Maths Coursework: Planning

My task is about the statistics of life expectancy in Africa and Europe. My hypothesis is "people in Europe live longer then people in Africa". Other hypothesis I will add to this is "The higher the GNP the higher life expectancy?". First off I will collect data from the countries in Africa and Europe and decide a suitable sampling percentage and sample these at random. In order to complete the task I will need the life expectancy of people from countries within the respective continents and also the GNP per capita of the countries in the respective continents. All in all I should have over 30 countries so I think this will be enough to get me good results. I will collect the information form population data charity. information so it should be fairly reliable. I would like my data to be to one decimal place but two would I feel to be accurate and inappropriate for this task. With this data I will using standard deviation and graphs to present the data.

Working through the task

I will use many different types of calculations. In the following segment of my project I will show the different calculations and why I will use them.

Mean: the sum of all results divided by the number of results. This gives you a general average but doesn't account for if there is a anomalous result.

Mode: The most common result

Median: Place the results into numerical order and the number in the middle of this set is the median

Range: This is the range of the data from the lowest result to the highest

Frequency Density: I will use this as from this I can draw histograms. Frequency density you work out by dividing the frequency of the results by the range. This tells you how dense the range was.

Standard Deviation:

To apply this formula you subtract the mean from each value in the set of data and square the result. You then add all the results and divide by the number of entries in the set of data and finally you take the square root, the result is called standard deviation. This is a sophisticated way of measuring data. The larger the deviation the more spread the data.

Worked Example: To find the standard deviation on 3, 4, 7, 9, 12

Mean = $\frac{3 + 4 + 7 + 9 + 12}{5\text{(no. of results)}} = 5$

next step is to make a table

No.	No. - mean	$(\text{No} - \text{mean})^2$
3	-4	16
4	-3	9
7	0	0
9	2	4
12	5	25

So then $\sqrt{54/5} = 3.29$ (rounded to 3 significant figures)

So now we know the mean and the standard deviation.

I decided to use these techniques as I felt they were the techniques which would help prove or disprove my hypothasese.

In order to present this project I will show my results in easy to read tables, scatter charts, histograms, and pie charts. I will use these methods as they all show in different ways the results in comparison to the others.

Results/conclusions

All my results have been written and checked three times to conclude that they are accurate.

My first hypothesis was "people in Europe live longer then people in Africa". All my data agrees with my hypothesis. The mean, mode and median of life expectancy in European countries are significantly higher then those from the African set of results. Also the African Life Expectancy data had a higher standard deviation also showing the data was more spread. Linking this to my second hypothesis "The higher GNP the higher life expectancy". So from my results showing that Europes Life expectancy is higher then Africa's the GNP in Europe should according to my hypothesis be higher as well. Again my hypothesis was correct. As the mean, mode and median of the GNP in Eurpoean Countries was higher again compared to their African counterparts. However they were some exceptions like the Seychelles, this has a much larger GNP compared to the other African countries but its life expectancy is also considerably higher then the mean for

Africa. I feel I could have improved my working of the task if the data was more up to date and also included all the countries within both continents so all the figures got from my original data would be more accurate.

Countries missing from the data:

Cape Verde
Cote d'Ivoire
Gambia
Ghana
Liberia
Mali
Mauritania
Niger
Burundi
Comoros
Djibouti
Erithrea
Gabon
Sao Tome and Principe
Zaire
Western Sahara
Lesotho

African

Estonia
Finland
Lativa
Lithuania
Albania
San Marino
Slovenia

European