# ESO207 Assignment-4

Submission Deadline: Nov. 14, 2020 (23 hrs : 59 mins)

**Maximum marks:** 100

## Instructions

- Only one submission per team is allowed.

- Each team should work independently and write its own code.

- As usual, use any one of the four programming languages: C, C++, Java or Python.

- Document your program properly so that it is understandable to the reader.

**Q1(40+40+20)** Please read problem 15-4 from the book, it is titled 'Printing neatly'. In this question you need to write a program to solve this problem. Your program should take as input a list of words $(l_1, \ldots, l_n)$ and a natural number $M \leq 80$ as its inputs. It should print the input list of words 'neatly' (as defined in the problem) divided over lines. It should return the minimized quantity (sum of cubes of the number of spaces at the end of each line except the last) mentioned in the problem.

**(a)** Write a program implementing top-down dynamic programming algorithm for this problem.

**(b)** Write a program implementing bottom-up dynamic programming algorithm for this problem.

**(c)** What is the complexity of your algorithms in (a) and (b). Do you see difference in the time taken by programs in (a) and (b), in practice on large inputs.

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