

## **COSC 311 Homework 3 (10 points)**

**Due Sunday, 23 April 2023 at 11:59 PM**

Please finish the following tasks and submit your homework report via MyClasses. Your submission must contain your source code file (one “.py” file for all code) and a PDF document. The PDF contains the results (may use screenshot) of your program.

### **Food type recognition application**

#### **1. Dataset**

- Please download the "Food type recognition dataset" named "***FoodTypeDataset.csv***" from this homework assignment.
- In this dataset, each sample contains 65 attributes (column 1 – 65) and one food type label (column 66). The attribute values are normalized and can be directly used for model training and testing. The food type label is from 1 to 20, representing 20 different food types.
- There are 933 samples collected from multiple users.

#### **2. Tasks**

- Randomly split this dataset into two parts: 80% for training and 20% for testing.
- Select a classification algorithm (any classification algorithm), set appropriate parameters to build a classification model, which can obtain the highest testing accuracy on the testing data.
- Use Classification Report to show the classification performance of the above test.
- Use a heatmap to show the classification confusion matrix of the above test. Explain the misclassification between food types.

### **Policy**

1. Each student **MUST** finish this homework independently. **NO TEAM WORK** and **DISCUSSION** are allowed. If you need any help, please feel free to contact the instructor.
2. You need to write your whole program in an editor and save your source code as a “.py” file, which will be submitted to MyClasses together with your PDF report.