Problem - 1 (Spring 2024)

Due date: 15 February, 2024

1. a) Generate N random points inside a three-dimensional cubic box of length L using a uniform random distribution.

   b) Modify the program above in such a way that the distance between any two points is greater than or equal to a minimum value of r_c.

   c) Comment on the choice of r_c values in terms of N and L. Plot the distribution of the points in both the cases above.

   d) Plot the distribution of radial distances, $P(r_{ij})$, versus r_{ij}, where r_{ij} is the distance between two points i and j. Normalize the distribution.

   Note: You may use an external random number generator for generating uniform random variates.