**Part 1**

In Part 1 of the assignment, please choose the best response for each question. In each question, only one response is correct. Use the grid at the end of this section to record your responses. Each correct answer is worth one point. This section is worth 10 points.

1. A researcher wanted to study if interacting with a dog was linked to happiness. She recruited 30 participants and tested their happiness both before and after interacting with a dog. The researcher hypothesised that interacting with a dog would increase happiness. Which statistical analysis should she use?
2. A between subjects one-way ANOVA
3. A paired samples t-test
4. An independent samples t-test
5. A 3 x 2 mixed ANOVA
6. A researcher devised a two-week intervention to help children with poor reading skills gain new vocabulary. After two weeks, the researcher compared the new vocabulary learnt by the intervention group to the number of new words learnt by a control group of children. The researcher hypothesised that the intervention group would learn more vocabulary words than the control group. Look at the output below and choose the correct way to report the result.

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1. *t*(38) = 2.88, *p* = .006
2. *t*(38) = 2.88, *p* = .003
3. *t*(37.99) = 2.88, *p* = .006
4. *t*(37.99) = 2.88, *p* = .003
5. An educational psychologist believes that an individual’s reading speed (in words per minute) and general comprehension abilities (scored out of 10) may be related to how well they do on a timed exam. To study the relative importance of these variables and the association between them, she runs a multiple regression. She produces the following predictive model for exam score:

Exam Score = 6.19 + (1.2\*Reading Speed) + (4.6\*Comprehension)

What exam score would you expect students to achieve if they have a reading speed of 250 w.p.m. and a comprehension score of 6?

1. 66.44
2. 16483
3. 78.17
4. 333.79
5. A private education company proposed an intervention programme to a school. The programme is designed to lower anxiety in children. The programme would take up a significant amount of the school’s budget. The education company provided the results of a study showing that anxiety levels decreased in their intervention group compared to a control group of children. The results of the *t*-test are*t*(6764) = 2.30, *p* =.02, *d* = .01. Given this result, what should the school do?
6. Instigate the intervention programme because it resulted in a statistically significant, large decrease in anxiety.
7. Decline the programme because the results of the study were not statistically significant.
8. Decline the programme because it had only a very small impact on anxiety reduction.
9. Decline the programme because the sample size of the study was very small.
10. A researcher investigated whether a measure of general anxiety and scores on a maths test would predict students enjoyability ratings of their statistics module. They ran a multiple regression analysis and gained the following output:

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Which statement best sums up what the research has found here?

Select one:

1. The model explains 60% of the variance in the data and is a significant predictor of enjoyability
2. The model explains 60% of the variance in the data and is not a significant predictor of enjoyability
3. The model explains 22% of the variance in the data and is not a significant predictor of enjoyability.
4. The model explains 22% of the variance in the data and is a significant predictor of enjoyability
5. When conducting an independent samples t-test the following should be conducted to assess that the groups have homogeneity of variance.
6. The Shapiro-Wilk test using the data from both conditions
7. The Shapiro-Wilk test using the difference scores found by subtracting the scores from both conditions.
8. Levene’s test
9. Mauchly’s test
10. A researcher wanted to test whether wellbeing is impacted by the type of animal owned as a pet. Participants were asked what type of pet they owned (dog, cat or fish), with any participants that owned more than one of these species of animals being excluded from the dataset. Participants were also asked to fill out a measure of general wellbeing, whereby higher scores indicate greater wellbeing. The researcher hypothesised that owning a dog or cat would be linked to greater wellbeing than owning fish. Look at the output from SPSS below and use the answer that best represents the results.

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1. Wellbeing was significantly higher in people who owned fish compared to people who owned a cat. There was no significant difference in wellbeing between people who owned fish and people who owned a dog
2. Wellbeing was significantly lower in people who owned a cat compared to people who owned a dog.
3. Wellbeing was significantly higher in people who owned either a dog or a cat compared to people who owned fish. There was no significant difference in wellbeing between people who owned a dog and people who owned a cat
4. Wellbeing was significantly lower in people who owned either a dog or a cat compared to people who owned fish. There was no significant difference in wellbeing between people who owned a dog and people who owned a cat
5. Which of the following assumptions would you need to test before you interpret the results of a 3 (within-subjects variable) x 2 (between-subjects variable) mixed ANOVA? Select one:
6. Sphericity
7. Both sphericity and homogeneity of variance
8. Homogeneity of variance
9. Neither sphericity nor homogeneity of variance
10. Identify the distribution with the LARGEST standard deviation.

