**Due: Feburary 21, 2018**

ASSIGNMENT #4 BIOSTATISTICS

**Name:**

**ID#:**

ASSIGNMENT 4 PUHE 6003/MEDC6925

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*Office: Public Health and Primary Care Unit, Faculty of Medical Sciences, EWMSC*

***Due: March 31, 2021***

Instructions:

Note your assignment is in two parts.

**Part I:**

This is on Socrative. Use the [student login](https://b.socrative.com/login/student/).

Your Room Name is : **PUHE6003**

**Part II:**

See below. Please answer all questions.

Provide working and sketches where necessary.

Submit your completed assignment to **myElearning**.

Part I1: 15 marks each

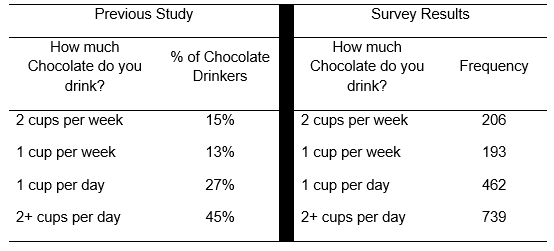
1. You have just completed a study of a random sample of person over 65 with pain from osteoarthritis treated with acetaminophen, ibuprofen, or codeine. The study results for pain improvement are displayed below.

Is there enough evidence, at the **0.05** level of significance, to conclude that the treatment and result are independent?

[Remember to state if the assumptions hold, display a sketch, state your decision and provide an appropriate conclusion, with the evidence.]

|  |  |  |
| --- | --- | --- |
| Treatment | Pain Improvement | |
| Significant | Slight |
| Acetaminophen | 48 | 42 |
| Ibuprofen | 81 | 25 |
| Codeine | 51 | 39 |

1. A conducted a survey of 1600 chocolate drinkers asking how much chocolate they drink in order to confirm previous studies. Previous studies have indicated that72% of Trinis drink chocolate. The results of previous studies (left) and the survey (right)are below.



At α= 0.10, is there enough evidence to conclude that the distributions are the same?

1. What is the null and alternative hypothesis?
2. State the level of significance and find the degrees of freedom.
3. Calculate the test statistic.
4. Find the critical value and provide and appropriately labelled sketch.
5. Is there enough evidence to reject the null hypothesis? What is your decision and conclusion?
6. The results for several patient’s height and pulse rate is given below:

Height (inches`) | 68 72 65 70 62 75 78 64 68  
Pulse rate (per min) | 90 85 88 100 105 98 70 65 72

* 1. Construct a scatter plot and interpret the plot.
  2. Find the linear correlation coefficient *r* and interpret this result.
  3. Is this a significant correlation? State the appropriate hypothesis and test the correlation using the *p-value* or the *critical value(s)* method at an appropriate level of significance. Interpret your findings.
  4. If appropriate, find the linear regression equation that describes this correlation.

1. There is the general perception that young adults typically exercise on an evening, equally throughout the week. You think there is likely to be an evening that young adults exercise most.

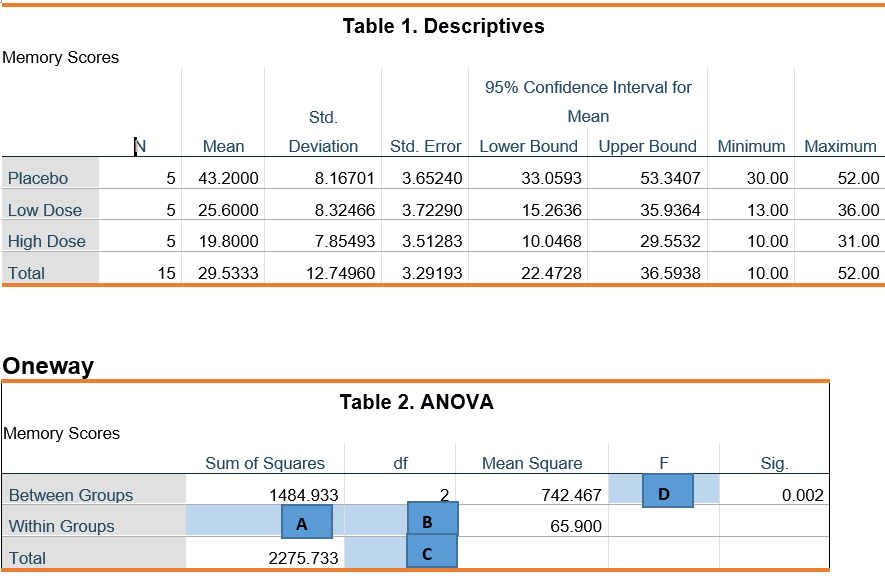
You ask a random sample of 49 youth which week evening they exercised most. The results were distributed as shown in the table.

