

Assignment MAT1021(LAB)

Correlation and Regression

1. Find the correlation coefficient of the following data:

X	23	27	28	28	29	30	31	33	35	36
Y	18	20	22	27	21	29	27	29	28	29

>#code

> X

[1] 23 27 28 28 29 30 31 33 35 36

>

y

[1] 18 20 22 27 21 29 27 29 28 29

> cor.test(x,y,method="pearson")

Pearson's product-moment correlation

data: x and y

t = 4.0164, df = 8, p-value 0.003861

alternative hypothesis: true correlation is not equal to e 95 percent

confidence interval:

0.3874142 0.9554034

sample estimates:

cor 0.8176052

The screenshot shows the RStudio interface. The console on the left displays the following output:

```
> x
[1] 23 27 28 28 29 30 31 33 35 36
> y
[1] 18 20 22 27 21 29 27 29 28 29
> cor.test(x,y,method = "pearson")

Pearson's product-moment correlation

data: x and y
t = 4.0164, df = 8, p-value = 0.003861
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.3874142 0.9554034
sample estimates:
      cor 
0.8176052 
> |
```

The file explorer on the right shows the following files:

Name	Size	Modified
..		
.Rhistory	0 B	Apr 11, 2021, 8:36 PM
project.Rproj	205 B	May 26, 2021, 10:08 AM

2. Find the rank correlation from the following data:

<i>Pie</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>
<i>Judge 1</i>	18	24	23	13	27	19	30	10	20
<i>Judge 2</i>	7	18	9	4	17	8	29	5	10

>#code

```
> j1[1] 18 24 23 13 27 19 30 10 20
```

```
> j2[1] 7 18 9 4 17 8 29 5 10
```

```
> cor.test(j1,j2,method="spearman")
```

Spearman's rank correlation

rhodata: j1 and j2S = 6, p-value = 0.0003527

alternative hypothesis: true rho is not equal to 0

sample estimates: rho

0.95

The screenshot shows the RStudio interface. The console on the left displays the following output:

```
> j1
[1] 18 24 23 13 27 19 30 10 20
> j2
[1] 7 18 9 4 17 8 29 5 10
> cor.test(j1,j2,method="spearman")

Spearman's rank correlation rho

data: j1 and j2
S = 6, p-value = 0.0003527
alternative hypothesis: true rho is not equal to 0
sample estimates:
rho
0.95
> |
```

The Environment pane on the right shows the Global Environment with two variables:

Variable	Class	Values
j1	num [1:9]	18 24 23 13 27 19 30 10 20
j2	num [1:9]	7 18 9 4 17 8 29 5 10

The Files pane shows the project structure with a folder named 'project' containing files like '.Rhistory' and 'project.Rproj'.

3. Obtain a linear relationship between weight (kg) and height (cm) of the data below:

Height	165	170	140	130	175	165	180	170	170
Weight	65	66	59	50	65	68	70	65	69

>#code

```
> x<-c(165,170,140,130,175,165,180,170,170)
```

```
> y<-c(65,66,59,50,65,68,70,65,69)
```

```
> model<-lm(x~y)
```

```
> summary.lm(model)
```

Call:

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

Residuals:

Min	1Q	Median	3Q	Max
-10.084	-4.920	2.269	2.597	10.015

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	3.5514	25.1179	0.141	0.89155
y	2.4836	0.3902	6.365	0.00038 *

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

Residual standard error: 6.813 on 7 degrees of freedom

Multiple R-squared: 0.8527, Adjusted R-squared: 0.8316

F-statistic: 40.52 on 1 and 7 DF, p-value: 0.0003797

```

> x<-c(165,170,140,130,175,165,180,170,170)
> y<-c(65,66,59,50,65,68,70,65,69)
> model<-lm(x~y)
> summary.lm(model)

```

Call:
lm(formula = x ~ y)

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```

> |

```

The screenshot shows the RStudio file explorer pane. At the top, there's a search bar with 'model' entered and a 'List of 12' result. Below this, there's a 'Values' section showing a list of numbers. The main pane shows a file explorer view for a project named 'project'. It lists two files: '.Rhistory' (0 B, Apr 11, 2021, 8:36 PM) and 'project.Rproj' (205 B, May 27, 2021, 7:50 PM). The interface includes tabs for 'Files', 'Plots', 'Packages', 'Help', and 'Viewer'. There are also buttons for 'New Folder', 'Upload', 'Delete', 'Rename', and 'More'.