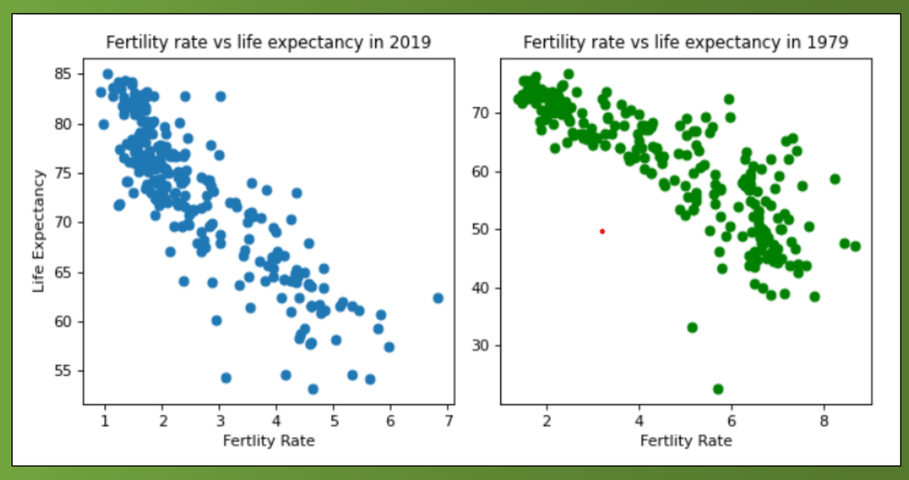
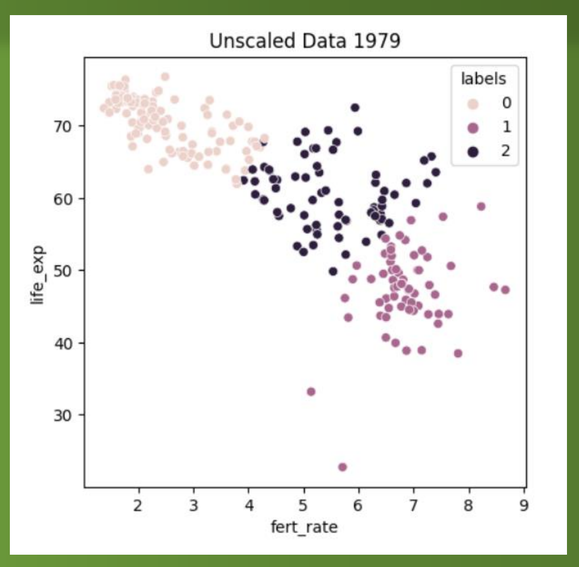
# Life expectancy vs Fertility Rate

- In the scatterplots we can see that there is a trend in life expectancy when compared with the fertility rate.
- The plots show that as the number of children increase the life expectancy decreases.
- If we compare the same plot for two years i.e, 1979 and 2019 which are 40 years apart, it is apparent that on an average the maximum number of children has been decreased from 8 to 6(almost).
- But it is hard to say if there is a difference between countries with high fertility or high population.
- By using clustering we can get some insights.




- The plot on the right side shows us the clustered data.
- Algorithm used: Affinity Propogation
- Number of clusters: Three (0,1,2)
- Type of Data: Unscaled (original)