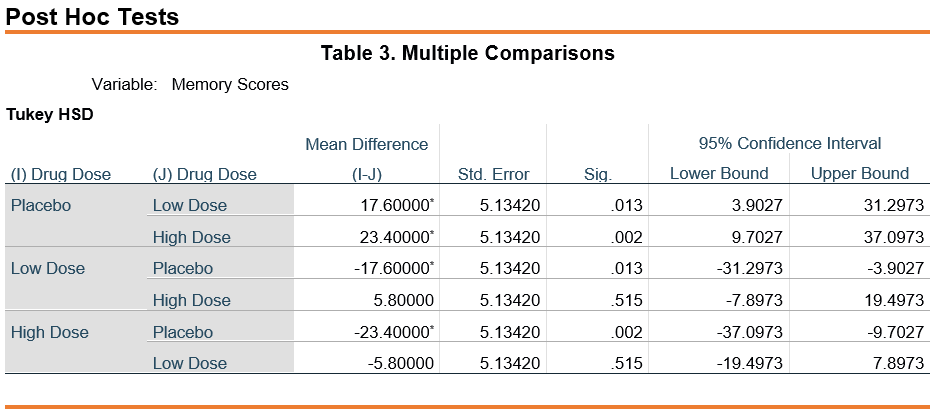
|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
| Number of Youth | 13 | 10 | 12 | 9 | 12 | 7 | 7 |

