**regression and Correlation**

We have the following table show age X and blood pressure Y of 8 women

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 42 | 36 | 63 | 55 | 42 | 60 | 49 | 68 | X |
| 125 | 118 | 140 | 150 | 140 | 155 | 145 | 152 | Y |

Find

correlation of x and y .1

 covariance.2

The equation of regression .3

**> cor(x,y)**

**[1] 0.7918318**

**> cor.test(x,y)**

 **Pearson's product-moment correlation**

**data: x and y**

**t = 3.1758, df = 6, p-value = 0.01918**

**alternative hypothesis: true correlation is not equal to 0**

**95 percent confidence interval:**

 **0.1971842 0.9605402**

**sample estimates:**

 **cor**

**0.7918318**

**> cov(x,y)**

**[1] 118.5179**

.3

**> fit<-lm(y~x)**

**> summary(fit)**

**Call:**

**lm(formula = y ~ x)**

**Residuals:**

 **Min 1Q Median 3Q Max**

**-10.713 -7.060 1.647 6.988 8.330**

**Coefficients:**

 **Estimate Std. Error t value Pr(>|t|)**

**(Intercept) 93.5838 15.1239 6.188 0.00082 \*\*\***

**x 0.9068 0.2855 3.176 0.01918 \***

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**Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1**

**Residual standard error: 8.637 on 6 degrees of freedom**

**Multiple R-squared: 0.627, Adjusted R-squared: 0.5648**

**F-statistic: 10.09 on 1 and 6 DF, p-value: 0.01918**

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Binomail distribution

Abaised coin is tossed 6 times , the probability of head = 0.3

Let X denote the number of head comes up

P(X=2)=

P(X<=3)=

**> dbinom(2,size=6,prob=0.3)**

**[1] 0.324135**

**> pbinom(3,size=6,prob=0.3)**

**[1] 0.92953**

**One T test**

For asampe of 10 fruits from thirteen-years-old acidles orange tree ,the fruit shape (determined by diameter /height) was measured as follows

1.07 1.08 1.07 1.05 1.06 1.02 1.04 1.05 1.04 0.976

Test whether the mean of fruit shape greater than 1.02

**Solution**

> x

 **[1] 1.070 1.080 1.070 1.050 1.060 1.020 1.040 1.050 1.040 0.976**

**> t.test(x,mu=1.02,alternative="greater")**

 **One Sample t-test**

**data: x**

**t = 2.6849, df = 9, p-value = 0.0125**

**alternative hypothesis: true mean is greater than 1.02**

**95 percent confidence interval:**

 **1.028121 Inf**

**sample estimates:**

**mean of x**

 **1.0456**

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**ionNormal distribut**

**. find Suppose X is Normal with mean 2 and standard deviation=0.25**

**> pnorm(2.5,2,0.25)**

**[1] 0.9772499**

**> qnorm(0.90)**

**[1] 1.281552**

**> qnorm(0.3,2,0.25)**

**[1] 1.8689**

**Question:**

**> r<-0.5**

**> f<-function(x) {r\*exp(-r\*x^2)}**

**> integrate(f,lower=0,upper=5)**

**0.6266567 with absolute error < 5.4e-10**

**> integrate(f,lower=0,upper=Inf)**

**0.6266571 with absolute error < 5.9e-05**

**Two sample T test**

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**> x<-c(94.95,95.15,94.85,94.55,93.4,95.05,94.35,94.70,94.90)**

**> y<-c(91.25,91.80,91.50,91.65,91.15,90.25,91.90,91.25,91.65,91)**

**> t. test (y ,x ,alternative="less")**

 **Welch Two Sample t-test**

**data: y and x**

**t = -14.162, df = 16.294, p-value = 6.999e-11**

**alternative hypothesis: true difference in means is less than 0**

**95 percent confidence interval:**

 **-Inf -2.907264**

**sample estimates:**

**mean of x mean of y**

 **91.34000 94.65556**

**One way Anova :**



**> x<-c(9,12,14,11,13,10,6,9,9,10,12,14,11,13,11,9,8,11,7,8)**

**> y<-c("1","1","1","1","1","2","2","2","2","2","3","3","3","3","3","4","4","4","4","4")**

**> model<-aov(x~y)**

**> summary(model)**

 **Df Sum Sq Mean Sq F value Pr(>F)**

**y 3 54.95 18.32 7.045 0.00311 \*\***

**Residuals 16 41.60 2.60**

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**Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1**