

# **Providence Extension Program**

## **Mrs. Norris**

### **Honors Statistics**

### **Project #2 Packet**

Statistics looks at the ways people analyze information, find relationships between variables, design and carry out experiments, and quantify the reliability of the conclusions they draw. Starting from the basics that virtually every student already knows about Statistics – like mean and median, bar graphs and scatter plots – the students in this class will explore deeply into the less known realms of analysis. There is much to learn, and each class session will require students to work diligently, both during and outside of class.

There is no reason that this learning process cannot be fun, interesting, and highly rewarding. Every effort is made to design activities that are relevant, timely, and that stimulate the curiosity of the Statistics student. Rather than studying mostly made-up or copied data, we will be generating the data we use by experiment and by looking at the topics that interest the class.

Part 1: "Exploring Relationships between Variables" task;

Part 2: Challenges you to analyze a data set using basic calculations and graphics;

Part 3: Requires that you keep track of a variable during our first semester.

## Part 1 – Exploring Relationships between Variables

To complete this part of the project, you will need to get on the Internet and go to [Gapminder.org](http://Gapminder.org).

Select the “Gapminder World” panel, and the scatterplot should load. You are looking at worldwide data of Life Expectancy vs. Per Capita Income. Point your cursor at the x-axis or y-axis labels to get more information about these variables. Every colored circle on the graph represents a country. Point the cursor at various circles, and the name of the country will appear. Look at the world map in the upper right as you point the cursor at a country, and the region of the world will become highlighted. You can figure out the color-coding that way. The size of each circle is proportional to that country’s population – look in the lower right corner to see each country’s population as you point the cursor at it.

One fun thing you can do with the scatterplot is to slide the year indicator back to the first year that data was recorded (1950 for this combination of variables), and then click on “Play” to watch the change in the scatterplot, year by year, from that year to the present. Even more fun is to select one or more countries (this causes all the other countries to dim into the background), and watch the track made by the selected countries over time.

### ***Answer the following questions:***

What is the relationship between Per Capita Income and Life Expectancy in the world?

Which countries are the farthest from the pattern showed by the rest of the world?

Which country has the highest life expectancy now? Which has the highest per capita income?

Which has the lowest income? The lowest life expectancy?

Which group of countries (by color) has gained most since 1950 relative to the rest of the world, in both income and life expectancy?

What changes has China experienced in income and life expectancy, since 1950?

Watch the “track” of Rwanda from 1950-2005. What events in Rwanda might explain the unusual changes that happened?

## Part 2 – Analyzing a Data Set

The following data represents the final year averages for the 29 students in Statistics last year. If you have any difficulty with the calculations, graphics, or vocabulary on this page, use resources (Internet, library, humans) to find the help you need. Your graphing calculator can make some of the questions easier, but you have to discover how. Enjoy!

78.6 78.1 89.0 83.2 91.4 80.2  
91.8 93.7 80.1 74.3 92.9 89.9  
78.3 79.9 83.0 87.9 93.2 78.5  
96.1 100.8 84.4 95.3 100.8 92.9  
89.6 76.5 83.9 84.3 94.0

**Organizing Data** (choose one from the options given)

Organize the data into a Dot Plot, Stem-and-Leaf Plot, or Interval Frequency Table.

**Central Tendency**

Find the mean and median of the data. Which one (mean or median) do you feel best represents the data set? Why?

**Data Set Graphics**

Make a Box-and-Whisker Plot and a Bar Graph to illustrate the data set. What observations can you make about the data?

**Dispersion**

Calculate the range and the standard deviation of the data set. Do you think there are any “outlier” values in the set? Why?

## Part 3 – Tracking a Variable

Pick a variable to keep track of during the 1st and 2nd quarters. You must track it for a minimum number of 45 consecutive days. It could be any number that changes from day to day: the high temperature in Jacksonville, the number of home runs hit in the major leagues, the value of a particular stock, how many hours you slept. Ideally, it should be something *you* find interesting and are genuinely curious about.

Then prepare the following to turn in before we depart for Christmas Break:

- 1) Use the open space below to record the daily values of your selected variable;
- 2) As the end of quarter 2 approaches, make a line graph that shows the changing value of your variable (the x-axis is the date and the y-axis is the variable value; each day is a point on the graph, points are connected from one day to the next by line segments); and
- 3) Then write a few paragraphs describing what you did and what conclusions you draw from the data.

Variable Name \_\_\_\_\_

Values (ordered chronologically)