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Faculty of Computers and Artificial Intelligence

Computer Science Department

2021/2022

**CS 395 Selected Topics in CS-1**

**Research Project**

Report Submitted for Fulfillment of the Requirements and ILO’s for Selected Topics in CS-1 course for Fall 2021

Team No. 24

|  |  |  |  |
| --- | --- | --- | --- |
|  | ID | Name | Grade |
|  | 201900602 | ماريز عادل عريان | Third |
|  | 201900876 | مينا جمال منقريوس خله | Third |
|  | 201900522 | عمر عماد راضي أحمد | Third |
|  | 201900503 | عمر أيمن محمد زكي | Third |
|  | 201900513 | عمر عاطف عبدالعزيز محمد | Third |
|  | 201900520 | عمر عصام دسوقي مرسي | Third |
|  | 201900544 | عمرو مصطفي محمد أحمد | Third |

Delivered to:

**Dr. Wessam El-Behaidy**

**Eng. Islam Gamal**

**Eng. Muhammed Kamal**

I. NUMERICAL DATASET

1. Project Introduction

* 1. **Dataset Name :**

**-Bill Authentication For SVM**

**-Churn Modelling For ANN**

* 1. **Number of classes and their labels**
* **2**
* **True/False**
  1. **Dataset Samples Numbers :**

**-Number of rows in Dataset :**

* + **Bill Authentication : 1373 rows.**
  + **Churn Modelling : 10001 rows.**
  1. **Training, Validation and Testing :**
* **SVM:**
  + **Training : 80 records**
  + **Testing : 274 records**
* **ANN:**
  + **Training : 8000 records**
  + **Testing : 2000 records**

1. Implementation Details
   * 1. **Extracted Features:**

**Credit score, geography, gender ,age , tenure ,balance of products , has crcard , is active member, estimated salary**

* + 1. **Cross-validation**

(Is cross-validation is used in any of implemented models? If yes, specify the number of fold and ratio of training/validation)

no

* + 1. **Artificial Neural Network (ANN)**
* **Hyper-parameters**

(Specify all the hyper-parameters (initial learning rate, optimizer, regularization, batch size, no. of epochs…) with their specified value in implementation)

optimizer = ‘adam’

batch size = 32

epochs = 100

* + 1. **Support Vector Machine** **(SVM)**
* **Hyper-parameters**

(Specify all the hyper-parameters (optimizer, regularization, …) with their specified value in implementation)

Kernel = ‘Linear’

Gamma = ‘auto’

C = ‘1.0’

1. Models Results

**For each model you should show all these results for your model on testing data** (loss curve, accuracy, confusion matrix, ROC curve)

* 1. **ANN Results**

[[False]]

* 1. **SVM Results**

**Calendar

Description automatically generated**

II. IMAGE DATASET

1. Project Introduction

* 1. **Dataset Name**

**ANN:EMNIST (Extended MNIST)**

* 1. **Number of classes and their labels**

ANN:37 (balanced)

* 1. **Dataset Images Numbers and size**

ANN:

Train:88799

Test:14799

* 1. **Training, Validation and Testing**

ANN:

Train:88799

Test:14799

2. Implementation Details

* + 1. **Extracted Features**

28×28 bits

* + 1. **Cross-validation**

(Is cross-validation is used in any of implemented models? If yes, specify the number of fold and ratio of training/validation)

* + 1. **Artificial Neural Network (ANN)**
* **Hyper-parameters**

Optimizer :adam

Batch size:100

Epochs: 20

* + 1. **Support Vector Machine** **(SVM)**
* **Hyper-parameters**

(Specify all the hyper-parameters (optimizer, regularization, …) with their specified value in implementation)

3. Models Results

**For each model you should show all these results for your model on testing data** (loss curve, accuracy, confusion matrix, ROC curve)

* 1. **ANN ResultsA picture containing text, black, tiled, tile

     Description automatically generatedChart, line chart

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  2. **SVM Results**