INSTITUTE OF COMPUTER TECHNOLOGY

B-TECH COMPUTER SCIENCE ENGINEERING 2025-26

SUBJECT:ALGORITHM ANALYSIS & DESIGN

NAME: Rahul Prajapati

ENRLL. NO: 23162171020

BRANCH: CYBER SECURITY

BATCH: 52

PRACTICAL_04

Aim: You are working at the cash counter at a fun-fair, and you have three types of coins available to you in infinite quantities (coins are Rs. 1, Rs. 4 and Rs. 6). You are required to calculate the minimum numbers of coins required for changing the value of Rs. 9.

Design the algorithm for the same and implement using the programming language of your choice. Make comparative analysis for various use cases & input size.

CODE:

```python
import random as rd

def coin_counter(coins, tests):
    coins.sort(reverse=True)
    counts = []
    for i in range(0, len(tests)):
        min_count = float("inf")
        for start in range(len(coins)):
            temp_count = 0
            total = 0
            for j in range(start, len(coins)):
                temp_coin = coins[j]
                while tests[i] > total:
                    total += temp_coin
                    temp_count += 1
                if total > tests[i]:
                    total -= temp_coin
                    temp_count -= 1
            if total == tests[i] and temp_count < min_count:
                min_count = temp_count
        print(f"minimum number of coin for {tests[i]} is {min_count}")
        counts.append(min_count)
    return counts
```

```python
coins = []
num_coin = int(input("enter number of coins you have:"))
for k in range(0, num_coin):
        coins.append(int(input(f"enter {k+1} coin:")))

num = int(input("enter number of test_cases you want:"))
choice = int(input("<0> take random element \n<1> enter elements manualy \n0 or 1:"))
tests = []

if choice == 0:
    for i in range(0, num):
        tests.append(rd.randint(1, 100))
    print(f"list:{tests}")
    coin_counter(coins, tests)
elif choice == 1:
    for i in range(0, num):
        tests.append(int(input(f"enter {i+1} element:")))
    print(f"list:{tests}")
    coin_counter(coins, tests)
else:
    print("invalid choice :(")

print("thank you:)")
```

OUTPUT:

```
enter number of coins you have:3
enter 1 coin:4
enter 2 coin:1
enter 3 coin:6
enter number of test_cases you want:5
<0> take random element
<1> enter elements manualy
0 or 1:1
enter 1 element:12
enter 2 element:6
enter 3 element:21
enter 4 element:9
enter 5 element:8
list:[12, 6, 21, 9, 8]
minimum number of coin for 12 is 2
minimum number of coin for 6 is 1
minimum number of coin for 21 is 6
minimum number of coin for 9 is 3
minimum number of coin for 8 is 2
thank you:)
enter number of coins you have:3
enter 1 coin:4
enter 2 coin:1
enter 3 coin:6
enter number of test_cases you want:5
<0> take random element
<1> enter elements manualy
0 or 1:0
list:[33, 49, 70, 66, 32]
minimum number of coin for 33 is 8
minimum number of coin for 49 is 9
minimum number of coin for 70 is 12
minimum number of coin for 66 is 11
minimum number of coin for 32 is 7
thank you:)
```