



# **PES UNIVERSITY, Bangalore**

(Established under Karnataka Act No. 16 of 2013)

## **Department of Computer Science & Engineering**

### **Statistics for Data Science**

#### **Assignment – Normal Distribution**

1. A cylindrical hole is drilled in a block, and a cylindrical piston is placed in the hole. The clearance is equal to one-half the difference between the diameters of the hole and the piston. The diameter of the hole is normally distributed with mean 15 cm and standard deviation 0.025 cm, and the diameter of the piston is normally distributed with mean 14.88 cm and standard deviation 0.015 cm.
  - a. Find the mean clearance.
  - b. Find the standard deviation of the clearance.
  - c. What is the probability that the clearance is less than 0.05 cm?
  - d. Find the 25th percentile of the clearance.
  - e. Specifications call for the clearance to be between 0.05 and 0.09 cm. What is the probability that the clearance meets the specification?
  - f. It is possible to adjust the mean hole diameter. To what value should it be adjusted so as to maximize the probability that the clearance will be between 0.05 and 0.09 cm?
2. Choose an appropriate dataset and explore the Normal distribution conceptually practically using Python.