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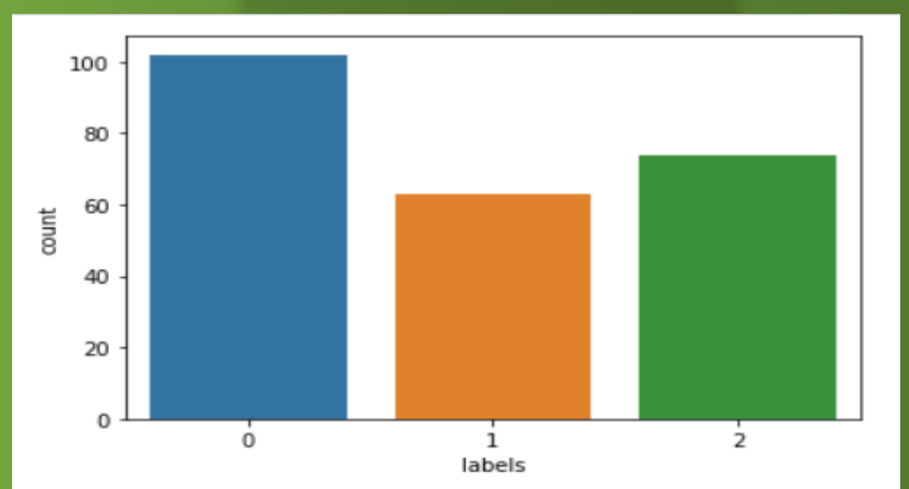
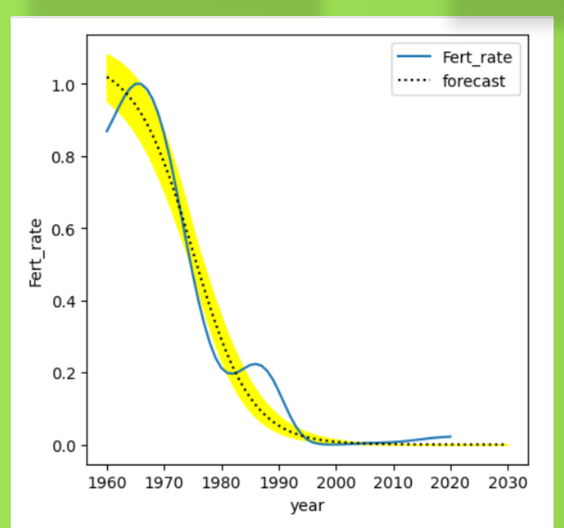
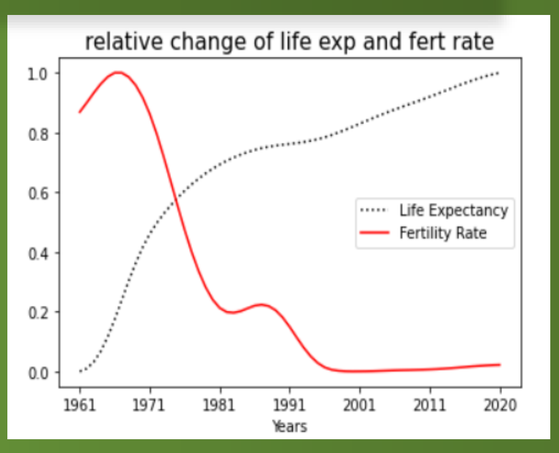
| labels | life_exp |
|---|---|
| 0 | 70.094311 |
| 1 | 47.255349 |
| 2 | 60.386310 |

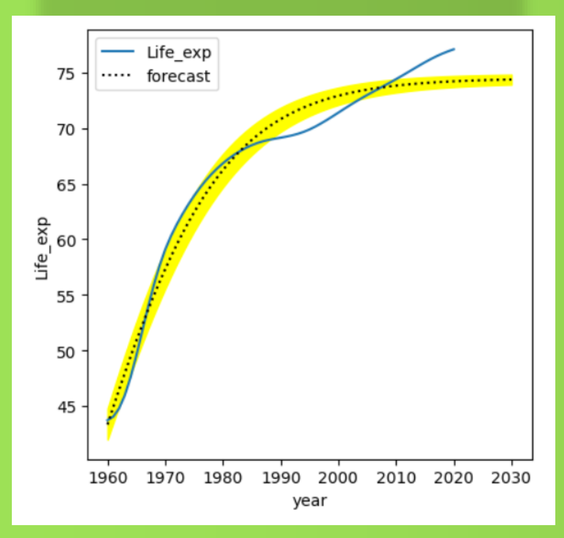
- The table to the left shows us the mean life expectancy of each group.
- It is apparent that the three groups have a significant differrence from each other.
- On the right hand side we can see the number of observations in each group.
- It means the countries the most number of countries are in the cluster 0 which has the highest average life expectancy.




- To the right we can see a line plot which shows relative change of two indicators:
  - Life Expectancy
  - Fertility Rate
- Both seem to be extremely negatively correlated to each other.
- This data is taken from world data bank website and the data is of the year 1979




- On the left hand side the bottom two plots show us the indicators with a logistic curve fitted to them .
- This curve helps us to approximately predict the future observations based on the given observations.
- The given observation range from 1960 to 2020, we are using it to predict observations for 10 more years.
- The dotted line is the curve and the yellow bar around the dotted line is the confidence interval of the fitted logistic curve.

- Student Name:
- Student ID:
- Module Name: