

GE23131-Programming Using C-2024

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Question 1

Correct

Marked out of 1.00

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Status: Finished

Started: Thursday, 14 January 2025, 9:33 PM

Completed: Thursday, 14 January 2025, 10:02 PM

Duration: 29 mins 34 secs

Objective

In this challenge, we're going to use loops to help us do some simple math. Check out the Tutorial tab to learn more.

Task

Given an integer, n , print its first 10 multiples. Each multiple $n \times i$ (where $1 \leq i \leq 10$) should be printed on a new line in the form: $n \times i = \text{result}$.

Input Format

A single integer, n .

Constraints

$2 \leq n \leq 20$

Output Format

Print 10 lines of output, each line i (where $1 \leq i \leq 10$) contains the result of $n \times i$ in the form: $n \times i = \text{result}$.

Sample Input

2

Sample Output

$2 \times 1 = 2$
 $2 \times 2 = 4$
 $2 \times 3 = 6$
 $2 \times 4 = 8$
 $2 \times 5 = 10$
 $2 \times 6 = 12$
 $2 \times 7 = 14$
 $2 \times 8 = 16$
 $2 \times 9 = 18$
 $2 \times 10 = 20$

Answer: (yourly engine: 0%)

```
1 #Write a program to print the first 10 multiples of a given integer n.
2 def main():
3     n = int(input())
4     for i in range(1, 11):
5         result = n * i
6         print(f"{n} x {i} = {result}")
7     return 0
8 if __name__ == '__main__':
9     main()
10
```

	Input	Expected	Got	
✓	2	$2 \times 1 = 2$ $2 \times 2 = 4$ $2 \times 3 = 6$ $2 \times 4 = 8$ $2 \times 5 = 10$ $2 \times 6 = 12$ $2 \times 7 = 14$ $2 \times 8 = 16$ $2 \times 9 = 18$ $2 \times 10 = 20$	$2 \times 1 = 2$ $2 \times 2 = 4$ $2 \times 3 = 6$ $2 \times 4 = 8$ $2 \times 5 = 10$ $2 \times 6 = 12$ $2 \times 7 = 14$ $2 \times 8 = 16$ $2 \times 9 = 18$ $2 \times 10 = 20$	✓

Passed all tests! ✓

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Question 2

Correct

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A nutritionist is labelling all the best power foods in the market. Every food item arranged in a single line, will have a value beginning from 1 and increasing by 1 for each, until all items have a value associated with them. An item's value is the same as the number of macronutrients it has. For example, food item with value 1 has 1 macronutrient, food item with value 2 has 2 macronutrients, and incrementing in this fashion.

The nutritionist has to recommend the best combination to patients, i.e. maximum total of macronutrients. However, the nutritionist must avoid prescribing a particular sum of macronutrients (an 'unhealthy' number), and this sum is known. The nutritionist chooses food items in the increasing order of their value. Compute the highest total of macronutrients that can be prescribed to a patient, without the sum matching the given 'unhealthy' number.

Here's an illustration:

Given 4 food items (since value 1,2,3 and 4), and the unhealthy sum being 6 macronutrients, on choosing items 1, 2, 3 \rightarrow the sum is 6, which matches the 'unhealthy' sum. Hence, one of the three needs to be skipped. Thus, the best combination is from among:

- $2 + 3 + 4 = 9$
- $1 + 3 + 4 = 8$
- $1 + 2 + 4 = 7$

Since $2 + 3 + 4 = 9$ allows for maximum number of macronutrients, 9 is the right answer.

Complete the code in the editor below. It must return an integer that represents the maximum total of macronutrients, modulo 1000000007 ($10^9 + 7$).

It has the following:

n : an integer that denotes the number of food items

k : an integer that denotes the unhealthy number

Constraints

- $1 \leq n \leq 2 \times 10^6$
- $1 \leq k \leq 4 \times 10^{15}$

Input Format For Custom Testing

The first line contains an integer, n , that denotes the number of food items.

The second line contains an integer, k , that denotes the unhealthy number.

Sample Input 0

2
2

Sample Output 0

3

Explanation 0

The following sequence of $n = 2$ food items:

1. Item 1 has 1 macronutrients.
2. $1 + 2 = 3$ observe that this is the max total, and having avoided having exactly $k = 2$ macronutrients.

Sample Input 1

2
1

Sample Output 1

2

Explanation 1

1. Choose one item 1 (has value 1) and one 2 (has the highest of available

Explanation 1

1. Cannot use item 1 because $k = 1$ and sum $\geq k$ has to be avoided at any time.
2. Hence, max total is achieved by $sum = 0 + 2 = 2$.

Sample Case 2

Sample Input For Custom Testing

Sample Input 2

3
3

Sample Output 2

5

Explanation 2

$2 + 3 = 5$ is the best case for maximum nutrients.