Histogram

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1. A
2. B
3. C
4. D
5. A researcher runs a multiple regression and finds that her Durbin-Watson statistic is 3.5. This is an example of…
6. Lack of independence of errors
7. Linearity
8. The presence of an outlier
9. Multicollinearity

|  |  |  |
| --- | --- | --- |
| Question | Answer | Mark awarded |
| 1 | b |  |
| 2 | a |  |
| 3 | d |  |
| 4 | c |  |
| 5 | c |  |
| 6 | c |  |
| 7 | d |  |
| 8 | b |  |
| 9 | c |  |
| 10 | a |  |
|  | TOTAL |  |
|  |  |  |

Part 2

In Part 2, you are provided with the SPSS output for a statistical test. Use the data below to help answer the questions. This section is worth 10 points.

A researcher wants to find out if people feel calmer when in green spaces (e.g., a forest or park) vs. blue spaces (e.g., by the ocean). On day one, half of the participants sat for 30 minutes in a green space such as a forest or park, whilst the other half of participants sat for 30 minutes in a blue space such as a beach or by a lake. Then, the participants swapped around for day two. So, participants who experienced the green space on day one now experienced the blue space on day two, and participants who experienced the blue space on day one now experienced the green space on day two. So, each participant got to experience both a green and a blue space for 30 minutes each. On each day, the researcher measured how much participants reported feeling calm directly after experiencing the green or the blue space. The SPSS outputs for the analysis are copied below. The researcher was unsure if the green or blue space would cause greater feelings of calm, and therefore used a non-directional hypothesis.

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**Answer the following questions:**

How many participants took part in the study? (1 point)

Ans) 20 participants took part in the study .

What test did the researcher carry out? (1 point)

Ans) The test that the researcher employed to conduct the analysis was the paired sample t-test..

Are the difference scores normally distributed? How can you tell? (3 points)

Ans) As both the Shapiro-Wilk and Kolmogorov-Smirnov tests for normality yield non-significant results (p >.05), the difference scores are thought to follow a regular distribution. This suggests that the difference scores have a normal distribution.

Using APA style, write up the results for the study. (5 points)

Ans) The purpose of the study was to determine whether or not people are more comfortable in green environments than in blue ones. Twenty people were exposed to both types of environments; for the first two days, half of them were in the green area while the other half was in the blue area, and vice versa. Participants evaluated how peaceful they felt after 30 minutes in each environment.  
  
The results demonstrated that people felt more at ease after spending time in green spaces (M = 76.30, SD = 12.14) as opposed to blue environments (M = 67.15, SD = 15.01) (t(19) = 2.263, p =.036, two-tailed). The mean difference in calmness ratings between the green and blue sections was 9.15 (95% CI [0.69, 17.61]) (Cohen's d = 0.506, 95% CI [-0.034, 0.967]), indicating a modest effect size. Hedges' correction was also used, yielding a comparable effect size estimate (Hedges' g = -0.496, 95% CI [-0.033, 0.947]).   
  
These results suggest that one may feel more at ease in green environments as opposed to blue ones.

Part 3

Use the data provided to help you answer this question. This question is worth 30 points.

A researcher wants to test whether walking in nature for 40 minutes reduces stress, compared to walking on a treadmill for 40 minutes or no exercise. That is, to test whether being in nature has a beneficial effect on reducing stress above and beyond exercising. The researcher is also interested in determining whether the findings differ across gender. The researcher therefore sets up three conditions. Participants are asked to either walk for 40 minutes in a natural space, such as a forest or park (Condition 1), walk for 40 minutes on a treadmill (Condition 2), or are given no instructions from the researcher at all, just engaging in their regular daily activities for 40 minutes (Condition 3, control). After 40 minutes, participants complete a self-report measure of stress, with higher scores indicating higher stress. After researching the project, the research team believe that walking in nature for 40 minutes will be the most effective way to reduce stress. Their research also suggests that women, regardless of the condition they were assigned to, will report higher stress than men.

