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| --- | --- | --- | --- | --- | --- |
| continent | meanExpect\_2018 | meanGDP\_2018 | varexp\_2018 | varGDP\_2018 | cor\_exp\_gdp\_2018 |
| Africa | 64.97 | 3967.80 | 31.34314 | 20411365 | 0.493479 |
| Americas | 76.70 | 13358.70 | 13.58167 | 1.19E+08 | 0.522536 |
| Asia | 74.45 | 14492.69 | 33.85644 | 2.13E+08 | 0.750333 |
| Europe | 80.11 | 26421.67 | 6.344379 | 1.32E+08 | 0.791173 |
| Oceania | 82.35 | 34100.00 | 0.605 | 76880000 | 1 |

Overall Average Life Expectancy – 72.63

Overall Average GDP – 13307.63

1. From the plots we can see that for the year 2018 the relationship between GDP and life expectancy can be explained using a linear regression line for all the continents. From table we can also observe good correlation (> 0.45) between the two variables for all the continents. We could observe the following pattern for the different continents-
   1. In Africa we can see GDP < 15000 and life expectancy < 75 for most of the countries. The mean Life Expectancy and GDP is lowest amongst all the continents, there metrics are also lower than the overall averages. Only a few countries are above the overall average for GDP – Botswana, Gabon, Libya and Mauritius; and only 3 countries – Algeria, Egypt and Mauritius are above in term of average Life Expectancy than overall average. From table, we can observe least variance in the GDP for countries in Africa continent.
   2. For America, we can see a couple of outliers – US, Canada for GDP which have values for GDP > 40k. The mean life expectancy if well above overall average, the GDP per capita is close to the world average. We see can a lot of countries in the range of 78-80+ for this continent which states that countries not just US and Canada, but others as well have a good status of health, this is also supported by the fact that variance for Life Expectancy is quite low. We can see a strong correlation (0.52) between the variable for this continent as well.
   3. We can see a lot of countries with a very high GDP in Asia, these values might have been reported wrongly as they don’t match with the data online. We can see a very high value of correlation between life expectancy and GDP for Asia (0.75), this can be evident from cases like Japan where life expectancy and GDP both are high and Afghanistan where both the metrics are low.
   4. We can see the highest mean values of life expectancy and GDP in the case of Europe and the value for correlation is also the highest for this continent indicating a strong relationship

The slope for the linear regression line between life expectancy and GDP is the highest for Africa indicating that Life Expectancy increase the most with increase in GDP in this continent. The pattern can be described using linear model for all the continents.

1. We can see form the plots that a linear model explains very well the increase in life expectancy for years after the second world war in 1945. This has been the case for all the continents, and we can see that all the continents have caught up in term of life expectancy except for Africa. We can observe a slight dip for Europe in years after the war, this could be because Europe was at the center of the war and could have suffered from the aftermath of the war. We can also see a slight upwards bump in case of Asia in the 1960s, this could be due to improvement of economy in the middle east due to the rise in exports of oil. There is a downwards bump for Asia prior to this period, this could be due to incorrect data as the magnitude of the bump is big. A liner model is enough to explain the increase in the life expectancy over the years. Overall we can say that the world is doing better than what it was in 1945 in terms of life expectancy . As evident from the table, we can see there is a lot of variation in the case of Asia for both life expectancy and GDP this is due to countries having extreme values for GDP like Afghanistan and the middle eastern countries, from the plot we can see the maximum amount of deviation from the standard regression line in case of Asia.