Answers (penalty regime: 0 %)

```
1 #include<stdio.h>
2 int main(){
3     long long int n,t,i,nut=0;
4     scanf("%lld",&n,&t);
5     for(i=0;i<n;i++)
6     {
7         nut=nut+i;
8         if(nut==t)
9         {
10             nut=nut-i;
11         }
12     }
13     printf("%lld",nut%1000000007);
14 }
```

	Input	Expected	Got	
✓	2	3	3	✓
✓	2	2	2	✓
✓	3	5	5	✓

Passed all tests! ✓

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Question 3
Answered
Correct
100%

Consider the function $f(x)$ defined as follows: $f(x) = \begin{cases} x^2 & \text{if } x \text{ is even} \\ x^3 & \text{if } x \text{ is odd} \end{cases}$

For example, given the function $f(x) = \begin{cases} x^2 & \text{if } x \text{ is even} \\ x^3 & \text{if } x \text{ is odd} \end{cases}$, $f(4) = 16$ and $f(5) = 125$.

Complete the code in the editor below. The function should return a long integer value of the $f(x)$ integer value of x .

Here are the inputs:

x is an integer

$f(x)$ is an integer

Constraints:

$1 \leq x \leq 10^9$

$1 \leq f(x) \leq 10^{18}$

Input Format for Custom Testing

Input from stdin will be processed as follows and passed to the function:

The first line contains an integer x , the number to test.

The second line contains an integer y , the expected value of the function to return.

Sample Input 0

10

1000

Sample Output 0

1000

Explanation 0

Testing: $x = 10$ is even, so $f(x) = 10^2 = 100$. Then the output $f(x) = 1000$ is not correct.

Sample Input 1

10

1000

Sample Output 1

1000

Explanation 1

Testing: $x = 10$ is even, so $f(x) = 10^2 = 100$. Then the output $f(x) = 1000$ is not correct.

Sample Input 2

10

1000

Sample Output 2

1000

Explanation 2

Testing: $x = 10$ is even, so $f(x) = 10^2 = 100$. Then the output $f(x) = 1000$ is not correct.

Sample Input 3

10

1000

Sample Output 3

1000

Explanation 3

Testing: $x = 10$ is even, so $f(x) = 10^2 = 100$. Then the output $f(x) = 1000$ is not correct.

Sample Input 4

10

1000

Sample Output 4

1000

Explanation 4

Testing: $x = 10$ is even, so $f(x) = 10^2 = 100$. Then the output $f(x) = 1000$ is not correct.

Sample Input 5

10

1000

Sample Output 5

1000

Explanation 5

Testing: $x = 10$ is even, so $f(x) = 10^2 = 100$. Then the output $f(x) = 1000$ is not correct.

Sample Input 6

10

1000

Sample Output 6

1000

Explanation 6

Testing: $x = 10$ is even, so $f(x) = 10^2 = 100$. Then the output $f(x) = 1000$ is not correct.

Sample Input 7

10

1000

Sample Output 7

1000

Explanation 7

Testing: $x = 10$ is even, so $f(x) = 10^2 = 100$. Then the output $f(x) = 1000$ is not correct.

Sample Input 8

10

1000

Sample Output 8

1000

Explanation 8

Testing: $x = 10$ is even, so $f(x) = 10^2 = 100$. Then the output $f(x) = 1000$ is not correct.

Sample Input 9

10

1000

Sample Output 9

1000

Explanation 9

Testing: $x = 10$ is even, so $f(x) = 10^2 = 100$. Then the output $f(x) = 1000$ is not correct.

Answer: (public domain C++)

```
1 // Solution 1
2 #include <iostream>
3 using namespace std;
4
5 long long f(long long x) {
6     if (x % 2 == 0) {
7         return x * x;
8     } else {
9         return x * x * x;
10    }
11 }
12
13 int main() {
14     long long x;
15     cin >> x;
16     cout << f(x) << endl;
17     return 0;
18 }
```

Test Case 1

10

1000

Test Case 2

10

1000

Test Case 3

10

1000

Test Case 4

10

1000

Test Case 5

10

1000

Test Case 6

10

1000

Test Case 7

10

1000

Test Case 8

10

1000

Test Case 9

10

1000

Test Case 10

10

1000

Test Case 11

10

1000

Test Case 12

10

1000

Test Case 13

10

1000

Test Case 14

10

1000

Test Case 15

10

1000

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Question 1: Given an array A of 1000 integers and another non-negative integer X, find if there exists 2 distinct indices i and j such that $A[i] - A[j] = X$.

Input Format

1. The first line contains the value of X. Following 2 lines contain:
2. An array A of 1000 integers of the array.
3. The non-negative integer X.

Output Format

Print 1 if such a pair exists and 0 if not.

