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**NPTEL** (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » **Data Science for Engineers (course)**

 Announcements (announcements)    **About the Course** ([https://swayam.gov.in/nd1\\_noc20\\_cs28/preview](https://swayam.gov.in/nd1_noc20_cs28/preview))

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## Unit 8 - Week 6

### Course outline

How does an NPTEL online course work?

**Week 0**
**Week 1**
**Week 2**
**Week 3**
**Week 4**
**Week 5**
**Week 6**

- ☒ Module : Predictive Modelling (unit? unit=43&lesson=44)
- ☐ Linear Regression (unit? unit=43&lesson=45)
- ☐ Model Assessment (unit? unit=43&lesson=46)

## Assignment 6

The due date for submitting this assignment has passed. **Due on 2020-03-11, 23:59 IST.**  
As per our records you have not submitted this assignment.

1) The graph for the straight-line  $y=mx+b$  ( $m$  - slope,  $b$  - intercept) will have a upward slope when **1 point** the value of

- ☐  $m=0$
- ☐  $m>0$
- ☐  $m<0$
- ☐  $m\geq 0$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*m>0*

2) In the simple linear regression equation  $y = 25.9 + 42x$ , where the value 25.9 refers to **1 point**

- ☐ intercept
- ☐ slope
- ☐ error
- ☐ prediction

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*intercept*

Based on the information given below answer the questions **3 and 4**  
The total sales amount ( $y$ ) and price for each model of toaster( $x$ ) was recorded.

☐ Diagnostics to Improve Linear Model Fit (unit? unit=43&lesson=47)

☐ Simple Linear Regression Model Building (unit? unit=43&lesson=48)

☐ Simple Linear Regression Model Assessment (unit? unit=43&lesson=49)

☐ Simple Linear Regression Model Assessment ( Continued ) (unit? unit=43&lesson=50)

☐ Multiple Linear Regression (unit? unit=43&lesson=51)

☒ Dataset (unit? unit=43&lesson=52)

☐ FAQ (unit? unit=43&lesson=53)

☐ Quiz : Practice Assignment 6 (assessment? name=95)

☐ **Quiz : Assignment 6 (assessment? name=119)**

☒ Week 6 Feedback (unit? unit=43&lesson=123)

☐ Solution - Assignment 6 (unit? unit=43&lesson=128)

**Week 7**

**Week 8**

**Text Transcripts**

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Sales amount(US dollars)	Price of the product (US dollars)
7000	62
4000	48
6000	48
3000	40
7000	60
4500	50
5000	55

3) Given the following model equation  $y = 173.48x - 3781.98$ , the estimated sales amount for a 56-dollar toaster is **1 point**

- ☐ 5933  
☐ 7895  
☐ 2500  
☐ 4580

No, the answer is incorrect.

Score: 0

Accepted Answers:  
5933

4) Given the following model equation  $y = 173.48x - 3781.98$ , the residual error when the price of the product is 62 dollars is given by **1 point**

- ☐ 22.25  
☐ 26.22  
☐ 25.36  
☐ 39.56

No, the answer is incorrect.

Score: 0

Accepted Answers:  
26.22

5) The coefficient of determination formula is:-

**1 point**

- ☐  $(SST / SSE) - 1$   
☐  $1 - (SSE / SSR)$   
☐  $(SSR / SST) - 1$   
☐  $1 - (SSE / SST)$

No, the answer is incorrect.

Score: 0

Accepted Answers:  
 $1 - (SSE / SST)$

6) Which of the following method is **NOT** appropriate to check the association between two continuous variables?

**1 point**

- ☐ Pearson's correlation  
☐ Chi-square test  
☐ Regression  
☐ T-test

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*Chi-square test*

7) If the value of SSE is equal to zero, then

1 point

- ☐ correlation is equal to 0
- ☐ correlation is less than 0
- ☐ coefficient of determination( $R^2$ ) must be equal to 1
- ☐ coefficient of determination( $R^2$ ) is equal to 0

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*coefficient of determination( $R^2$ ) must be equal to 1*

8) Which of the following is/ are **TRUE** with respect to Pearson's correlation( $r_{xy}$ )?

1 point

- ☐  $r_{xy}$  takes a value between 0 to +1
- ☐ A measure for the degree of linear dependence between two numerical variables
- ☐ Cannot be applied to ordinal variables
- ☐  $r_{xy} = 0$  means there is no correlation between x and y

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*A measure for the degree of linear dependence between two numerical variables*  
*Cannot be applied to ordinal variables*  
 *$r_{xy} = 0$  means there is no correlation between x and y*

Based on the information given below answer the questions from **9 to 12**

Read the given dataset **Auto.csv** (<https://drive.google.com/open?id=1HDojjo4uJRj6YP054xVmmcbb-TGocaWk>) in R studio.

The data is about vehicle performance. The objective is to predict the miles per gallon given the weight of the car .

Variable	Description
mpg	Miles per gallon of the engine
weight	Weight of the car (lbs)

9) Correlation between mpg and weight is (round off to two decimal places)

1 point

- ☐ 0.71
- ☐ -0.88
- ☐ 0.69
- ☐ 0.92

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*-0.88*

10) The linear model for the given data is

**1 point**

- ☐  $y = 0.0407 + 7.032x$
- ☐  $y = -0.00629 + 40x$
- ☐  $y = 0.020 + 0.45784x$
- ☐  $y = 40.56198 - 0.00629x$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$y = 40.56198 - 0.00629x$

11) The second quartile residual value for the linear model built on the Auto.csv data is

**1 point**

- ☐ -1.91568
- ☐ -7.2145
- ☐ -0.08124
- ☐ 1.73406

No, the answer is incorrect.

Score: 0

Accepted Answers:

-0.08124

12) From the regression model, the proportion of the variability explained in dependent variable by the independent variable is **1 point**

- ☐ 77%
- ☐ 12%
- ☐ 88%
- ☐ 42%

No, the answer is incorrect.

Score: 0

Accepted Answers:

77%

