**Sign test practice**

**Sign test questions**

**Question one-** [](http://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0CAcQjRxqFQoTCMWenuTC2MYCFcYW2wodglML6Q&url=http://jcpenneypromocode.biz/haircut/breakfast-cereal-brands&ei=iuajVcWxIcat7AaCp63IDg&bvm=bv.97653015,d.ZGU&psig=AFQjCNGlwVVLjIOrZsS9ruunoG9ngeUXrw&ust=1436891018813129)

A food manufacturer wishes to find out if its new breakfast cereal ‘Fizz-Buzz’ will be as popular as its existing product ‘Kiddy-Slop’. 10 participants try both products and choose which they prefer. 1 participant prefers Kiddy-Slop, 7 prefer the new Fizz-Buzz, and 2 like both equally. yummy! There has been no previous research into these drinks.

|  |  |  |
| --- | --- | --- |
| Participant number | Preference | Direction of difference |
| 1 | Fizz-Buzz | + |
| 2 | Fizz-Buzz | + |
| 3 | No difference | Omitted |
| 4 | Kiddy-Slop | - |
| 5 | Fizz-Buzz | + |
| 6 | Fizz-Buzz | + |
| 7 | Fizz-Buzz | + |
| 8 | No difference | Omitted |
| 9 | Fizz-Buzz | + |
| 10 | Fizz-Buzz | + |

What is your value of S? What is your value of N? SO what is your critical value? Are the results significant? What hypothesis should accept and why? (5 marks)

**Include all of your calculations and working below**

**Question two-sign test practice question**

A researcher asked participants to rate how happy they felt before and after watching an uplifting film (1=very happy, 8=very sad). Her experimental hypothesis was;

Participants will be significantly happier giving themselves lower ratings after watching an uplifting film than before.

**Null**-There will be no difference in the happiness ratings of participants, before and after watching an uplifting film.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Participant** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| **Happiness level (1-8)** | **Before film** | 5 | 4 | 3 | 2 | 7 | 5 | 4 | 4 | 7 |
| **After film** | 6 | 7 | 1 | 8  Remember-It doesn’t matter which you subtract from the other as long as you always subtract in the same direction. | 8 | 7 | 6 | 4 | 6 |

****

**Show your workings for each question.**

1. What is the observed value (S)? (3 marks)

2. What is the critical value (3 marks?)

3. Are the results significant, for p≤0.05? (3 marks)

**Total 9 marks**

**Critical value tables**

**Question three-sign test practice**

A psychologist thinks there is a difference in the hours of sleep people have depending on the day of the week. She compares how many hours sleep 8 participants had on Friday night one week with how many hours of sleep they had on Sunday night during the same week. No previous research exists in this area.

****1. Should the hypothesis for this research be direction or non-directional? Justify your answer (2 marks)

2. Write a fully operationalised hypothesis for this research (2 marks)

3. She marks the difference between each participant’s set of scores as either positive or negative. What type of data does he have now? (1 mark)

4. The sign test is used to examine the data, why is this appropriate for this research? (3 marks)

5. Given that none of the participants had a difference of zero, what is the value of N for this data set? (1 mark)

**Question four-sign test practice**

A psychologist hypothesised that the time of day affect memory. She asked participants to learn and recall a list of ten words in the morning and again in the evening. Her results are shown in the table below.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Participants** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
| **Number of words recalled** | **Morning** | 2 | 3 | 8 | 6 | 7 | 9 | 10 | 3 | 9 | 8 | 9 | 10 |
| **Evening** | 6 | 3 | 5 | 4 | 6 | 9 | 10 | 2 | 7 | 10 | 10 | 6 |

**Remember to show all of your workings**

1. What is the value of S for this data? (3 marks)
2. What is the value of N for this data? (1 mark)
3. What is the critical value for this data at the 5% level? (2 marks)
4. Are the results significant, for p≤0.05? (3 marks)

**Total (9 marks)**

1. 7 +, 1 - so S=1

N=8

Critical value of S at 5%,non directional N=8 is 0

S≤ critical value to be significant but as 1 ≥0 then the results are not significant so we can’t say that the new cereal is more popular than the old one.

2. a)6-, 2+ So S=2

b)Directional hypothesis at 5% with N=8 CV=1

C) S≤CV to be significant but 2 is more than 1 so the results are not significant and so we can’t say that watching uplifting films makes you feel happier.

Question 3

a)Non-directional, no previous research

b)There will be a difference in the amount of hours sleep participants get on a Sunday night compared to a Friday night.

c)Nominal

d)Nominal data, test of difference, repeated measures

e) N=8

Question 4

1. 6-, 3+ so S=3
2. N=9
3. Non-directional so CV=1
4. No, S must be less than the critical value but 3 is bigger than 0 so the results are not significant and so time of day does not effect memory.