**Homework 02.**

In this assignment you will get practice using Excel to answer questions about real-world data.

**Assigned: 29 August 2017**

**Due: 5:00PM PST, 5 September 2017**

**Instructions: There are ten multiple choice questions. To receive credit, EMAIL your solution by the deadline to** [**tony\_statman@yahoo.com**](mailto:tony_statman@yahoo.com) **according to the following instructions:**

* The SUBJECT LINE must be “GSBA545 **HW02 for [Last name, First name] –** “ and then the ten letters corresponding to your answers; so, for example, if your name were John Doe, and you believed the answers were ABCCDCABED, then the subject line of the email must be “GSBA545 HW02 for **Doe, John - DACADADBED**”
  + Note that there is not a space between “GSBA” and “545”
  + The ten characters of your answer should have no spaces in between
  + If you submit less than 10 letters, it is assumed that the first letter corresponds to your answer to the first question, etc.
* The FIRST LINE of the body of the email should be your last name, your first name, and your student ID
* The SECOND LINE of the body of the email should be five letters, corresponding to the answers to the five questions (make sure your answer consists of five characters)

**For example, a typical email might be**

From: John Doe <john.doe@usc.edu>

To: tony\_statman <tony\_statman@yahoo.com>

Subject: GSBA545 HW02 for Doe, John - DACADADBED

DOE, JOHN 123456789  
DACADADBED

On 2 June 2017, an analyst estimated that possible returns for the S&P500 for June 2017 had the following distribution:

* 4.3% of the possible returns for June 2017 were –5.0% or less
* 29.8% of the possible returns for June 2017 were between –5.0% and –1.0%

[see <https://seekingalpha.com/article/4078283-odds-favor-1-percent-5-percent-change-s-and-p-500-june-direction> ]

1. If the possible returns for the S&P500 for June 2017 follow a normal curve, what percentage of returns fall between +1.0% and +5.0%?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. 29.8% | 1. 31.0% | 1. 34.3% | 1. 36.9% | 1. 39.5% |

1. The actual return for the S&P500 for June 2017 was 0.32%. Based on the assumption that possible returns follow a normal distribution, did the market perform about as well as the analyst predicted, better than the analyst predicted, or worse than the analyst predicted?
2. Much better than the analyst predicted: 0.32% was more than two SD’s above the mean predicted by the analyst
3. Better than the analyst predicted: 0.32% was more than one but less than two SD’s above the mean predicted by the analyst
4. About as well as predicted: 0.32% was within one SD of the mean predicted by the analyst
5. Worse than the analyst predicted: 0.32% was more than one but less than two SD’s below the mean predicted by the analyst
6. Much worse than the analyst predicted: 0.32% was more than two SD’s below the mean predicted by the analyst

Data are available for 262 cities that had one or more murder in 2012 (<https://lawstreetmedia.com/fbi-uniform-crime-report-2012/> )

1. If one were to construct a histogram of “number of murders in 2012, by city”, what would be the best way to summarize the histogram? Choose the best answers.
2. Skewed to the left
3. Skewed to the right
4. Symmetric but with outliers
5. Normally distributed with an average of 29.3
6. Uniformly distributed between 1 and 500
7. What is the correlation between “number of murders” and “population”?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. 0.0763 | 1. 0.5503 | 1. 0.6943 | 1. 0.7435 | 1. 0.8154 |

1. Some cities had exactly one murder. How many states had at least one city with exactly one murder?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. 4 | 1. 12 | 1. 13 | 1. 8 | 1. 22 |

1. A friend wants to know what city is “riskiest” with respect to murder. Which of the five choices below would you say is the most dangerous with respect to murder?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. Chicago, IL | 1. Flint, MI | 1. New York, NY | 1. Plano, TX | 1. Tyler, TX |

Data are available from the National Longitudinal Study of Youth (NLSY). Summary data are available for college graduates from ten college majors (excluding engineering); for each major, data are available for the graduates’ average college GPA, their average annual income, average SAT math score, average SAT verbal score, and number of students who had chosen that major (<https://www.iwu.edu/economics/PPE17/oehrlein.pdf> ).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Major** | **Average GPA** | **Average Income** | **Average SAT Math** | **Average SAT Verbal** | **Sample Size** |
| Biology | 3.171 | $ 16,692 | 567.55 | 554.79 | 113 |
| Business | 3.054 | $ 23,733 | 537.62 | 520.03 | 459 |
| Communications | 3.057 | $ 19,612 | 529.08 | 535.20 | 133 |
| Computer Science | 3.015 | $ 24,623 | 571.51 | 537.79 | 152 |
| Criminology | 2.992 | $ 21,170 | 448.68 | 477.63 | 96 |
| Education | 3.101 | $ 17,817 | 493.50 | 500.00 | 218 |
| Art | 3.183 | $ 17,969 | 564.10 | 576.92 | 127 |
| Nursing | 3.140 | $ 19,502 | 531.75 | 522.22 | 129 |
| Health | 3.106 | $ 20,640 | 535.96 | 530.70 | 121 |
| Psychology | 3.200 | $ 17,167 | 554.08 | 579.59 | 141 |

1. What is the correlation between “average college GPA” and “average income” for the ten majors? Choose the answer closest to correct.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. -0.1 | 1. -0.2 | 1. -0.8 | 1. 0.5 | 1. 0.9 |

1. If you knew that the average GPA from students of a certain college major was 3.179, what would you predict for the average income for students with that major, based on the above data?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. $17,603 | 1. $19,893 | 1. $29,693 | 1. $112,000 | 1. $206,392 |

1. What is a “reasonable guess” for the average error when predicting average income for a given college major?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. $551 | 1. $1744 | 1. $2692 | 1. $5515 | 1. $851 |

1. True or false: these data show that working to have a higher GPA (e.g., studying for tests, etc.) within a given major results in lower income, on average. Choose the best response.
2. Yes, because the correlation is negative and the sample sizes are large.
3. Yes, because the major with the highest GPA (Psychology) had a below-average income, and the major with the lowest GPA (Criminology) had an above-average income.
4. No, because the two majors with about-average GPA’s (Education and Health) had about-average incomes.
5. No, because GPA is confounded with choice of major and SAT score.
6. No, because even though the slope is negative, there are only ten majors listed, so the sample size is too small.