**Cardiovascular Disease Classification**

* **Abstract**

**The goal of this project was to use machine learning classification models to predict and classify of cardiovascular and heart diseases characteristics and to detect it’s pattern before it might be happening for a patient by knowing the behavior and studying the cases and historical data that we have, the data was provided from Kaggle website for research purposes, we will be manipulating and feature engineer the data and prepare it for our classification model and start the predicting process, and then we will be doing the hyper parameters tuning for the finals classification models and see what is the best model in our case.**

* **Design**

**Like we said earlier that the goal of the model to create a classification report that will help us predict the patients who might face cardiovascular diseases and try to avoid it early, also at last we want to find the most important feature that affect on the cardiovascular.**

* **Data**

**The data set we have is containing 70,000 patients data or known as rows, and 12 columns or features, not all the data are categorical, some are numerical elements and some are categorical and we didn’t drop any columns only the Id column**

* **Algorithms**

**Feature Engineering**

**Not a lot of data cleaning we needed to do since most of the data are seems clear and ready for us, what we did is two things:**

1. **Converting age into years so it will be easier for the mode**
2. **Converting the 2 gender values into 0 since it will reduce model complexity**

**Models**

**In the modeling part, we created multiple models based on our classification model, and we choose the top 2 results to tune them and improve them, these two model were:**

1. **Logistic Regression (72%) Accuracy**
2. **Gradient boosting algorithm (73%) Accuracy**

**Tools**

* **Numpy**
* **Pandas**
* **Seaborn**
* **Scikit-Learn**
* **Matplotlib**
* **Powerpoint**
* **Communication**

**Part of handing the project, a presentation was created to deliver the business insights of the project and the models we created, below are screenshots with clear explanation of each slide.**