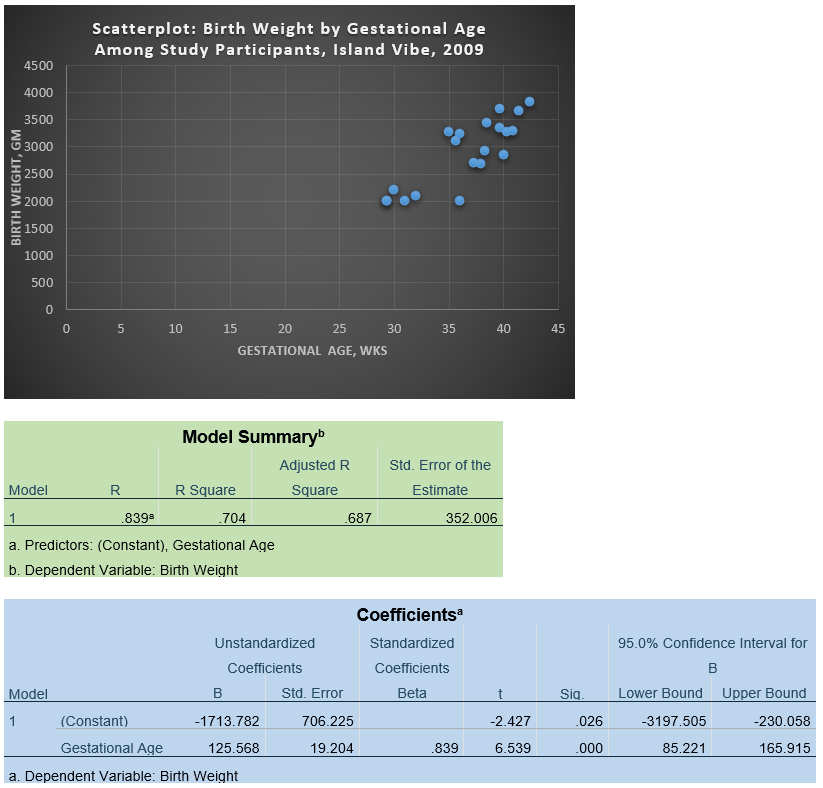
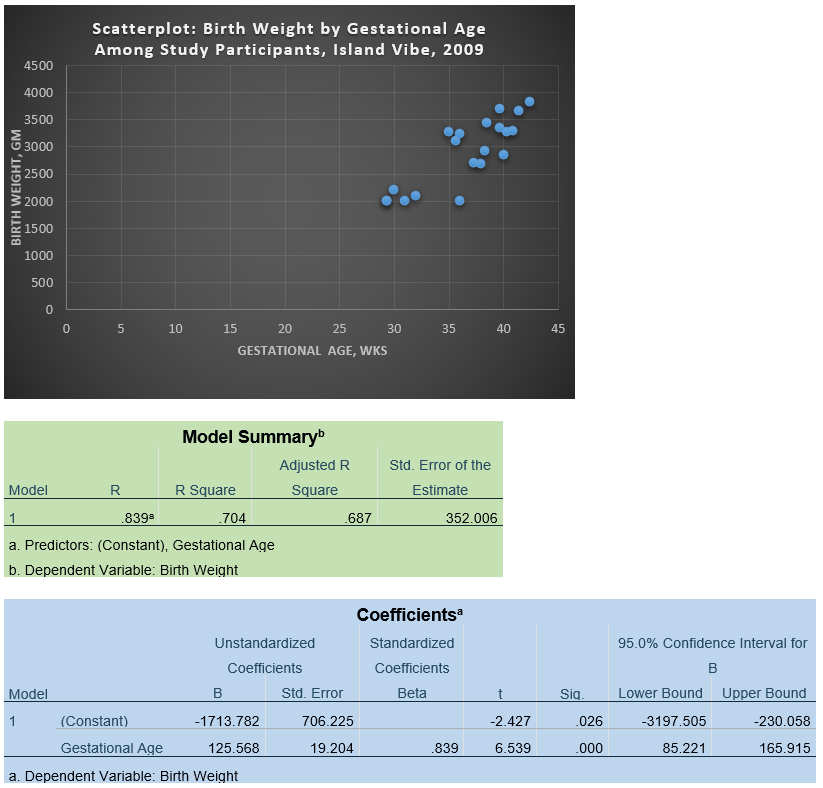
From the population of youth (that the sample was taken), do the evenings for which youth are doing the highest number of exercise, occur with equal frequencies during the week?

1. What is the null and alternative hypothesis?
2. State the level of significance and find the degrees of freedom.
3. What is the expected frequency for each of the seven categories?
4. Calculate the test statistic.
5. Find the critical value and provide and appropriately labelled sketch.
6. Is there enough evidence to reject the null hypothesis? What is your decision and conclusion?
7. A study examines the clinical effect of a treatment drug on the memory of a sample of Alzheimer’s patients. The data are presented below. Examine the SPSS output below and determine:
   1. What are the dependent and independent variables being examined?
   2. Using descriptive statistics from Table 1, describe the main results related to the stated variables in the study. Include the sample size(s), the observed measures of central tendency and their corresponding measure of variability, and incorporate the minimum and maximum values.
   3. Examine Table 2.
      1. What hypothesis is being stated?
      2. What are the values of the colured boxes A, B, C AND D?
      3. What is the decision and conclusion based on (a) the critical value method and (b) p-value method?
   4. Is there a need to perform the Tukey Post Hoc Test? If yes, (a) why and (b) using Table 3, where do the differences exist?

[Ensure you provide cohesive summary statements with supporting evidence]





1. Using the SPSS output below, write a summary paragraph to report on this simple linear regression.   
    Ensure that you incorporate: what is being investigated, the results of appropriate tests of assumptions, if a correlation exists, is it justified to establish a regression, test of correlation/slope, the variability explained by the model, etc.   
   (No calculations required)

