COMP215/Design & Analysis of Algorithms
## Quiz 3
20 points

Q1: [6 points] Fill in the space with the correct answer:

1. One Dynamic programming follows a three-steps:

    1. _____

    2. _____

    3. _____

2. The knapsack problem can be solved using dynamic programming in O(_____) time.

3. In n-vertex path graphs, a maximum-weight independent set can be computed using dynamic. programming in O(_____) time.

4. The Knapsack Reconstruction Algorithm runs in O(_____)time

Q2: [5 points]: Consider the input graph:

A	B	C	D	E	F
5	4	12	3	8	2
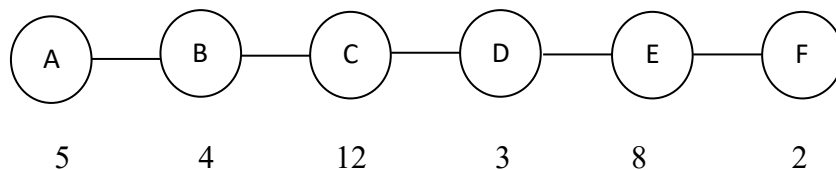
where vertices have their weights below them. What are the final array entries of the WIS algorithm, and which vertices belong to the MWIS? (Show your work)

Q3 [9 points]: Consider an instance of the knapsack problem with five items:

Item	Value	Size
1	6	2
2	9	3
3	4	1
4	3	5
5	5	4

and knapsack capacity C = 9. What are the final array entries of the Knapsack algorithm, and which items belong to the optimal solution? (Show your work)

Extra Paper for Solutions