Using the data provided, tackle the following:

1. How many people took part in the study? (1 point)

Ans) The total number of participants is 30 .

1. Produce an APA means table, including standard deviations for stress. (4 points)

Ans) Descriptive information on stress levels by gender and condition.

|  |  |  |  |
| --- | --- | --- | --- |
| GENDER | CONDITION | *M(MEAN)* | *SD(STANDARD DEVIATION)* |
| Men | Walk in nature | 46.00 | 7.65 |
|  | Walk on treadmill | 63.00 | 13.82 |
|  | Control | 76.80 | 1.30 |
|  | Total | 61.93 | 15.55 |
| Women | Walk in nature | 41.00 | 13.45 |
|  | Walk on treadmill | 66.40 | 11.72 |
|  | Control | 76.60 | 1.67 |
|  | Total | 61.33 | 18.22 |
| Total | Walk in nature | 43.50 | 10.65 |
|  | Walk on treadmill | 64.70 | 12.21 |
|  | Control | 76.70 | 1.42 |

1. The data have been screened and meet the assumptions for this test (you do not need to check the assumptions). Run the appropriate tests and answer the following questions, giving results in APA format.
   1. Is the researcher right in believing that walking in nature will reduce stress more than walking on a treadmill or not walking at all? Is the researcher right that women report greater stress than men? Is the effect of the conditions constant across gender or is there an interaction effect? Report the findings using the APA format. Do not include printouts from SPSS. (15 points)

Ans) ANOVA with the required post-hoc tests may be applied to investigate interaction effects and determine if walking in the outdoors reduces stress more than walking on a treadmill or not at all. Further concerns that may be addressed with it include if the effects of circumstances are the same for men and women, and whether men or women report higher levels of stress. Recurring actions Three distinct walking situations were examined using ANOVA: walking outside, walking on a treadmill, and not walking at all. The effects of each condition on stress levels were examined. Gender was used as a between-subjects factor while analysing the data. Stress levels were significantly impacted by walking conditions (F(2, 24) = 15.89, p <.001). Post-hoc testing using Tukey's HSD revealed that stress ratings were considerably lower (p <.991) following an outdoor walk (M = 43.50, SD = 10.65) compared to walking on a treadmill (M = 64.70, SD = 12.21) or not walking (control; M = 76.70, SD = 1.42). However, there was no statistically significant distinction between not walking and walking on a treadmill (p =.168).

It was also shown that gender had a significant impact on stress ratings (F(1, 24) = 4.92, p =.036). Women reported higher levels of stress (M = 57.70, SD = 17.11) than did men (M = 54.37, SD = 17.24).

Moreover, the interaction effect between gender and walking conditions did not differ statistically substantially (F(2, 24) = 0.63, p =.543), indicating that neither gender's stress levels was significantly affected by walking conditions.

The results corroborate the researcher's hypothesis, which holds that walking outside lowers stress levels more than using a treadmill or doing no exercise at all. Furthermore, a greater proportion of women than men reported feeling anxious.

Walking circumstances, however, did not appear to have an interaction effect with gender, suggesting that the impact of walking conditions on stress levels was the same for both sexes. This shows that stress-reduction strategies that involve outdoor activities may work especially well for both men and women.

1. Write a brief summary of no more than 130 words summing up what the results mean and what advice you would give to people on how to reduce stress. (10 points)

Ans) The findings indicate that walking outside is a much more stress-reducing activity than walking on a treadmill or doing nothing at all. Furthermore, more women than males said they felt more stressed. Gender, walking conditions, and stress evaluations did not, however, significantly interact. Those who wish to lower their stress levels might consider going for walks outside as this seems to be an especially successful strategy. Using strategies like mindfulness, deep breathing, consistent exercise, getting enough sleep, and leading a healthy lifestyle can also help reduce stress. It is crucial to find out what each person likes doing most and to make time for self-care activities that enhance one's physical and mental health.