

# M2E03 - INTRODUCTION TO MODELLING

## ASSIGNMENT 2

DUE:NOON,THURSDAY,FRIDAY 21 OCTOBER

All the Question should be written in MATLAB and title of the email should be "SOLUTION TO ASSIGNMENT 2"

Submit clear legible matlab programme for the solution at email:manimeh@gmail.com  
LATE ASSIGNMENTS WILL RECEIVE A GRADE OF ZERO.

1. Write a matlab programme to check arbitrary number whether it is prime or not?. (Where input of any number should be given by command line using the 'input' command)
2. Use the MATLAB plot function to draw the logistic growth of a population with a carrying capacity of 50 and the value of  $r = .5$  over 30 discrete time steps, starting with a population size of 1.
3. Use the MATLAB plot function to draw the discrete logistic growth of a population with a  $F(N) = N[1 + r(1 - N/K)]$  carrying capacity of 50 and for the different value of  $r = .5, 1.95, 2.32.9$  over 30 discrete time steps, starting with a population size of 1.
4. Do the question 3 by changing  $F(N) = Ne^{r(1-N/K)}$  over 200 discrete time steps. Analyse the result and give the message by using 'fprintf' command whether scheme will give stable or unstable result correspond to different value of  $r$ .
5. The growth of a laboratory culture of Paramecium was accurately predicted by the logistic growth equation. If the equilibrium density is 400 individual per ml, and the intrinsic rate of natural increase is .7 per day, what is the predicted density of individual after 10 days in a culture started with 5 individuals per ml.
6. Growth of Paramecium candidum population in the medium of Osterhout is given by the following table.

Day	0	2	4	6	8	9	10	12	14	16	18	20	22
Density	2	10	11	56	137	194	199	182	179	206	196	234	210

Give the best linear fit on this data using the plot function.