BITS F327
Assignment 3

Due Date: 05/04/2023 Total marks 12

1. Collect data with an ultrasonic sensor (HC-SR04) for a known and static environment with one object placed in the range of the sensor.
   a. Plot the data in a 2D coordinate frame. [2]
   b. Divide the area of the map in a suitable grid division and show in the plot. [2]
   c. Divide the grid map in 4 zones (I, II, III, & IV as discussed in the class) and show in the diagram. Explain the reason for the division of the zones. [2+1]
   d. Use the occupancy grid method to calculate the probability of the occupancy of each grid for zone I and II only. Fit the occupancy of this 2d map with an approximate surface module, where the height of the surface at any grid location is the probability of occupancy value. [5]
   (You can take/browse any existing surface fitting function code available online. Give reference)

Submission:

1a, 1b, 1c – Doc file with 2d plots and answer

2d – a 2D grid plot with each grid having a occupancy probability value, and a surface plot in a 3D coordinate system for the same data.