ASSIGNMENT - 2

(Marks 10)

1.   Harshad numbers
   A. Find the first factorial which is not a Harshad number. Bonus: Find the next factorial.
   B. 110, 111, 112 are three consecutive Harshad numbers. Find the ten consecutive Harshad numbers. Bonus: Explain why there are no twenty or more consecutive Harshad numbers.

2.   Polynomial

   A. Determine the modified Legendre polynomial of the 100th order.
   B. Determine the companion matrix of this polynomial.
   C. Determine the roots of the polynomial by determining the eigenvalues of the companion matrix using LU decomposition.
   D. Determine the solution of Ax=b, when b={1,2,3,...n} using LU decomposition.
   E. Determine the smallest and largest roots of the polynomial using the Newton-Rapshson method.