Problem 1: Number Classification with Conditionals

Write a program that takes a number as input and checks:
- If it is positive, negative, or zero.
- Then check if the number is even or odd.

Example Input:
Enter a number: -4

Example Output:
-4 is negative.
-4 is even.

Bonus:
Use a ternary operator to assign 'Even' or 'Odd' to a variable and print it.

Problem 2: Age Eligibility Check

Ask the user for their age and income. Print:
- If age >= 18 and income >= 50000: 'Eligible for premium membership.'
- If age >= 18 and income < 50000: 'Eligible for standard membership.'
- Else: 'Not eligible for membership.'

Bonus:
Use nested if statements to make the decision.

Problem 3: For Loop Practice

Create a list of numbers from 1 to 5. Use a for loop to print the square of each number.

Example Output:
1
4
9
16
25

Bonus:
Also print only even squares using an if condition inside the loop.

Problem 4: While Loop Game

Write a guessing game using while loop:
- Let the correct answer be 7.
- Keep asking the user to guess until they guess correctly.
- Print whether their guess is too low or too high.

Bonus:
Count and print how many attempts the user took.

Problem 5: List Operations

Create a list of 5 fruits. Then:
- Add a new fruit using append()
- Replace the second item
- Remove one fruit using remove()

Bonus:
Print the final list and its length using len().

Problem 6: Dictionary Practice

Create a dictionary of three students and their grades.
- Update one grade
- Add a new student
- Remove one student
- Print all student names and grades using a loop

Bonus:
Print the average grade of all students.

Problem 7: Tuple Slicing

Create a tuple with numbers from 0 to 9.
- Print the first 3 items
- Print the last 3 items
- Print every second item

Bonus:
Try changing an item in the tuple and write the error message as a comment.

Problem 8: Set Operations

Use two sets of student names. Perform:
- Union
- Intersection
- Difference
- Add and remove elements

Bonus:

Check if a specific name exists in the set using 'in'.

Problem 9: List Comprehension

Create a list from 1 to 10.
- Use list comprehension to create a new list of their squares.
- Use list comprehension to filter even numbers.

Bonus:
Print the sum of the squared list using sum().

Problem 10: Data Structure Summary

Create and print one example of each:

1. List

Create a list with at least 3 elements.

Print the list.

Comment on its order, mutability, and duplicate behavior.

2. Dictionary

Create a dictionary with at least 2 key-value pairs.

Print the dictionary.

Comment on its order, mutability, and duplicate behavior (Note: Keys must be unique, values can be duplicated).

3. Tuple

Create a tuple with at least 3 elements.

Print the tuple.

Comment on its order, mutability, and duplicate behavior.

4. Set

Create a set with at least 3 elements (you can include duplicates).

Print the set.

Comment on its order, mutability, and duplicate behavior.

Show their key properties like order, mutability, and duplicates.

Bonus:
Write a comment summarizing the key difference between list and tuple.