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manojmanu609bv@gmail.com ✓

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


Course outline

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Week 1 ()

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Week 6 : Assignment 6

The due date for submitting this assignment has passed.

Due on 2024-09-04, 23:59 IST.

Assignment submitted on 2024-09-04, 23:06 IST

For the following set of questions 1, 2, 3, 4, 5 use the dataset [bonds.txt](https://drive.google.com/file/d/1EiulWRYEM7f1iG4m1EisiVJtcAxxUwzp/view?usp=sharing) (<https://drive.google.com/file/d/1EiulWRYEM7f1iG4m1EisiVJtcAxxUwzp/view?usp=sharing>). This dataset contains 2 variables, Coupon rate and Bid price.

 1) What is the relationship between the variables, Coupon rate and Bid price? **1 point**

- ☐ Coupon rate = $99.95 + 0.24 * \text{Bid price}$
☐ Bid price = $99.95 + 0.24 * \text{Coupon rate}$
☒ Bid price = $74.7865 + 3.066 * \text{Coupon rate}$
☐ Coupon rate = $74.7865 + 3.066 * \text{Bid price}$

Yes, the answer is correct.

Score: 1

Accepted Answers:

 $\text{Bid price} = 74.7865 + 3.066 * \text{Coupon rate}$

 2) Choose the correct option that best describes the relation between the variables Coupon rate and Bid price in the given data. **1 point**

- ☒ Strong positive correlation
☐ Weak positive correlation
☐ Strong negative correlation
☐ Weak negative correlation

Yes, the answer is correct.

Score: 1

Accepted Answers:

 $\text{Strong positive correlation}$

☐ Module :
Predictive
Modelling
(unit?
unit=72&lesso
n=73)

☐ Linear
Regression
(unit?
unit=72&lesso
n=74)

☐ Model
Assessment
(unit?
unit=72&lesso
n=75)

☐ Diagnostics to
Improve Linear
Model Fit
(unit?
unit=72&lesso
n=76)

☐ Simple Linear
Regression
Model Building
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unit=72&lesso
n=77)

☐ Simple Linear
Regression
Model
Assessment
(unit?
unit=72&lesso
n=78)

☐ Simple Linear
Regression
Model
Assessment (Continued)
(unit?
unit=72&lesso
n=79)

☐ Multiple Linear
Regression
(unit?
unit=72&lesso
n=80)

☐ Dataset (unit?
unit=72&lesso
n=81)

3) What is the R-Squared value of the model obtained in Q1?

1 point

- ☐ 0.2413
☐ 0.12
☒ 0.7516
☐ 0.5

Yes, the answer is correct.

Score: 1

Accepted Answers:

0.7516

4) What is the adjusted R-Squared value of the model obtained in Q1?

1 point

- ☐ 0.22
☒ 0.7441
☐ 0.088
☐ 0.5

Yes, the answer is correct.

Score: 1

Accepted Answers:

0.7441

5) Based on the model relationship obtained from Q1, what is the residual error obtained while calculating the bid price of a bond with coupon rate of 3?

1 point

- ☐ 10.5155
☐ -10.5155
☐ 6.17
☒ 0

No, the answer is incorrect.

Score: 0

Accepted Answers:

10.5155

6) State whether the following statement is True or False.

1 point

Covariance is a better metric to analyze the association between two numerical variables than correlation.

- ☐ True
☒ False

Yes, the answer is correct.

Score: 1

Accepted Answers:

False

7) If R^2 is 0.6, SSR=200 and SST=500, then SSE is

1 point

- ☐ 500
☐ 200

☐ FAQ (unit? unit=72&lesson=82)

☐ Practice: Week 6: Assignment 6 (Non Graded) (assessment? name=211)

☒ Quiz: Week 6 : Assignment 6 (assessment? name=222)

☐ Week 6 Feedback Form : Data Science for Engineers (unit? unit=72&lesson=158)

Week 7 ()

Week 8 ()

Text Transcripts ()

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Problem Solving Session - July 2024 ()

- ☒ 300
- ☐ None of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:
300

8) Linear Regression is an optimization problem where we attempt to minimize

1 point

- ☐ SSR (residual sum-of-squares)
- ☐ SST (total sum-of-squares)
- ☒ SSE (sum-squared error)
- ☐ Slope

Yes, the answer is correct.

Score: 1

Accepted Answers:
SSE (sum-squared error)

9) The model built from the data given below is $Y = 0.2x + 60$. Find the values for R^2 and Adjusted R^2 . 1 point

X	80	75	85	70	65
Y	85	70	80	95	70

Table 1.2.Q

- ☐ R^2 is 0.022 and Adjusted R^2 is -0.303
- ☐ R^2 is 0.022 and Adjusted R^2 is -0.0303
- ☐ R^2 is 0.022 and Adjusted R^2 is 0.303
- ☒ None of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:
None of the above

10) Identify the parameters β_0 and β_1 that fits the linear model $\beta_0 + \beta_1 x$ using the following information: total sum of squares of X , $SS_{XX} = 52.53$, $SS_{XY} = 52.01$, mean of X , $\bar{X}=4.46$, and mean of Y , $\hat{Y}=6.32$. 1 point

- ☒ 1.9 and 0.99
- ☐ 10.74 and 1.01
- ☐ 4.42 and 1.01
- ☐ None of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:
1.9 and 0.99

