**Algorithmic Problem Solving 2021**

**17ECSE309**

**Q-Box Assignment Set**

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**Question 01**

Title: What will the price be?

Level: Easy

Concepts Tested: Mathematics

**Problem Statement:**

Vinay is interested to invest in stock market and he is looking for the potential stock to invest. It is given that the current price of a stock is **X**. He wants to calculate what the price of that stock will be after **two** **years** if the price increases at **P%** /annum and **Q%** /annum in those 2 years. As he is new, he asks you to help him out.

**Input Format:**

The only line of input contains three space separated integers **X, P** and **Q**.

**Constraints:**

1 <= X <= 10^8

-1000 <= P, Q <= 1000

**Output Format:**

A single integer value denoting the price after two years.

**Solution:** (Language: C++)

#include <bits/stdc++.h>

using namespace std;

int main()

{

float x,p,q;

cin>>x>>p>>q;

float result=p+q+((p\*q)/100);

result = x + ((result\*x)/100);

long long answer = (long long)result;

cout<<answer<<endl;

return 0;

}

**Sample input:**

100000 20 10

**Sample output:**

132000

**Test Cases:**

1. Input: 100000 20 1

Output: 121200

1. Input: 100000 -20 10

Output: 88000

1. Input: 98766789 5 5

Output: 108890392

1. Input: 12344321 0 0

Output: 12344321

1. Input: 100000 -10 10

Output: 99000

1. Input: 1000 1000 -1000

Output: -99000

1. Input: 100000 -20 -10

Output: 72000

1. Input: 100000000 1000 1000

Output: 12099999744

**Question 02:**

Title: Least Return

Level: Medium

Concepts Tested: Merge Sort

**Problem Statement:**

Vinay is a businessman who owns many shops located across two different locations. The first location has **N** shops with the profit/loss of **A1, A2, A3, ... AN.** And the other location has **M** shops with the profit/loss of **B1, B2, B3, ... BM**. The shop number indicates the total profit/loss of that shop in a month. Vinay wants to store the total profit/loss of all the shops he own in a single place. But something came up and he asked for your help. As he has many shops, he asks you to store the total profit/loss of the **X** shops with least returns among the shops he own.

He tells you a little secret to make your task a bit easier i.e., for any integer i, **Ai < Ai+1** and **Bi < Bi+1**. Help Vinay by completing this task.

**Input Format:**

The first line of input contains three space separated integers N, M and X.

The second line has N-space separated integers A1, A2, A3, .... , AN.

The third line has M-space separated integers B1, B2, B3, ... BM.

**Constraints:**

1 <= N, M <= 10^6

1 <= X <= (N+M)

-10^9 <= Ai <= 10^18

-10^9 <= Bi <= 10^18

**Output Format:**

A single line containing **X** shops with least returns among the shops he own.

**Solution:**

Language of choice: C++

//Solution starts here

#include <bits/stdc++.h>

using namespace std;

#define fr(n) for(int i=0;i<n;i++)

#define ll long long

#define MOD 1000'000'007

#define INFNTY 1e18

int main()

{

int n,m,x;

cin>>n>>m>>x;

ll a[n+1],b[m+1];

ll result[n+m];

fr(n)

cin>>a[i];

fr(m)

cin>>b[i];

a[n]=INFNTY;

b[m]=INFNTY;

int count=0;

int i=0,j=0;

for(int k=0;k<(m+n);k++){

if(a[i] <= b[j]){

result[k]=a[i];

i++;

}

else{

result[k]=b[j];

j++;

}

count++;

if(count > x)

break;

}

fr(x)

cout<<result[i]<<" ";

return 0;

}

**Sample input:**

5 10 12

1 2 3 4 5

1 2 3 4 5 6 7 8 9 10

**Sample output:**

1 1 2 2 3 3 4 4 5 5 6 7

**Test Cases:**

1. Q2\_input1.txt

Q2\_output1.txt

1. Q2\_input2.txt

Q2\_output2.txt

1. Q2\_input3.txt

Q2\_output3.txt

1. Q2\_input4.txt

Q2\_output4.txt

1. Q2\_input5.txt

Q2\_output5.txt

1. Q2\_input6.txt

Q2\_output6.txt

1. Q2\_input7.txt

Q2\_output7.txt

1. Q2\_input8.txt

Q2\_output8.txt