List Practice Problems

1. Problem Statement : Python List Practice: Consecutive Differences & Filtering

You are given a list of integers representing daily temperatures:

```
temps = [30, 32, 35, 28, 26, 27, 29, 31, 33, 30]
```

Write a Python program to perform the following tasks:

1. **Calculate Consecutive Differences** Create a new list that contains the **absolute difference** between each consecutive day's temperature.
    - Example: if the list is `[30, 32, 35]`, the new list should be `[2, 3]`.
2. **Filter Differences** From the differences list, **keep only the differences that are greater than 3**.

    > **Constraint:** Do not use `in` or `not in` operators.

3. **Analyze Temperature Changes**
    - Count how many days had a **temperature increase** (difference > 0).
    - Count how many days had a **temperature decrease** (difference < 0).
4. **Print the Results** Your program should print:
    - The original temperature list
    - The consecutive differences list
    - The filtered differences list
    - The number of days with increase and decrease

Sample Input

```
temps = [30, 32, 35, 28, 26, 27, 29, 31, 33, 30]
```

Sample Output

```
Original temperatures: [30, 32, 35, 28, 26, 27, 29, 31, 33, 30]
Consecutive differences: [2, 3, -7, -2, 1, 2, 2, 2, -3]
Differences greater than 3: [-7]
Number of days with increase: 6
Number of days with decrease: 3
```

2 . Problem Statement : Python List Practice: Average Score Filter

You are given a list of integers representing students' scores in an exam:

```
scores = [78, 85, 92, 66, 70, 88, 95, 81, 60, 73]
```

Write a Python program to perform the following tasks:

1. **Calculate Average Score** Compute the average score of the class.
2. **Filter Above Average Scores** Create a new list containing only the scores that are **above the average**.
3. **Find Maximum and Minimum Scores** Determine the highest and lowest score in the list.
4. **Count Scores Below Average** Count how many students scored below the average.
5. **Print the Results** Your program should print:
    - The original scores list
    - The average score
    - The filtered list of above average scores
    - The highest and lowest score
    - The number of students who scored below average

Sample Input

```
scores = [78, 85, 92, 66, 70, 88, 95, 81, 60, 73]
```

Sample Output

```
Original scores: [78, 85, 92, 66, 70, 88, 95, 81, 60, 73]
Average score: 78.8
Scores above average: [85, 92, 88, 95, 81]
Highest score: 95
Lowest score: 60
Number of students below average: 5
```

3. Problem Statement : Python List Practice: Even and Odd Numbers Statistics

You are given a list of integers representing random numbers:

```
numbers = [12, 7, 9, 20, 15, 8, 33, 42, 5, 18]
```

Write a Python program to perform the following tasks:

1. **Separate Even and Odd Numbers** Create two new lists: one containing **even numbers** and the other containing **odd numbers**.
2. **Calculate Sum and Average** Compute the sum and average of the even numbers and odd numbers separately.
3. **Find Maximum and Minimum** Determine the highest and lowest numbers in the original list.
4. **Count Numbers Above Average** Count how many numbers in the original list are **greater than the overall average**.
5. **Print the Results** Your program should print:
    - Original list of numbers
    - List of even numbers and list of odd numbers
    - Sum and average of even numbers
    - Sum and average of odd numbers
    - Maximum and minimum numbers in the original list
    - Number of numbers greater than the overall average

Sample Input

```
numbers = [12, 7, 9, 20, 15, 8, 33, 42, 5, 18]
```

Sample Output

```
Original numbers: [12, 7, 9, 20, 15, 8, 33, 42, 5, 18]
Even numbers: [12, 20, 8, 42, 18]
Odd numbers: [7, 9, 15, 33, 5]
Sum of even numbers: 100, Average: 20.0
Sum of odd numbers: 69, Average: 13.8
Maximum number: 42, Minimum number: 5
Numbers greater than overall average (17.9): 5
```
