Mock Test 1 - Data Science - PPT - PW Skills

khushi.btech1@gmail.com Switch account

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Coding Question

Create a GitHub file for the solutions and then add the link in answer section

17. Write a function that takes a list of numbers as input and returns a new   10 points
list containing only the even numbers from the input list. Use list
comprehension to solve this problem.

Example:

Input: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]

Output: [2, 4, 6, 8, 10]

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18. Implement a decorator function called 'timer' that measures the   10 points
execution time of a function. The 'timer' decorator should print the time
taken by the decorated function to execute. Use the 'time' module in Python
to calculate the execution time.

Example:

import time

@timer
def my_function():
    # Function code goes here
    time.sleep(2)

my_function()

Output:
"Execution time: 2.00123 seconds"

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19. Write a function called 'calculate_mean' that takes a list of numbers as   10 points
input and returns the mean (average) of the numbers. The function should
calculate the mean using the sum of the numbers divided by the total
count.

Example:

```
def calculate_mean(numbers):
    total = sum(numbers)
    count = len(numbers)
    mean = total / count
    return mean

data = [10, 15, 20, 25, 30]
mean_value = calculate_mean(data)
print("Mean:", mean_value)
```

Output:
Mean: 20.0

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20. Write a function called 'perform_hypothesis_test' that takes two lists of   8 points
numbers as input, representing two samples. The function should perform a
two-sample t-test and return the p-value. Use the 'scipy.stats' module in
Python to calculate the t-test and p-value.

Example:

from scipy import stats

```
def perform_hypothesis_test(sample1, sample2):
    t_statistic, p_value = stats.ttest_ind(sample1, sample2)
    return p_value

sample1 = [5, 10, 15, 20, 25]
sample2 = [10, 20, 30, 40, 50]
p_value = perform_hypothesis_test(sample1, sample2)
print("P-value:", p_value)
```

Output:
P-value: 0.1064706396450037

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