

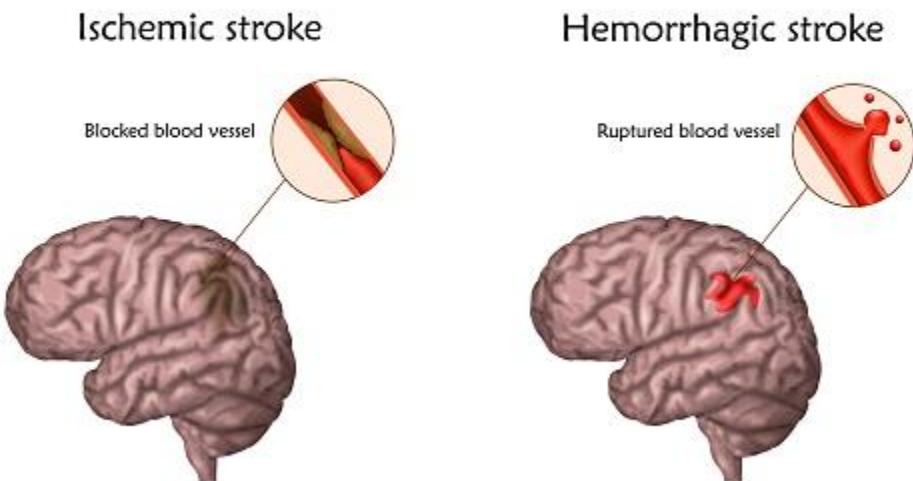


**Introduction to AI – Fall 2023**  
**Final Project**  
**Instructor: Dr. Shahab Nabavi**  
**Deadline: 1402/10/22 23:59**

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A stroke, also known as a cerebrovascular accident or CVA happens when a part of the brain is deprived of its blood supply and the part of the body that the blood-deprived brain cells control, stops. Loss of blood supply can be due to lack of blood flow or due to bleeding in the tissue. A stroke is a medical emergency because it may result in death or permanent disability. There are treatments for these types of strokes, but this treatment should be given in the first few hours with the appearance of stroke symptoms.

## Types of Stroke



**Figure 1: Types of Stroke**

In this project, you will work on a [Stroke](#) dataset including people's information and their history of stroke.

Do the Following steps:

**Step1:**

- a. Do Preprocessing part completely.

**Step2:**

- a. Split dataset into train, test, and validation sets with an appropriate ratio.

**Step3:**

- a. Choose one of the classification algorithm and train a model.
- b. Evaluate your chosen model.
- c. Plot the confusion matrix and explain it.

**Step4:**

- a. Build an artificial neural network. Explain the structure of your model. (Include the number of layers, number of neurons, type of activation functions, ...)
- b. Use Adam and RMSprop optimization algorithm and compare the results.
- c. Evaluate your ANN model and plot loss and val loss in terms of epochs.
- d. Plot the confusion matrix and explain it.

Note that you should deal with imbalanced data in this project.

Write a comprehensive report about what you did and why you did it.

Do this problem set in the Google Colab and submit the .ipynb file with the Google Colab link in [Courseware](#). You should put your notebook link in comment section.

Name your file like Final\_Project\_StudentName\_StudentId.

**GOOD LUCK**