Sample Input

Input

1
1 1 1 1
4

Output

1

Input

1
1 1 1 1
99

Output

0

Answer: (Initially register 0%)

```
1 #include <iostream>
2 using namespace std;
3 int main()
4 {
5     int X;
6     cin >> X;
7     int A[1000];
8     for (int i = 0; i < 1000; i++)
9     {
10         cin >> A[i];
11     }
12     int flag = 0;
13     for (int i = 0; i < 1000; i++)
14     {
15         for (int j = i + 1; j < 1000; j++)
16         {
17             if (A[i] - A[j] == X)
18             {
19                 flag = 1;
20                 break;
21             }
22         }
23     }
24     cout << flag << endl;
25     return 0;
26 }
```

Input	Expected	Got
1	1	1
1	0	0

Correct all inputs ✓

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Question 3
Correct
Marked out of 1.00
Flag question

The number of goals achieved by two football teams in matches in a league is given in the form of two lists. Consider

- Football team A, has played three matches, and has scored { 1, 2, 3 } goals in each match respectively.
- Football team B, has played two matches, and has scored { 2, 4 } goals in each match respectively.
- Your task is to compute, for each match of team B, the total number of matches of team A, where team A has scored less than or equal to the number of goals scored by team B in that match.
- In the above case,
 - For 2 goals scored by team B in its first match, team A has 2 matches with scores 1 and 2.
 - For 4 goals scored by team B in its second match, team A has 3 matches with scores 1, 2 and 3.

Hence, the answer {2, 3}.

Complete the code in the editor below. The program must return an array of m positive integers, one for each $matches[i]$ representing the total number of elements $nums[i]$ satisfying $nums[j] \leq matches[i]$ where $0 \leq j < n$ and $0 \leq i < m$, in the given order.

It has the following

$nums[nums[0] \dots nums[n-1]]$: first array of positive integers
 $matches[matches[0] \dots matches[m-1]]$: second array of positive integers

Constraints

- $2 \leq n, m \leq 10^5$
- $1 \leq nums[i] \leq 10^9$, where $0 \leq i < n$.
- $1 \leq matches[i] \leq 10^9$, where $0 \leq i < m$.

Input Format For Custom Testing

Input from stdin will be processed as follows and passed to the function.

The first line contains an integer n , the number of elements in $nums$.

The next n lines each contain an integer describing $nums[i]$ where $0 \leq i < n$.

The next line contains an integer m , the number of elements in $matches$.

The next m lines each contain an integer describing $matches[i]$ where $0 \leq i < m$.

Sample Case 0

Sample Input 0

```
4
1
4
2
4
2
3
5
```

Sample Output 0

```
2
4
```

Explanation 0

We are given $n = 4$, $nums = [1, 4, 2, 4]$, $m = 2$, and $matches = [2, 5]$.

- For $matches[0] = 2$, we have 2 elements in $nums$ ($nums[0] = 1$ and $nums[2] = 2$) that are $\leq matches[0]$.
- For $matches[1] = 5$, we have 4 elements in $nums$ ($nums[0] = 1$, $nums[1] = 4$, $nums[2] = 2$, and $nums[3] = 4$) that are $\leq matches[1]$.

Thus, the function returns the array [2, 4] as the answer.

4
8
4
3
1
7
8

Sample Output 1

1
0
3
4

Explanation 1

We are given: $n = 5$, $nums = [2, 10, 5, 4, 8]$, $m = 4$, and $means = [3, 1, 7, 8]$.

- For $means[0] = 3$, we have 1 element in $nums$ ($nums[0] = 2$) that is $\leq means[0]$.
- For $means[1] = 1$, there are 0 elements in $nums$ that are $\leq means[1]$.
- For $means[2] = 7$, we have 3 elements in $nums$ ($nums[0] = 2$, $nums[2] = 5$, and $nums[3] = 4$) that are $\leq means[2]$.
- For $means[3] = 8$, we have 4 elements in $nums$ ($nums[0] = 2$, $nums[2] = 5$, $nums[3] = 4$, and $nums[4] = 8$) that are $\leq means[3]$.

Thus, the function returns the array $[1, 0, 3, 4]$ as the answer.

Answer: (primary region: 0 %)

```
1 def countSmaller(nums):  
2     ans = [0] * len(nums)  
3     for i in range(len(nums)-1, -1, -1):  
4         left = 0  
5         for j in range(i+1, len(nums)):  
6             if nums[j] < nums[i]:  
7                 left += 1  
8         ans[i] = left  
9     return ans
```

Input	Expected	Got
4	2	2
5	4	4
6	2	2
7	3	3
8	4	4
9	5	5

Passed all tests! ✓

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Question 1

Correct

Marked out of 100

100%

Correct

Status: Finished

Started: Tuesday, 16 January 2025, 11:48 AM

Completed: Tuesday, 16 January 2025, 12:05 PM

Duration: 20 mins 59 secs

Given an array of numbers and a window of size k. Print the maximum of numbers inside the window for each step as the window moves from the beginning of the array.

