**Happy Planet Index – Part I**

“The Happy Planet Index” was a presentation given by Nic Marks in a 2010 TED talk[[1]](#footnote-1). One of the key points of the talk was that well-being of the people in countries should be measured instead of measuring economic information on the countries. One variable that captures the well-being of people is called the Happiness variable. According to the Happy Planet Index: 2012 Report[[2]](#footnote-2), “The Happy Planet Index (HPI) is an efficiency measure which captures the degree to which long and happy lives are achieved per unit of environmental impact.” Large values of the Happiness variable indicate greater happiness, health, and well-being of the country’s citizens.

In this activity, you are going to be looking at data from 143 countries and examining how well the Life Expectancy variable predicts the Happiness variable.

**Research Question #1:** What is the relationship between Life Expectancy and Happiness?

**Discuss the Following Questions**

1. Which variable is the response variable? How do you know?
2. Which variable is the explanatory variable? How do you know?
3. Describe the type of relationship you think exists between the Life Expectancy variable and the Happiness variable.

* Open up the data set: *HappyPlanetIndex-Part-I.csv*.
* Use the statistical software of your choice (e.g., R, SAS, StatCrunch) to produce a scatterplot of *Happiness* verses *Life Expectancy*.

1. Sketch a scatterplot of the *Happiness* verses *Life Expectancy*.
2. Describe the relationship between Life Expectancy and Happiness for the countries. Is the relationship what you expected?

* Use the statistical software of your choice (e.g., R, SAS, StatCrunch) to compute a correlation between *Happiness* and *Life Expectancy.*

1. Report and interpret the correlation between *Happiness* and *Life Expectancy*.
2. Does there appear to be a country that is an outlier in comparison to the rest of the points? If so, identify the country that appears to be an outlier.

Suppose there was an error in data entry, and the country you identified above should have a Happiness rating of 2.4. Go into the data and change that country’s Happiness rating so it reflects the actual Happiness rating.

1. Predict how the correlation will change when you fix the error in the data entry.
2. Reproduce the scatterplot and the correlation for the corrected data set. How did the correlation between Life Expectancy and Happiness change?
3. Provide an answer to the research question.

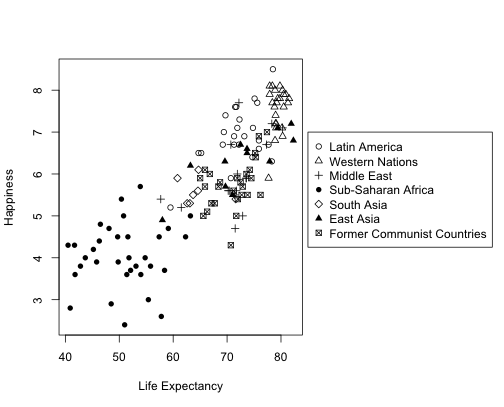
**Research Question #2:** How well does Life Expectancy predict Happiness?

* Use the statistical software of your choice (e.g., R, SAS, StatCrunch) to produce a least squares regression line to predict *Happiness* from *Life Expectancy*.

1. Report the least squares regression equation below.
2. What is the interpretation of the intercept value in the context of the problem?
3. What is the interpretation of the slope value in the context of the problem?
4. Let’s say a country not in our data set had a Life Expectancy rating of 62.8. What is the predicted Happiness rating for a country for that country?
5. Calculate the residual value for the United States. How would you interpret this value?

**EXTENSIONS**

1. If someone wanted to predict Happiness for a country that had a Life Expectancy of 90, what would you tell them?
2. Would you classify the outlier that you identified in question 7 an influential point? Why or why not?
3. If the outlier that you identified in question 7 was a real data value, should you delete that observation from the data set before proceeding with the analysis? Why or why not?
4. The scatterplot below displays Happiness verses Life Expectancy and classifies each country by its region. If you were to describe this plot to your friend, what would you say?



1. See <http://www.ted.com/talks/nic_marks_the_happy_planet_index.html> for the actual TED talk. [↑](#footnote-ref-1)
2. (2012). Happy Planet Index: 2012 Report. *nef*. Retrieved from <http://www.happyplanetindex.org/assets/happy-planet-index-report.pdf> [↑](#footnote-ref-2)