Analyzing and Forecasting Unemployment over the world

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Overview

Analyzing and forecasting the unemployment rate all across the world. Dataset consists of data from the year 1991 to 2021. The purpose of the project is to analyze the trends and patterns of each country WRT each year. Checking which countries have seen adverse effects of unemployment over the past years. Checking how big economical countries are balancing unemployment over the years.

Forecasting the present data for predicting the unemployment rate of future years through time-series forecasting and necessary ML models.

Goals

There are several problematic statements that are explored and analyzed to check whether they turn out to be useful. They are

1. Pre-processing the data, arranging the data, cleaning the data.
2. Retrieve countries unemployment rate of every year WRT sub-regions, continents.
3. Countries that have the highest, lowest unemployment rate over years.
4. Major change of unemployment rates over 3 decades. I.e 1991-2000, 2001-2010, 2011-2020.
5. Top 10 countries controlling unemployment rate from the past one decade and also below 10 countries that have seen massive change in unemployment rate over the past 10 years (decade).
6. Mapping the average unemployment rate of every country in a world map for easier representation for non-technical clients.

There are several hypotheses taken into account and prove them to be valid. They are

1. **G20** countries are said to be in a better position in terms of controlling unemployment rate over the years.
2. There was a **Financial crisis**(2007- 2008) which affected many people and many lost their jobs which led to an increase in unemployment rate.
3. There was an **Asian crisis** in the year 1997 which affected many Asian countries resulting in an increase in unemployment rate.
4. **Covid 19** has affected many people's lives. Where many lost their jobs which resulted in an increase in unemployment rate in the year 2020.

Forecasting the future years unemployment rate using time series forecasting techniques.

1. Predicting the unemployment rate till 2030.
2. Splitting the dataset into two parts which consist of 1991-2020 in one set and 2021 is set as target variable. This regression model will eventually help countries understand till where the country's performance is .
3. Some countries can also manually enter their past years data to find the unemployment rate for the year 2021.

Data

This project uses two types of datasets. One contains all the countries all with their unemployment rate every year starting from 1991 to 2020. Second contains data which marks countries that belong to which continent and their sub-regions.

This data is taken from the World bank.

Milestones

I. Solving the given problem statements

Solving the given 6 problem statements marks the completion of 30% of projects. This makes use of understanding what kind of data is present. Patterns of data are analyzed.

II. Proving the given hypotheses to be valid and true

This marks the completion of 70% of the project.Working on the hypotheses. This will give a solution for the hypotheses. Which can eventually help in forecasting the future years. This section will help in decision making for many countries in tackling unemployment, mainly for smaller economical countries.

III. Forecasting using machine learning models.

This marks the completion of the entire project. With this future year's unemployment rate of every year starting from 2022 to 2030 is predicted and forecasted.

Using a regression model, the target variable(2021) is predicted and new countries data can be given in order to see the performance of the 2021 years data.