An-Najah National University

Computer Science Apprenticeship

Assignment-2 Bayes Rules in Python

Introduction to Probability Theory Spring 2023 - 2024

In this assignment, you need to implement a python application to calculate the probability of some given events using the probability rules/formulas/axioms learned so far throughout the course.

We are interested in risk factors that might cause diabetes. We have collected data for 1000 individuals, including their age, hypertension, bmi and heart disease as a csv file that contains the following columns:

* age: Age (years)
* hypertension: whether a patient has hypertension (1) or not (0)
* BMI: Body mass index (weight in kg/(height in m)^2)
* heart\_disease: whether a patient has a heart disease (1) or not (0)
* blood\_glucose\_level: Plasma glucose concentration
* diabetes: whether a patient has diabetes (0) or not (1)

You are asked to calculate the following probabilities:

1. the probability that a person will have diabetes given that he/she has heart disease.
2. If someone is having diabetes, what is the probability that his/her age is over 50 and his/her blood glucose level is less than 100.
3. the probability of having diabetes for individuals whose age is over 50 and they have heart disease.
4. the probability that someone is having diabetes if their BMI is greater than a value entered by user.

Note:

* Use only the data structures and control structures learned in the course and do not make use of off-the-shelf libraries to calculate these probabilities.
* You will get the grade based on:
  + The obtained result
  + Discussion
  + Code organization