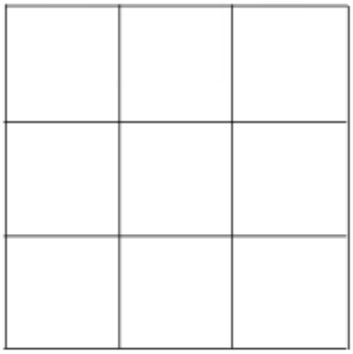
ESD 505 Principles of Embedded Systems

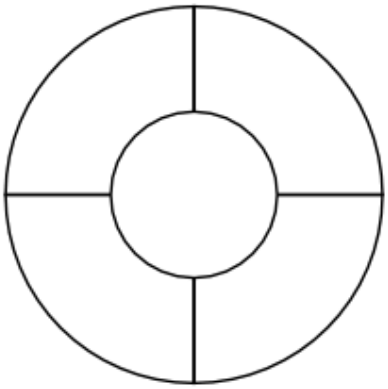
Assignment Submission Date (22nd Sept. 2014)

1. Find the minimum number of colours required to colour the following planar graphs. Note that two adjacent regions should not have the same colour. Two regions are adjacent if they are separated by a common edge. Draw interference graphs corresponding to a), b) and c). To obtain interference graphs consider each region as a variable and two variables are connected if there is an edge separating the regions.(9 marks)

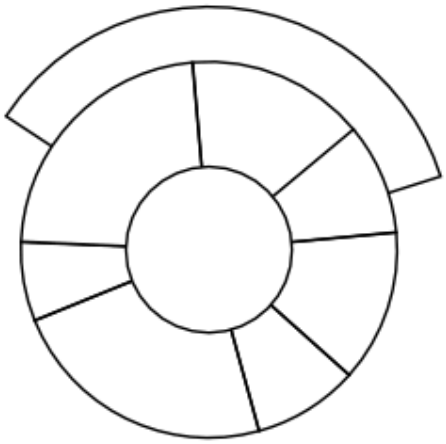
a)



b)



c)



2. Give examples of C codes whose interference graphs correspond to a), b) and c) in question 1. (12 marks)

3. Reading Assignment: All topics in Chapters 5 and 6 of Wayne Wolf's book "Computers as Components"

4. For the processes shown below:

a) Schedule the processes using RM and EDF policy after checking for feasibility,

In each case compute the schedule for an interval equal to the least common multiple of the periods of the processes. Time starts at t = 0. .(3 Marks)

Process	Execution time	Deadline
P1	1	3
P2	1	4
P3	2	6

5. For the processes shown below:

b) Schedule the processes using RM and EDF policy after checking for feasibility,

In each case compute the schedule for an interval equal to the least common multiple of the periods of the processes. Time starts at t = 0. .(3 Marks)

Process	Execution time	Deadline
P1	4	6
P2	2	8
P3	1	12

6. For the processes shown below:

c) Schedule the processes using RM and EDF policy after checking for feasibility,

In each case compute the schedule for an interval equal to the least common multiple of the periods of the processes. Time starts at t = 0.(3 Marks)

Process	Execution time	Deadline
P1	3	6
P2	3	9
P3	3	12

7. Write your C codes for RMS and EDF scheduling schemes which should handle at least 100 tasks. Code should check for feasibility and prints output in a format which is easy to check and verify. (10 Marks)

Try all the problems on your own and depend on friends only for hints for, "Anyone who has never made a mistake has never **tried anything** new." – Albert **Einstein**