



Day 11: Introduction to lists, Indexing and slicing in lists, List Comprehension

Problem 1: Basic List Initialization and Operations

Description:

You have a list of integers: `[5, 10, 15, 20]`. Your task is to:

1. Append the number `25` to the end of the list.
2. Insert the number `7` at the second position of the list (index 1).
3. Print the modified list.

Output:

- The modified list.

Example Output:

```
[5, 7, 10, 15, 20, 25]
```

Problem 2: Calculating Sum and Average

Description:

Given the list of integers: `[3, 6, 9, 12]`, your task is to:

1. Calculate and print the sum of the elements in the list.
2. Calculate and print the average of the elements in the list.

Output:

- The sum of the list elements.
- The average of the list elements.

Example Output:

```
Sum: 30
Average: 7.5
```

Problem 3: Concatenating Lists

Description:

You have two lists of integers: `list1 = [1, 2, 3]` and `list2 = [4, 5, 6]`. Your task is to:

1. Concatenate these two lists into one.
2. Print the concatenated list.

Output:

- The concatenated list.

Example Output:

```
[1, 2, 3, 4, 5, 6]
```

Problem 4: List Length and Membership

Description:

Given the list `[8, 16, 24, 32]`, your task is to:

1. Print the length of the list.
2. Check if the number `24` is in the list and print a message indicating its presence.

Output:

- The length of the list.
- A message indicating whether the number `24` is in the list.

Example Output:

```
Length: 4
24 is present in the list.
```

Problem 5: Reversing a List

Description:

Given the list `[1, 3, 5, 7]`, your task is to:

1. Reverse the list.
2. Print the reversed list.

Output:

- The reversed list.

Example Output:

```
[7, 5, 3, 1]
```

Indexing and Slicing in Lists

Problem 1: Accessing Elements**Description:**

Given the list `[10, 20, 30, 40, 50]`, your task is to:

1. Print the first element of the list.
2. Print the last element of the list.
3. Print the second-to-last element of the list.

Output:

- The first element.
- The last element.
- The second-to-last element.

Example Output:

```
First element: 10
Last element: 50
Second-to-last element: 40
```

Problem 2: Slicing a List**Description:**

Given the list `[1, 2, 3, 4, 5, 6, 7, 8]`, your task is to:

1. Print the first 4 elements of the list.
2. Print the elements from index 3 to 6 (inclusive).

Output:

- The first 4 elements.
- The elements from index 3 to 6.

Example Output:

```
First 4 elements: [1, 2, 3, 4]
Elements from index 3 to 6: [4, 5, 6, 7]
```

Problem 3: Slicing with Steps**Description:**

Given the list `[2, 4, 6, 8, 10, 12]`, your task is to:

1. Print every second element of the list.
2. Print every third element starting from the first element.

Output:

- Every second element.
- Every third element starting from the first element.

Example Output:

```
Every second element: [2, 6, 10]
Every third element starting from first: [2, 8]
```

Problem 4: Using Negative Indices**Description:**

Given the list `[5, 10, 15, 20, 25]`, your task is to:

1. Print the last 3 elements of the list.
2. Print the elements from the second-to-last to the first element in reverse order.

Output:

- The last 3 elements.
- The elements from the second-to-last to the first element in reverse order.

Example Output:

```
Last 3 elements: [15, 20, 25]
Elements from second-to-last to first in reverse: [20, 15, 10]
```

Problem 5: Slicing for Sublist Creation**Description:**

Given the list `[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]`, your task is to:

1. Create and print a sublist consisting of the middle 4 elements.
2. Create and print a sublist consisting of the first 5 elements excluding the last one.

Output:

- The middle 4 elements.
- The first 5 elements excluding the last one.

Example Output:

```
Middle 4 elements: [4, 5, 6, 7]
First 5 elements excluding the last one: [1, 2, 3, 4, 5]
```

List Comprehension**Problem 1: Generating Squares****Description:**

Given the list `[2, 4, 6, 8]`, your task is to:

1. Use list comprehension to create a new list with the squares of all integers.
2. Print the new list.

Output:

- The list of squares.

Example Output:

```
[4, 16, 36, 64]
```

Problem 2: Filtering Even Numbers

Description:

Given the list `[1, 2, 3, 4, 5, 6]`, your task is to:

1. Use list comprehension to create a new list containing only the even numbers.
2. Print the new list.

Output:

- The list of even numbers.

Example Output:

```
[2, 4, 6]
```

Problem 3: Capitalizing Words

Description:

Given the list of words `['apple', 'banana', 'cherry']`, your task is to:

1. Use list comprehension to create a new list where each word is capitalized.
2. Print the new list.

Output:

- The list of capitalized words.

Example Output:

```
['APPLE', 'BANANA', 'CHERRY']
```

Problem 4: Combining Lists with Conditions

Description:

Given the lists `list1 = [10, 20, 30]` and `list2 = [15, 25, 35]`, your task is to:

1. Use list comprehension to create a new list that contains elements from `list1` that are greater than the corresponding elements in `list2`.
2. Print the new list.

Output:

- The list of elements from `list1` that are greater than corresponding elements in `list2`.

Example Output:

```
[]
```