Title of the Assignment: Write a program for analysis of quick sort by using deterministic and randomized variant.

Code:

```
import random

def deterministic_quick_sort(arr):
    if len(arr) <= 1:
        return arr

    pivot = arr[0]
    lesser = []
    equal = []
    greater = []

    for element in arr:
        if element < pivot:
            lesser.append(element)
        elif element == pivot:
            equal.append(element)
        else:
            greater.append(element)

    return deterministic_quick_sort(lesser) + equal + deterministic_quick_sort(greater)

def randomized_quick_sort(arr):
    if len(arr) <= 1:
        return arr

    pivot = random.choice(arr)
    lesser = []
    equal = []
    greater = []

    for element in arr:
        if element < pivot:
            lesser.append(element)
        elif element == pivot:
            equal.append(element)
```

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        else:
            greater.append(element)

    return randomized_quick_sort(lesser) + equal + randomized_quick_sort(greater)

if __name__ == "__main__":
    arr = [3, 6, 8, 10, 1, 2, 1]

    # Deterministic Quick Sort
    sorted_arr_deterministic = deterministic_quick_sort(arr.copy())
    print("Deterministic Quick Sort:")
    print(sorted_arr_deterministic)

    # Randomized Quick Sort
    sorted_arr_randomized = randomized_quick_sort(arr.copy())
    print("\nRandomized Quick Sort:")
    print(sorted_arr_randomized)
```

Output:

```
Deterministic Quick Sort:
[1, 1, 2, 3, 6, 8, 10]

Randomized Quick Sort:
[1, 1, 2, 3, 6, 8, 10]
```