Feature Engineering MCQs

1. **What is Feature Engineering?**
    - A. The process of storing data
    - B. The process of using domain knowledge to extract features from raw data
    - C. The process of cleaning data
    - D. The process of collecting data
    - **Answer: B. The process of using domain knowledge to extract features from raw data**
2. **Which of the following is an example of feature transformation?**
    - A. Encoding categorical variables
    - B. Creating interaction features
    - C. All of the above
    - D. Scaling
    - **Answer: C. All of the above**
3. **What is one-hot encoding?**
    - A. Encoding categorical variables as continuous vectors
    - B. Encoding continuous variables as binary vectors
    - C. Encoding continuous variables as continuous vectors
    - D. Encoding categorical variables as binary vectors
    - **Answer: D. Encoding categorical variables as binary vectors**
4. **Which method is used to handle missing values in a dataset?**
    - A. Encoding
    - B. Scaling
    - C. Normalization
    - D. Imputation
    - **Answer: D. Imputation**
5. **What is feature scaling?**
    - A. The process of creating new features
    - B. The process of normalizing the range of features
    - C. The process of encoding features
    - D. The process of imputing missing values

- **Answer: B. The process of normalizing the range of features**

6. **Which of the following is a common method for feature scaling?**
   - A. Normalization
   - B. Both A and B
   - C. Neither A nor B
   - D. Standardization
   - **Answer: B. Both A and B**
7. **What is feature selection?**
   - A. The process of scaling features
   - B. The process of selecting the most relevant features for model building
   - C. The process of creating new features
   - D. The process of encoding features
   - **Answer: B. The process of selecting the most relevant features for model building**
8. **What is the purpose of feature extraction?**
   - A. To encode the data
   - B. To reduce the dimensionality of the data
   - C. To scale the data
   - D. To impute missing values
   - **Answer: B. To reduce the dimensionality of the data**
9. **Which of the following techniques is used for feature extraction?**
   - A. Principal Component Analysis (PCA)
   - B. Linear Regression
   - C. K-Means Clustering
   - D. Decision Trees
   - **Answer: A. Principal Component Analysis (PCA)**
10. **What is the purpose of binning in feature engineering?**
    - A. To scale data
    - B. To encode categorical data
    - C. To handle missing values
    - D. To group continuous data into discrete intervals
    - **Answer: D. To group continuous data into discrete intervals**

11. **What is the benefit of log transformation in feature engineering?**
    - A. It can reduce the dimensionality of the data
    - B. It can handle missing values
    - C. It can encode categorical data
    - D. It can help normalize skewed data
    - **Answer: D. It can help normalize skewed data**
12. **What is the purpose of polynomial features?**
    - A. To create interaction terms between features
    - B. To scale features
    - C. To impute missing values
    - D. To encode categorical data
    - **Answer: A. To create interaction terms between features**
13. **What is a dummy variable?**
    - A. A variable used to encode features
    - B. A variable used to impute missing values
    - C. A binary variable created to represent categorical data
    - D. A variable used to scale data
    - **Answer: C. A binary variable created to represent categorical data**
14. **What is an outlier?**
    - A. A data point that is encoded
    - B. A data point that is significantly different from other data points
    - C. A data point that is scaled
    - D. A data point that is missing
    - **Answer: B. A data point that is significantly different from other data points**
15. **Which of the following methods can be used to detect outliers?**
    - A. Both A and B
    - B. Z-Score
    - C. Neither A nor B
    - D. IQR (Interquartile Range)
    - **Answer: A. Both A and B**

16. **What is the purpose of feature normalization?**

- A. To create new features
- B. To encode categorical features
- C. To impute missing values
- D. To scale features to a standard range
- **Answer: D. To scale features to a standard range**

17. **Which method is used to create interaction features?**
    - A. SimpleImputer()
    - B. PolynomialFeatures()
    - C. StandardScaler()
    - D. LabelEncoder()
    - **Answer: B. PolynomialFeatures()**
18. **What is feature importance?**
    - A. A method to handle missing values
    - B. A method to encode features
    - C. A measure of how useful a feature is in predicting the target variable
    - D. A method to scale features
    - **Answer: C. A measure of how useful a feature is in predicting the target variable**
19. **Which technique can be used to reduce the number of features?**
    - A. Feature selection
    - B. Feature scaling
    - C. Feature encoding
    - D. Feature imputation
    - **Answer: A. Feature selection**
20. **What is the purpose of using interaction terms in feature engineering?**
    - A. To encode categorical features
    - B. To scale features
    - C. To impute missing values
    - D. To capture the effect of multiple features acting together
    - **Answer: D. To capture the effect of multiple features acting together**
21. **Which of the following is an unsupervised method for feature extraction?**
    - A. Decision Trees

- B. Principal Component Analysis (PCA)
- C. Linear Regression
- D. Logistic Regression
- **Answer: B. Principal Component Analysis (PCA)**

