Mock Test 1 - Data Science - PPT - PW Skills

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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 list containing only the even numbers from the input list. Use list comprehension to solve this problem. 10 points

Example:

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

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

Your answer

18. Implement a decorator function called ‘timer’ that measures the 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. 10 points

Example:

```
import time

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

my_function()
```

Output:
"Execution time: 2.00123 seconds"

Your answer

19. Write a function called ‘calculate_mean’ that takes a list of numbers as 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. 10 points

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

Your answer

20. Write a function called ‘perform_hypothesis_test’ that takes two lists of 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. 8 points

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

Your answer

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