Python Assignment List Tuples and methods

Basic List Operations

1. Create a list of five numbers and append a new number to it. Print the updated list.
2. Extend a list `[1, 2, 3]` with another list `[4, 5, 6]`. Print the result.
3. Insert the string `"Python"` at index `2` in the list `["Java", "C++", "JavaScript", "Ruby"]`.
4. Remove the first occurrence of the number `10` from the list `[10, 20, 30, 10, 40]`.
5. Use the `pop()` method to remove the last element from `[100, 200, 300, 400]` and print the modified list.

Intermediate List Operations

6. Count how many times the number `5` appears in the list `[5, 10, 5, 20, 5, 30]`.
7. Sort the list `[9, 1, 8, 3, 5]` in ascending and descending order.
8. Reverse the list `["apple", "banana", "cherry"]` using the `reverse()` method.
9. Create a copy of the list `[1, 2, 3, 4, 5]` and store it in another variable. Modify the copied list and print both lists.
10. Clear all elements from a list `["hello", "world", "python"]` using the `clear()` method.

Tuple-Based Questions

11. Create a tuple with 5 different fruits and print the third fruit.
12. Convert the tuple `(10, 20, 30, 40, 50)` into a list, remove the number `30`, and convert it back into a tuple.
13. Try to append an element to the tuple `("A", "B", "C")`. What happens? How can you modify a tuple indirectly?
14. Unpack the tuple `(100, 200, 300)` into three separate variables and print them.
15. Count the occurrences of `7` in the tuple `(7, 1, 7, 3, 7, 5)`.

Advanced Problems

16. Write a function that takes a list and returns a new list with all even numbers removed.
17. Create a function that accepts a list and returns a new list with elements sorted in descending order without using the `sort()` method.
18. Given a list of numbers, write a program to remove all duplicate elements and print the unique elements.
19. Given a tuple of names `("Alice", "Bob", "Charlie", "Alice", "David")`, convert it into a list, remove duplicates, and convert it back to a tuple.

20. Create a program that takes a list of mixed data types (`int, str, float`) and separates integers into one list, strings into another, and floats into another.