22. **What is feature engineering?**
    - A. The process of collecting data
    - B. The process of transforming raw data into features suitable for modeling
    - C. The process of storing data
    - D. The process of cleaning data
    - **Answer: B. The process of transforming raw data into features suitable for modeling**
23. **Which method is used to handle categorical data?**
    - A. Imputation
    - B. Scaling
    - C. Normalization
    - D. One-hot encoding
    - **Answer: D. One-hot encoding**
24. **What is the purpose of feature scaling?**
    - A. To encode categorical features
    - B. To impute missing values
    - C. To create new features
    - D. To bring all features to the same scale
    - **Answer: D. To bring all features to the same scale**
25. **Which of the following is a common method for feature selection?**
    - A. K-Means Clustering
    - B. Support Vector Machine (SVM)
    - C. Recursive Feature Elimination (RFE)
    - D. Gradient Descent
    - **Answer: C. Recursive Feature Elimination (RFE)**

Math MCQs

1. **What is the value of π (pi)?**

- A. 2.71
- B. 1.41
- C. 1.61
- D. 3.14
- **Answer: D. 3.14**

2. **What is the square root of 144?**
   - A. 10
   - B. 11
   - C. 13
   - D. 12
   - **Answer: D. 12**
3. **What is the derivative of x^2?**
   - A. x
   - B. 2x
   - C. x^2
   - D. 1/x
   - **Answer: B. 2x**
4. **What is the integral of 1/x dx?**
   - A. 1/x + C
   - B. x + C
   - C. ln(x) + C
   - D. e^x + C
   - **Answer: C. ln(x) + C**
5. **What is the value of e (Euler's number)?**
   - A. 3.14
   - B. 1.41
   - C. 2.71
   - D. 1.61
   - **Answer: C. 2.71**
6. **What is the formula for the area of a circle?**
   - A. $2\pi r$

- B. πd
- C. $r^2/2$
- D. πr^2
- **Answer: D. πr^2**

7. **What is the value of the square root of 49?**
   - A. 5
   - B. 6
   - C. 7
   - D. 8
   - **Answer: C. 7**
8. **What is the derivative of sin(x)?**
   - A. cos(x)
   - B. -cos(x)
   - C. -sin(x)
   - D. 1/sin(x)
   - **Answer: A. cos(x)**
9. **What is the integral of cos(x) dx?**
   - A. sin(x) + C
   - B. -sin(x) + C
   - C. -cos(x) + C
   - D. 1/cos(x) + C
   - **Answer: A. sin(x) + C**
10. **What is the value of $(2+3i)^2$?**
    - A. -5 + 12i
    - B. 5 + 12i
    - C. -5 - 12i
    - D. 5 - 12i
    - **Answer: A. -5 + 12i**
11. **What is the sum of the angles in a triangle?**
    - A. 90°
    - B. 180°

- C. 270°
- D. 360°
- **Answer: B. 180°**

12. **What is the solution to the equation $x^2 - 4 = 0$?**
    - A. $x = \pm 2$
    - B. $x = \pm 4$
    - C. $x = 2$
    - D. $x = -2$
    - **Answer: A. $x = \pm 2$**
13. **What is the cosine of 0 degrees?**
    - A. 1
    - B. 0
    - C. -1
    - D. 1/2
    - **Answer: A. 1**
14. **What is the value of log(1)?**
    - A. 1
    - B. 0
    - C. 10
    - D. 2
    - **Answer: B. 0**
15. **What is the value of tan(45 degrees)?**
    - A. 0
    - B. 1
    - C. √3
    - D. 1/√3
    - **Answer: B. 1**
16. **What is the equation of a line with slope 2 and y-intercept 3?**
    - A. $y = 2x + 3$
    - B. $y = 3x + 2$
    - C. $y = 2x - 3$

- D. y = 3x - 2
- **Answer: A. y = 2x + 3**

17. **What is the value of sin(90 degrees)?**
    - A. 0
    - B. 1
    - C. -1
    - D. 1/2
    - **Answer: B. 1**
18. **What is the solution to the equation 2x + 3 = 7?**
    - A. x = 1
    - B. x = 2
    - C. x = 3
    - D. x = 4
    - **Answer: B. x = 2**
19. **What is the value of the determinant of the matrix [[1, 2], [3, 4]]?**
    - A. -2
    - B. -1
    - C. 1
    - D. 2
    - **Answer: A. -2**
20. **What is the value of 2^3?**
    - A. 4
    - B. 6
    - C. 8
    - D. 10
    - **Answer: C. 8**
21. **What is the sum of the first 10 positive integers?**
    - A. 45
    - B. 50
    - C. 55
    - D. 60

