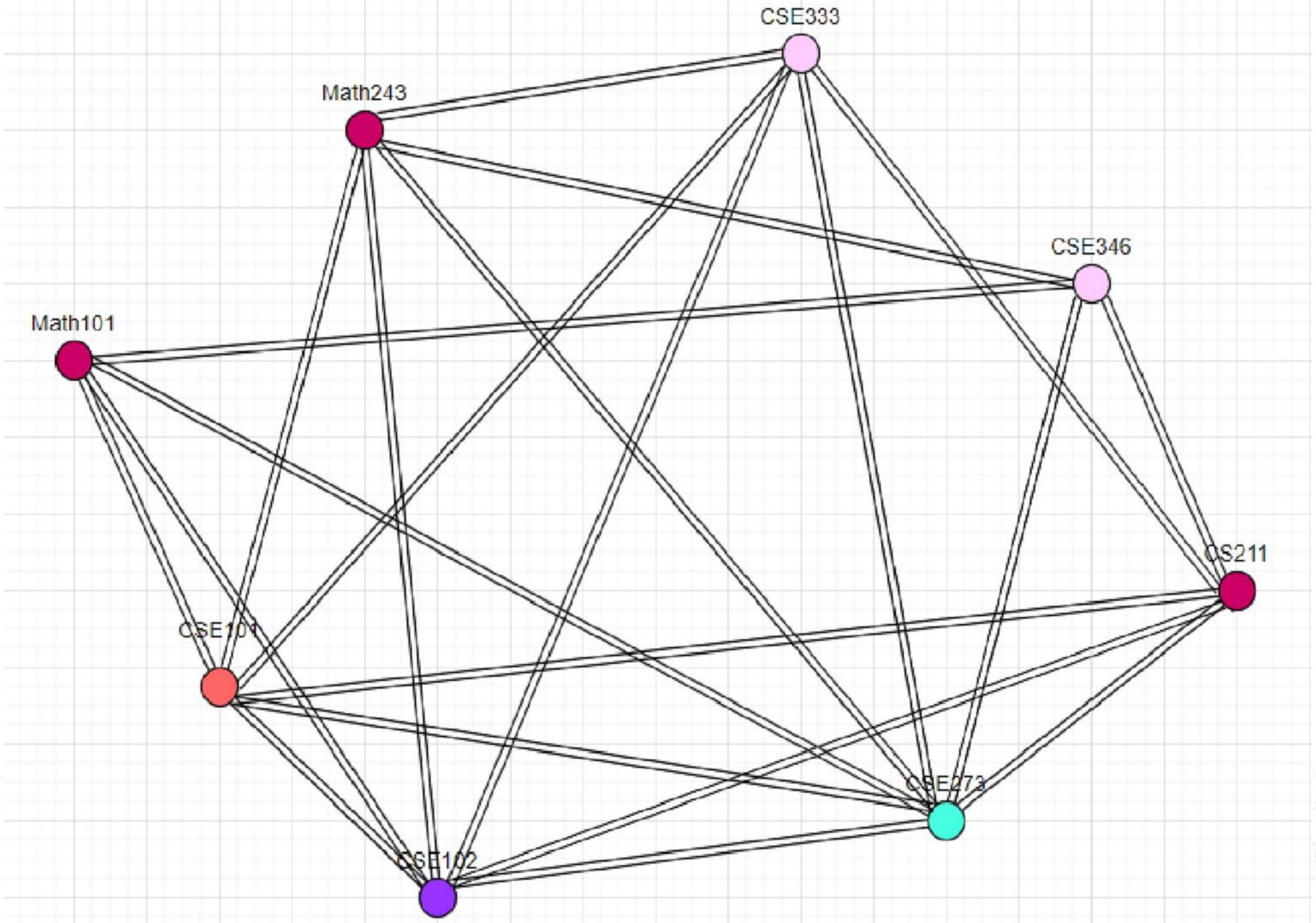
*Note: Done assuming CS 211 is miswritten as CSE 211. CS 211 will be used in place of CSE 211.

*Firstly listing which classes' exams cannot be at the same time with which classes' exams. Determining which ones should live at the same time.

→For Math 101	→For Math 243	→For CSE 333	→For CSE 346
-CSE 346	-CSE 333	-Math 243	-Math 101
-CSE 101	-CSE 346	-CSE 101	-Math 243
-CSE 102	-CSE 101	-CSE 102	-CSE 273
-CSE 273	-CSE 102	-CSE 273	-CS 211
	-CSE 273	-CS 211	

→For CSE 101	→For CSE 102	→For CSE 273	→For CS 211
-Math 101	-Math 101	-All the	-CSE 333
-Math 243	-Math 243	others	-CSE 346
-CSE 333	-CSE 333		-CSE 101
-CSE 102	-CSE 101		-CSE 102
-CSE 273	-CSE 273		-CSE 273
-CS 211	-CS 211		

*Secondly, drawing a graph that connects the ones that needs to live at the same time.



* According to the graph, we can make 5 different groups for 5 different time slots.

Time Slot 1	Time Slot 2	Time Slot 3	Time Slot 4	Time Slot 5
- CSE 273	- CS 211	- CSE 333	- CSE 101	- CSE 102
	- Math 243	- CSE 346		
	- Math 101			

* Colouring the ones which have the same time slot with the same colours.