

Submit your code (both calculation, plotting (with data, if used). Along with Figures. MA1NNNN- \_Name- \_6Feb2020.zip or .tar (Please see next page) and submit

Free to check online, use any notes/book except discussing.

Don't copy codes. I will compare all codes using autotamted script to check for potential copy.

→ Algorithm can be same, but not the variable, declaration and style (Smart people can easily by pass it, but need again to do a bit of coding).

1) Suppose that the position of a falling object is governed by

$$\frac{d^2x}{dt^2} + \frac{c}{m} \frac{dx}{dt} - g = 0$$

$c$ = a first-order drag coefficient = 12.5 kg/s,

$m$ = mass = 70 kg

$g$ = gravitational acceleration = 9.8 m/s<sup>2</sup>

Use shooting method to solve this equation for position and velocity given the boundary conditions,  $x(0) = 0$  and  $x(12) = 500$  m

2) Mathematical model of an electrical circuit is

$$0.5 \frac{d^2Q}{dt^2} + 6 \frac{dQ}{dt} + 50Q = 24 \sin 10t$$

$Q=0, I = dQ/dt = 0$  at  $t=0$

Get the  $Q$  and  $I$  with  $t = 0$  till 72

Use any a) explicit and b) implicit method

Make directory (example below)

Label Figures properly.

MS16999-\_VishalBhardwaj-\_6Feb2020

Make Directory Pb1 and Pb2

If one code is used for calculation plotting then name : Problem1.py

Otherwise

Problem1.C and Plotting1.C

I assumed that .py has by default the plotting and don't need the plotting tool.  
While .C might need.

If Problem1 is divided into two parts (not recommended)

Problem1-a

Problem1-b

Figures should be in .png format

Figure1-a.png

Figure1-b.png

Don't forget to use your roll number and name.