

Day-9 Quiz-DataScience-Training

Welcome to the Python Programming Quiz! This quiz tests your knowledge of daily learnings. Please read the instructions carefully before starting the quiz.

Instructions and Rules

- **Time Limit:** You have 20 minutes to complete the quiz.
- **Number of Questions:** The quiz consists of 20 multiple-choice questions.
- **Scoring:** Each correct answer is worth 1 point. There is no negative marking for incorrect answers.
- **Single Attempt:** You are allowed only one attempt to complete the quiz.
- **Required Fields:** All questions are mandatory. You must answer each question to submit the quiz.
- **Resources:** This is a closed-book quiz. Do not use any external resources, including books, notes, or the internet.
- **Honesty:** Please answer the questions honestly and to the best of your ability. Cheating or dishonesty will result in disqualification.
- **Environment:** Ensure you are in a quiet environment where you can concentrate without interruptions.
- **Technical Issues:** In case of technical issues, please contact the quiz administrator immediately.
- **Retakes:** There are no retake opportunities for this quiz. Ensure you are prepared before starting.

Good luck, and do your best!

* Indicates required question

1. Email *

2. **1. What is the main difference between Gradient Descent and Stochastic Gradient Descent (SGD)? ***

Mark only one oval.

- ☐ a) Gradient Descent uses a subset of data
- ☐ b) SGD uses the entire dataset
- ☐ c) SGD uses one data point at a time
- ☐ d) There is no difference

3. **2. Why is Stochastic Gradient Descent often faster than Batch Gradient Descent? ***

Mark only one oval.

- ☐ a) It uses more data
- ☐ b) It requires less computational power
- ☐ c) It updates parameters more frequently
- ☐ d) It skips data points

4. **3. What is a potential downside of using Stochastic Gradient Descent? ***

Mark only one oval.

- ☐ a) It can overfit the data
- ☐ b) It converges slowly
- ☐ c) It may produce noisy updates
- ☐ d) It requires more memory

5. **4. Which of the following is true about the convergence of Stochastic Gradient Descent? ***

Mark only one oval.

- ☐ a) It always converges to the global minimum
- ☐ b) It may converge to a local minimum
- ☐ c) It converges faster than Batch Gradient Descent
- ☐ d) It does not require a learning rate

6. **5. In which scenario is Stochastic Gradient Descent particularly useful? ***

Mark only one oval.

- ☐ a) When the dataset is small
- ☐ b) When the model is simple
- ☐ c) When the dataset is large
- ☐ d) When the learning rate is high

7. **6. Which step is crucial before applying Stochastic Gradient Descent? ***

Mark only one oval.

- ☐ a) Normalizing the data
- ☐ b) Initializing parameters to zero
- ☐ c) Using a high learning rate
- ☐ d) Using the entire dataset

8. **7. How should the learning rate be adjusted during the training process? ***

Mark only one oval.

- ☐ a) It should be increased
- ☐ b) It should be decreased
- ☐ c) It should remain constant
- ☐ d) It should be set to zero

9. **8. Which technique can be used to prevent overfitting in Stochastic Gradient Descent? ***

Mark only one oval.

- ☐ a) Increasing the learning rate
- ☐ b) Using a smaller dataset
- ☐ c) Applying regularization
- ☐ d) Using a single data point

10. **9. During the update step in SGD, what is the role of the learning rate? ***

Mark only one oval.

- ☐ a) It determines the magnitude of the update
- ☐ b) It determines the direction of the gradient
- ☐ c) It adjusts the dataset size
- ☐ d) It initializes the parameters

11. **10. What should be done if the cost function oscillates during SGD? ***

Mark only one oval.

- ☐ a) Increase the learning rate
- ☐ b) Decrease the learning rate
- ☐ c) Use more data points
- ☐ d) Shuffle the dataset

12. **11. What type of machine learning task is vehicle performance prediction? ***

Mark only one oval.

- ☐ a) Classification
- ☐ b) Regression
- ☐ c) Clustering
- ☐ d) Dimensionality reduction

13. **12. Why is it important to split the dataset into training and test sets in vehicle performance prediction? ***

Mark only one oval.

- ☐ a) To reduce computation time
- ☐ b) To evaluate the model's performance on unseen data
- ☐ c) To increase the dataset size
- ☐ d) To ensure model convergence

14. **13. What is the primary goal of using Stochastic Gradient Descent in vehicle performance prediction? ***

Mark only one oval.

- ☐ a) To reduce the dataset size
- ☐ b) To find the optimal model parameters
- ☐ c) To increase the learning rate
- ☐ d) To initialize the model

15. **14. How can the learning rate affect the convergence of SGD? ***

Mark only one oval.

- ☐ a) A high learning rate always ensures faster convergence
- ☐ b) A low learning rate always prevents divergence
- ☐ c) An appropriate learning rate ensures steady convergence
- ☐ d) Learning rate does not affect convergence

16. **15. What is the typical range of values for the learning rate in Stochastic Gradient Descent? ***

Mark only one oval.

- ☐ a) Between 0 and 0.1
- ☐ b) Between 1 and 10
- ☐ c) Between 0.1 and 1
- ☐ d) Between 0.01 and 0.1

17. **16. In SGD, what is a 'mini-batch'? ***

Mark only one oval.

- ☐ a) A small portion of the dataset used in each iteration
- ☐ b) The entire dataset used in each iteration
- ☐ c) One single data point used in each iteration
- ☐ d) A batch that includes the entire training data

18. **17. How does the learning rate scheduler affect the training process in SGD? ***

Mark only one oval.

- ☐ a) It increases the learning rate over time
- ☐ b) It decreases the learning rate over time
- ☐ c) It keeps the learning rate constant
- ☐ d) It resets the learning rate to zero

19. **18. Why is it important to normalize the features before applying SGD? ***

Mark only one oval.

- ☐ a) To increase the batch size
- ☐ b) To reduce the learning rate
- ☐ c) To ensure that all features contribute equally to the gradient
- ☐ d) To decrease the training time

20. **19. Which of the following is a common technique for initializing model parameters in SGD? ***

Mark only one oval.

- ☐ a) Initializing all parameters to zero
- ☐ b) Initializing parameters with random small values
- ☐ c) Initializing parameters with large values
- ☐ d) Initializing parameters with the mean of the dataset

21. **20. What is the effect of using a very high learning rate in SGD? ***

Mark only one oval.

- ☐ a) Faster convergence
- ☐ b) Overshooting the minimum
- ☐ c) Reduced computation time
- ☐ d) Increased batch size

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