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Question: Write a C++ program to implement the greedy algorithm for ...

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Please assist

Write a C++ program to implement the greedy algorithm for making change. Your program should accept a list of coin denominations, the amount of change to make, and outputs the minimum number of coins needed to make that amount of change.

Input

The first line of input is N , the number of coin denominations. N denominations follow, each separated by a space. You may assume that the denominations are sorted in ascending order. The next line begins with the integer M , the number of test cases to follow. M integers K_1, \dots, K_M follow, each separated by a space.

Output

For each test case i , output the minimum number of coins needed to make change for amount K_i . For each test case, output the answer on its own line.

Example Input-Output Pairs

Sample Input #1

```
7 1 2 5 10 20 50 100
3 21 83 60
```

Sample Output #1

```
2
5
2
```

Sample Input #2

```
3 1 2 5
2 25 1001
```

Sample Output #2

```
5
201
```

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Expert Answer



Anonymous answered this
203 answers

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C++ CODE-

```
#include<bits/stdc++.h>
using namespace std;
```

```
int main(){
    // n will store the number of denominations
    int n;
    cin >> n;

    // array of size n for storing denominations
    int deno[n];
    for(int i = 0 ; i < n ; i++){
        cin >> deno[i];
    }
```

```
// number of test cases
int t;
cin >> t;
```

```
// for each test case find min number of coins
while(t--){
    // total amount we have
    int amount;
    cin >> amount;
```

```
// variable for storing the number of coins
int coins = 0;
```

```
// since the array is already sorted in ascending order
// traverse the denominations array in reverse direction
```

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```

        // subtract deno[i] from amount
        amount = amount - deno[i];
        // increment the coins by 1
        coins++;
    }
}

// print the number of coins
cout << coins << endl;
}
return 0;
}

```

Please refer to the image of code for proper indentation-

```

1  #include<bits/stdc++.h>
2  using namespace std;
3
4  int main(){
5      // n will store the number of denominations
6      int n;
7      cin >> n;
8
9      // array of size n for storing denominations
10     int deno[n];
11     for(int i = 0 ; i < n ; i++){
12         cin >> deno[i];
13     }
14
15     // number of test cases
16     int t;
17     cin >> t;
18
19     // for each test case find min number of coins
20     while(t--){
21         // total amount we have
22         int amount;
23         cin >> amount;
24
25         // variable for storing the number of coins
26         int coins = 0;
27
28         // since the array is already sorted in ascending order
29         // traverse the denominations array in reverse direction
30         for(int i = n - 1 ; i >= 0 ; i--){
31             // while amount left is greater than or equal to deno[i]
32             while (amount >= deno[i]) {
33                 // subtract deno[i] from amount
34                 amount = amount - deno[i];
35                 // increment the coins by 1
36                 coins++;
37             }
38         }
39
40         // print the number of coins
41         cout << coins << endl;
42     }
43     return 0;
44 }

```

Screenshot of sample input and output-

```
7 1 2 5 10 20 50 100
3 21 83 60
```

Output

```
2
5
2
```

Input

```
3 1 2 5
2 25 1001
```

Output

```
5
201
```

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