Math 105: Math in Modern Society
Instructor: Prasad
Section 003

Statistics Mini-Project

This assignment is worth **20 points** – the same as TWO homework assignments, since it takes the place of both one day's worth of classwork and one night's homework.

Part 1: Collecting Data

- Create a one-question survey that collects some form of **numerical** (quantitative) data.
- Choose and implement a sampling method. Your sample size should be at least 20.
- Conduct your survey.

Part 2: Summarizing Data

- Create a frequency table from your data.
- Calculate the mean and standard deviation of your data set.
- Find the median and first and third quartiles of your data set.

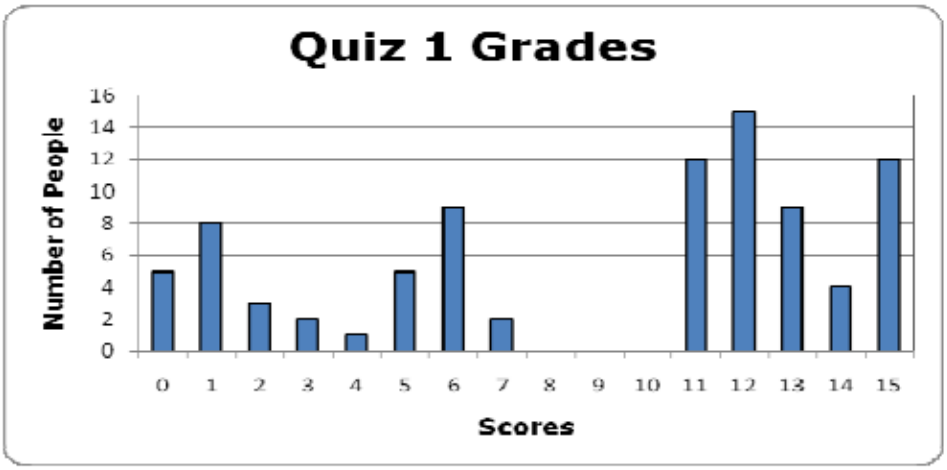
Write-up:
This should be typed, single-spaced, proofread, and written in complete sentences. Your write up should include:

- The exact statement of the question you asked.
- Careful descriptions of the target population, the sampling frame, the sample, and the sampling method you chose and *why.*
- Explanations of any biases your study might be vulnerable to. If you claim that there is no sampling bias at all, justify this claim! Explain thoroughly why you believe this to be true.
- Include the mean, standard deviation, and five-number summary of your data set.
- Include the frequency table you made earlier.
- Four graphical summaries of your data: a bar graph, a pie chart, a histogram and a box plot. If you do these by hand, they must be extremely neat. If you want to do these on the computer, there is an example on the next page with directions.
- What can you conclude from your survey? Explain thoroughly.
- Add a page at the end which lists your entire data set. This can be typed-up, or it can just be the paper you used to collect the data.

Example for using Microsoft Excel

Suppose we have the scores on a 15-point quiz. In Excel, the scores are listed in Column A and the frequency of each score is shown in Column B.

Column A	Column B
0	5
1	8
2	3
3	2
4	1
5	5
6	9
7	2
8	0
9	0
10	0
11	12
12	15
13	9
14	4
15	12



To make a chart: Highlight the output, **Column B**. Now click on the **Insert** tab. The third group from the left is marked **Charts**. Click on **Columns**, pick the top left in the 2D column, called **Clustered Column**. A chart is made, but it contains the default horizontal values and has no titles.

Add a title: Right click on the graph in the plot area left click select data, highlight **Series 1**, and click **Edit**. Type in "Quiz 1 Grades" for **Series Name Title** and click **OK**. This places a title. On the right side, you will see a legend marked **Quiz 1 Grades**. Since we only have one set of data, remove this legend. Click on this box and delete.

Add the correct horizontal values: Right click on the graph. On the right side, click **Edit Horizontal** (if not there click on **Data Source**, then in the right box under horizontal, click on **Edit**). Highlight **column A**, click ok. Your horizontal values should be correct.

Add the horizontal and vertical titles: Click on the graph, click on the **Layout** tab at the top (not **Page Layout** tab). In the box marked labels, click on **Axis Titles.** Pick **Horizontal Title** option, choose **Horizontal** below the data, type "Scores" into the box provided. Go through this part again but pick **Vertical Title** option, choose **Rotated Title**, and type "Number of people" in the box provided.

To make black lines around each bar: Right click a bar in the chart, then select **Format Data Series**, pick **Border Color** and click on **Solid Line**. The default color is black. Now on border style you can change the width and types of line.

To change a bar graph into a histogram: You make the bar graph first, follow all the steps above and make sure you make black lines around your bars. Click on one of the bars, select **Format Data Point**. Change gap width from **150%(default)** to **0**. Click **OK**.