- **Answer: C. 55**

22. **What is the value of 0! (zero factorial)?**
    - A. 0
    - B. 1
    - C. Undefined
    - D. Infinity
    - **Answer: B. 1**
23. **What is the formula for the circumference of a circle?**
    - A. πr^2
    - B. $2\pi r$
    - C. πd
    - D. $r^2/2$
    - **Answer: B. $2\pi r$**
24. **What is the value of the absolute value of -5?**
    - A. -5
    - B. 0
    - C. 5
    - D. 10
    - **Answer: C. 5**
25. **What is the value of the expression 3 + 4 * 2?**
    - A. 14
    - B. 11
    - C. 10
    - D. 9
    - **Answer: B. 11**
26. **What is the solution to the equation $x^2 - 1 = 0$?**
    - A. $x = \pm 2$
    - B. $x = \pm 1$
    - C. $x = 1$
    - D. $x = -1$
    - **Answer: B. $x = \pm 1$**

27. **What is the value of cos(180 degrees)?**
    - A. 0
    - B. 1
    - C. -1
    - D. 1/2
    - **Answer: C. -1**
28. **What is the value of log(10)?**
    - A. 1
    - B. 0
    - C. 10
    - D. 2
    - **Answer: A. 1**
29. **What is the value of tan(0 degrees)?**
    - A. 0
    - B. 1
    - C. √3
    - D. 1/√3
    - **Answer: A. 0**
30. **What is the equation of a line with slope -1 and y-intercept 4?**
    - A. y = -1x + 4
    - B. y = 4x - 1
    - C. y = -x + 4
    - D. y = 4x + 1
    - **Answer: C. y = -x + 4**
31. **What is the value of sin(0 degrees)?**
    - A. 0
    - B. 1
    - C. -1
    - D. 1/2
    - **Answer: A. 0**
32. **What is the solution to the equation 5x - 3 = 12?**

- A. x = 1
- B. x = 2
- C. x = 3
- D. x = 4
- **Answer: C. x = 3**

33. **What is the value of the determinant of the matrix [[2, 3], [1, 4]]?**
    - A. -2
    - B. -1
    - C. 1
    - D. 5
    - **Answer: D. 5**
34. **What is the value of 4^3?**
    - A. 8
    - B. 16
    - C. 64
    - D. 81
    - **Answer: C. 64**
35. **What is the sum of the first 5 positive integers?**
    - A. 10
    - B. 12
    - C. 15
    - D. 20
    - **Answer: C. 15**
36. **What is the value of 5! (five factorial)?**
    - A. 60
    - B. 120
    - C. 150
    - D. 200
    - **Answer: B. 120**
37. **What is the formula for the area of a rectangle?**
    - A. l + w

- B. $2(l + w)$
- C. lw
- D. $l^2 + w^2$
- **Answer: C. lw**

38. **What is the value of the absolute value of -10?**
    - A. -10
    - B. 0
    - C. 10
    - D. 20
    - **Answer: C. 10**
39. **What is the value of the expression 5 + 3 * 4?**
    - A. 12
    - B. 17
    - C. 14
    - D. 20
    - **Answer: B. 17**
40. **What is the solution to the equation $x^2 + 4x + 4 = 0$?**
    - A. $x = \pm 2$
    - B. $x = \pm 1$
    - C. $x = -2$
    - D. $x = 2$
    - **Answer: C. $x = -2$**
41. **What is the value of cos(90 degrees)?**
    - A. 0
    - B. 1
    - C. -1
    - D. 1/2
    - **Answer: A. 0**
42. **What is the value of log(100)?**
    - A. 1
    - B. 0

- C. 10
- D. 2
- **Answer: D. 2**

43. **What is the value of tan(90 degrees)?**
    - A. 0
    - B. 1
    - C. Undefined
    - D. 1/√3
    - **Answer: C. Undefined**
44. **What is the equation of a line with slope 3 and y-intercept -2?**
    - A. y = 3x - 2
    - B. y = -2x + 3
    - C. y = 3x + 2
    - D. y = -3x + 2
    - **Answer: A. y = 3x - 2**
45. **What is the value of sin(30 degrees)?**
    - A. 0
    - B. 1
    - C. 1/2
    - D. √3/2
    - **Answer: C. 1/2**
46. **What is the solution to the equation 3x + 5 = 11?**
    - A. x = 1
    - B. x = 2
    - C. x = 3
    - D. x = 4
    - **Answer: B. x = 2**
47. **What is the value of the determinant of the matrix [[3, 4], [2, 5]]?**
    - A. -2
    - B. -1
    - C. 1

- D. 7
- **Answer: D. 7**

48. **What is the value of 3^4?**
    - A. 27
    - B. 81
    - C. 243
    - D. 16
    - **Answer: B. 81**
49. **What is the sum of the first 20 positive integers?**
    - A. 190
    - B. 200
    - C. 210
    - D. 220
    - **Answer: C. 210**
50. **What is the value of 7! (seven factorial)?**
    - A. 420
    - B. 5040
    - C. 2520
    - D. 1440
    - **Answer: B. 5040**
51. **What is the formula for the area of a triangle?**
    - A. 1/2(base * height)
    - B. base * height
    - C. (base + height)/2
    - D. base + height
    - **Answer: A. 1/2(base * height)**
52. **What is the value of the absolute value of -15?**
    - A. -15
    - B. 0
    - C. 15
    - D. 30

- **Answer: C. 15**