ALLIANCE UNIVERSITY

Private University established in Karnataka State by Act No.34 of year 2010
Recognized by the University Grants Commission (UGC), New Delhi

Celebrating 25 SILVER JUBILEE years of Alliance Education

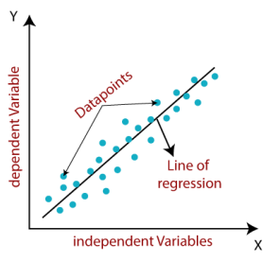
Machine learning mini project
Life Expectancy Analysis using Python

Abstract

Life Expectancy is an analytical as well as statistical measure of the longevity of the population depending upon distinct factors. Over the years, Life expectancy observations are being vastly used in medical, healthcare planning, and pension-related services, by concerned government authorities and private bodies.
Advancements in forecasting, predictive analysis techniques, and data-science technologies have now made it possible to develop accurate predictive models. In many countries, it is a matter of political debate about how to decide the retirement age and how to manage the financial issues related to the public matter. Life expectancy predictions provide solutions related to these issues in many developed countries.

Specify about data

- Country
- Year
- Status
- Life expectancy
- Adult Mortality
- infant deaths
- Alcohol
- percentage expenditure
- Hepatitis B
- Measles
- BMI
- under-five deaths
- Polio
- Total expenditure
- Diphtheria
- HIV/AIDS
- GDP
- Population
- thinness 1-19 years
- thinness 5-9 years
- Income composition of resources
- Schooling

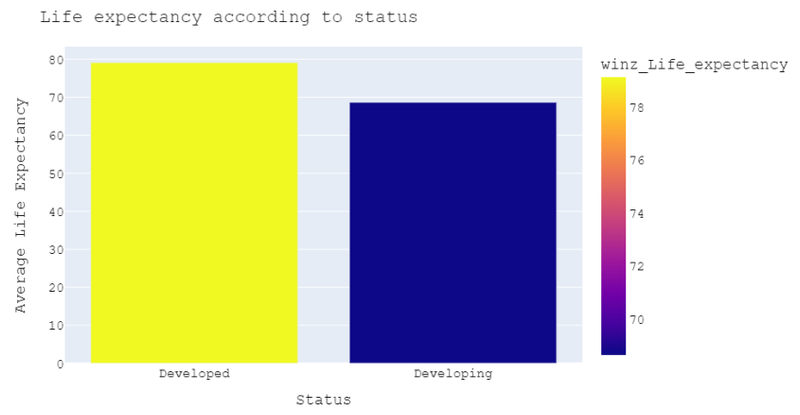


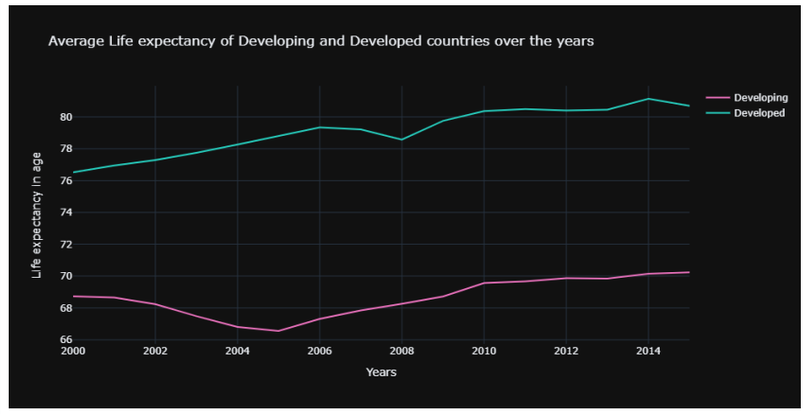
Code snipes:

```
•life_expectancy = pd.read_csv(r"C:\Users\hp\Desktop\python project\Life Expectancy Data.csv")
•life_expectancy.head()
•life_expectancy.describe()
•life_expectancy.columns
•life_expectancy.rename(columns = {" BMI " :"BMI",  "Life expectancy ": "Life_expectancy", "Adult Mortality":"Adult_mortality","infant deaths":"Infant_deaths","percentage expenditure":"Percentage_expenditure","Hepatitis B":"HepatitisB","Measles ":"Measles","under-five deaths ": "Under_five_deaths","Total expenditure":"Total_expenditure","Diphtheria ": "Diphtheria"," thinness  1-19 years":"Thinness_1-19_years"," thinness 5-9 years":"Thinness_5-9_years"," HIV/AIDS":"HIV/AIDS","Income composition of resources":"Income_composition_of_resources"}, inplace = True)
•life_expectancy.info()
•print(life_expectancy.isnull().sum())
•life_expectancy.groupby('Country').apply(lambda group: group.interpolate(method= 'linear'))

•status_life_exp = life_expectancy.groupby(by=['Status']).mean().reset_index().sort_values('winz_Life_expectancy',ascending=False).reset_index(drop=True)
•plt.figure(figsize=(20,10))
•fig = px.bar(status_life_exp, x='Status', y='winz_Life_expectancy',color='winz_Life_expectancy')
•fig.update_layout(title="Life expectancy according to status",xaxis_title="Status",yaxis_title="Average Life Expectancy",font=dict(family="Courier New",size=16,color="black") )
•fig.show()

•life_year = life_expectancy.groupby(by = ['Year', 'Status']).mean().reset_index()Developed = life_year.loc[life_year['Status'] == 'Developed',:]Developing = life_year.loc[life_year['Status'] == 'Developing',:]
•fig1 = go.Figure()
•for template in ["plotly_dark"]:
•  fig1.add_trace(go.Scatter(x=Developing['Year'], y=Developing['winz_Life_expectancy'],mode='lines',name='Developing‘,marker_color='#f075c2'))
•  fig1.add_trace(go.Scatter(x=Developed['Year'], y=Developed['winz_Life_expectancy'],mode='lines',name='Developed',marker_color='#28d2c2'))
•fig1.update_layout(height=500,xaxis_title="Years",yaxis_title='Life expectancy in age',title_text='Average Life expectancy of Developing and Developed countries over the years',template=template)
•fig1.show()
```





Explanation of the Model

some models are:
- Linear regression
- Ridge regression
- Decision tree
- Random forest

In that we are using linear regression in our modal.

Linear regression: Linear regression analysis is used to predict the value of a variable based on the value of another variable. The variable you want to predict is called the dependent variable. The variable you are using to predict the other variable's value is called the independent variable.

Conclusion:

The emergence of machine learning presents new techniques for intrusion detection systems in which various types of classifies have been adopted by researchers and scholars in building intrusion detection systems models

Refences:

- https://www.ibm.com/in-en/topics/linear-regression#:~:text=Resources-,What%20is%20linear%20regression%3F,is%20called%20the%20independent%20variable.
- https://link.springer.com/article/10.1007/BF00056139
- https://www.bmj.com/content/362/bmj.k2562

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