Main Project

1. To project the growth (GDP per capita %) of an economy by looking at its economic freedom or some parts of the EF characteristics as parameters (Some research papers included government spending and freedom of access to education) and training the data on projecting everything 3 years. Looking at date time stamps from 2007 to 2019.
   1. Clean the data. Remove countries that do not have sufficient data or use the overall EF rating to fill the N\A scores.
   2. Preprocess the data to calculate the actual 3-year GDP per capita growth % for the countries we are looking at.
   3. Train the data to predict GDP per capita for one year. Validate by checking the next year for each country based on their new EF parameters. Do again for the next year.
   4. Train the data to predict the new EF scores. Do this for the next three years.
   5. Validate the training with predicting future EF and GDP per Capita growth.
   6. Use the future EF to predict future GDP per capita growth.
   7. Resources:
      1. Predicting GDP per capita movement trends based on access, spending, and years of education and a sub question.
         1. What classification algorithm performs best in distinguishing the up and down trends in economic growth based on access, spending, and years of education?
         2. In order to find a classification model that best fits the data to predict these trend movements a Logistic Regression (LR), K-Nearest Neighbors (KNN), Random Forest (RF) and a Support Vector Machine (SVM) were established and compared based on their performance.
      2. <https://www.heritage.org/index/book/chapter-4?version=290>
         1. Results between Economic Freedom and Standard of Living is below
            1. 
            2. Positive relationship between EF and Standard of Living (GDP per Capita) and we can compare our results with the website.
      3. PREDICTING GDP GROWTH IN MALAYSIA USING KNOWLEDGE-BASED ECONOMY INDICATORS: A COMPARISON BETWEEN NEURAL NETWORK AND ECONOMETRIC APPROACHES
         1. The paper proposes modifications to the neural network model to improve prediction accuracy.
         2. Presents a comparison between neural network and econometric approaches to predict GDP growth using k-economy indicators in Malaysia based on time series data collected from 1995–2000.
         3. Found that NN is more accurate by an extra 20% compared to Traditional statistical methods. Statistical methods: 62% and NN had 81% accuracy.
         4. The findings of this study show that it is possible to use a neural network to predict the GDP growth using knowledge based economy indicators. To improve the prediction accuracy, one possible way is to include other factors such as firm and industry market structure, demography and worker characteristics and price behaviors as suggested by Haltiwanger and Jarmin (1999).
         5. Conclusion: We can extend the research by including the above factors in point (4).

First meeting (1/26/2021)

1. Look for spending habits in different demographics.

2. RL is out of the picture.

3. GDP proposal voted by Ryan.

4. GDP proposal is chosen.

5. Begin with replicating previous models from other papers.

6. Begin homework’s 2 weeks early.

7. Use google colab.

8. Flesh out the ideas more by reading the papers and creating a detailed plan on how to approach the GDP problem.