

NAME - ASHUTOSH ARDU

REG NO - 20BRS1262

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MATHS STATS LAB-7

OUTPUTS

QUESTION "1" AND ANSWER

```
Console Terminal x Jobs x
~/
> #Suppose the manufacturer claims that the mean lifetime of a light bulb is more
> #than 10,000 hours. In a sample of 30 light bulbs, it was found that they only
> #last 9,900 hours on average. Assume the population standard deviation is 120 hours.
> #At 0.05 significance level, can we reject the claim by the manufacturer?
>
> # So here myu=10000, n=30, mean=9900, sd=120
> xbar=9900
> myu=10000
> n=30
> sd=120
> z=(xbar-myu)/(sd/sqrt(n))
> abs(z)
[1] 4.564355
> alpha=0.05
> zalpha=qnorm(1-alpha)
> zalpha
[1] 1.644854
>
> if(abs(z)<abs(zalpha)){print("Hypothesis accepted")}else{print("Hypothesis rejected")}
[1] "Hypothesis rejected"
> |
```

QUESTION "2"

AND ANSWER

```
Console Terminal x Jobs x
~/
> #Suppose the mean weight of King Penguins found in an Antarctic
> #colony last year was 15.4 kg. In a sample of 35 penguins same
> #time this year in the same colony, the mean penguin weight is 14.6 kg.
> #Assume the population standard deviation is 2.5 kg. At .05 significance
> #level, can we reject the null hypothesis that the mean penguin weight
> # does not differ from last year?
> # xbar=14.6 myu=15.4 sd=2.5 n=35 alpha=0.05
> xbar=14.6
> myu=15.4
> sd=2.5
> n=35
> z=(xbar-myu)/(sd/sqrt(n))
> abs(z)
[1] 1.893146
> alpha=0.05
> zalp=qnorm(1-alpha/2)
> zalp
[1] 1.959964
> if(abs(z)<abs(zalp)){print("Hypothesis accepted")}else{print("Hypothesis rejected")}
[1] "Hypothesis accepted"
> |
```

QUESTION "3" AND ANSWER

```
Console Terminal x Jobs x
~/
> #The average mark scored by 32 boys is 72 with a S.D of 8,
> #while that for 36 girls is 70
> #with a S.D. of 6. Test at 1% level of
> #significance whether the boys perform better
> #than girls
>
> xbar1=72
> xbar2=70
> n1=32
> n2=36
> sd1=8
> sd2=6
> alpha=0.01
> z=(xbar1-xbar2)/sqrt((sd1)^2/n1+(sd2)^2/n2)
> z
[1] 1.154701
> zalp=qnorm(1-alpha)
> zalp
[1] 2.326348
> if(abs(z)<abs(zalp)){print("Hypothesis accepted")}else{print("Hypothesis rejected")}
[1] "Hypothesis accepted"
> |
```

QUESTION "4" AND ANSWER

```
Console Terminal x Jobs x
~/
> #Suppose the food label on a cookie bag states that there is
> #at most 2 grams of saturated fat in a single cookie. In a sample
> #of 35 cookies, it is found that the mean amount of saturated fat
> #per cookie is 2.1 grams. Assume that the population standard deviation
> #is 0.25 grams. At 0.05 significance level, can we reject the claim on food label?
> myu=2.1
> xbar=2
> n=35
> sd=0.25
> alpha=0.05
> z=(xbar-myu)/(sd/sqrt(n))
> abs(z)
[1] 2.366432
> zalpha=qnorm(1-alpha)
> zalpha
[1] 1.644854
> if(abs(z)<abs(zalpha)){print("Hypothesis accepted")}else{print("Hypothesis rejected")}
[1] "Hypothesis rejected"
> |
```

QUESTION "5" AND ANSWER

```
Console Terminal x Jobs x
~/
> #A Model Examination was conducted to XII Standard students in the subject of Statistics.
> #A District Educational Officer wanted to analyze the Gender-wise performance of the students
> #using the marks secured by randomly selected boys and girls. Sample measures were calculated
> #and the details are presented below:
> # Boys n=100 xbar=50 sd=4
> # Girls n=150 xbar=51 sd=5
> #Test, at 5% level of significance, whether performance of the students differ significantly
> #with respect to their gender.
> xbar1=50
> xbar2=51
> n1=100
> n2=150
> sd1=4
> sd2=5
> alpha=0.05
> z=(xbar1-xbar2)/sqrt((sd1)^2/n1+(sd2)^2/n2)
> abs(z)
[1] 1.749636
> zalpha=qnorm(1-(alpha/2))
> zalpha
[1] 1.959964
> if(abs(z)<abs(zalpha)){print("Hypothesis accepted")}else{print("Hypothesis rejected")}
[1] "Hypothesis accepted"
> |
```