Input Format
Input contains the array size, no of elements and the window size

Output Format
Print the maximum of numbers

Constraints
1 <= size <= 1000

Sample Input 1
8
1 3 5 2 1 8 6 9

Sample Output 1
3
5 5 8 8 9

For example:

Input	Result
8 1 3 5 2 1 8 6 9	5 5 8 8 9
10 3 7 5 1 2 9 8 5 3 2	7 7 5 9 9 8 5

Answer: (Correctly explained: 0%)

```
1 #include <stdio.h>
2 int main()
3 {
4     int n,k;
5     scanf("%d",&n);
6     int arr[n];
7     for(int i=0;i<n;i++)
8     {
9         scanf("%d",&arr[i]);
10    }
11    scanf("%d",&k);
12    for(int i=0;i<n-k+1;i++)
13    {
14        int max=arr[i];
15        for(int j=i+1;j<=i+k-1;j++)
16        {
17            if(arr[j]>max)
18            {
19                max=arr[j];
20            }
21            printf("%d ",max);
22        }
23    }
24 }
```

Input	Expected	Got	
8 1 3 5 2 1 8 6 9	5 5 8 8 9	5 5 8 8 9	✓
10 3 7 5 1 2 9 8 5 3 2	7 7 5 9 9 8 5	7 7 5 9 9 8 5	✓

Passed all tests! ✓

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Question 2
Correct
Marked out of 1.00
Flag question

Given an array and a threshold value find the output.

Input: 5 8 10 13 6 2

Threshold = 3

Output count = 17

Explanation:

Number	Parts	Counts
5	{5,2}	2
8	{5,3,2}	3
10	{5,3,3,1}	4
13	{5,3,3,3,1}	5
6	{5,3}	2
2	{2}	1

Input Format

N - no. of elements in an array

Array of elements

Threshold value

Output Format

Display the count

Sample Input 1

6

5 8 10 13 6 2

3

Sample Output 1

17

For example:

Input	Result
6 5 8 10 13 6 2	17
7 20 35 57 58 56 87 38	33

Answer: (correctly explains 0 %)

```
1 #include<stdio.h>
2 int main()
3 {
4     int n,i,count=0;
5     scanf("%d",&n);
6     int arr[n];
7     for(int i=0;i<n;i++)
8     {
9         scanf("%d",&arr[i]);
10    }
11    scanf("%d",&t);
12    for(int j=0;j<n;j++)
13    {
14        while(arr[j]>=t)
15        {
16            arr[j]=arr[j]-t;
17            count++;
18        }
19    }
20    printf("%d",count);
21 }
```

Input	Expected	Got
✓ 6 5 8 10 13 6 2	17	17 ✓
✓ 7 20 35 57 58 56 87 38	33	33 ✓

Passed all tests! ✓

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Question 3

Correct

Marked out of 1.00

Flag question

Output is a merged array without duplicates.

Input Format

N1 - no. of elements in array 1

Array elements for array 1

N2 - no. of elements in array 2

Array elements for array2

Output Format

Display the merged array

Sample Input 1

5

1 2 3 6 9

4

2 4 5 10

Sample Output 1

1 2 3 4 5 6 9 10

For example:

Input	Result
5	1 2 3 4 5 6 9 10
4	2 4 5 10

Answer: (penalty regime: 0%)

```
1 #include<iostream.h>
2 using namespace std;
3
4 int main()
5 {
6     int n1,n2;
7     cout<<"n1 :";
8     cin>>n1;
9     int arr1[n1];
10    for(int i=0;i<n1;i++)
11        cin>>arr1[i];
12    cout<<"n2 :";
13    cin>>n2;
14    int arr2[n2];
15    for(int i=0;i<n2;i++)
16        cin>>arr2[i];
17
18    int arr3[n1+n2];
19    int i=0,j=0,k=0;
20    while(i<n1 || j<n2)
21    {
22        if(i<n1 && (j==n2 || arr1[i]<arr2[j]))
23            arr3[k++] = arr1[i++];
24        else if(j<n2 && (i==n1 || arr2[j]<arr1[i]))
25            arr3[k++] = arr2[j++];
26        else
27        {
28            arr3[k++] = arr1[i];
29            i++;
30            arr3[k++] = arr2[j];
31            j++;
32        }
33    }
34    for(int i=0;i<n1+n2;i++)
35        cout<<arr3[i]<<" ";
36    cout<<endl;
37    return 0;
38 }
```

Input	Expected	Got
5	1 2 3 4 5 6 9 10	1 2 3 4 5 6 9 10
4	2 4 5 10	2 4 5 10

Passed all tests! ✓

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