

## HW 01: Find sqrt of X up to 3 decimal place

Example 01:  
Input:  $x = 37$   
Output: 6.082

Example 02:  
Input:  $x = 36$   
Output: 6

Example 03:  
Input:  $x = 68$   
Output: 8.246

BRUTE FORCE

## APPROACH:

- Step 01: find integer part of sqrt of  $X$   
Step 02: find precision part of sqrt of  $X$

Example 01: DRY RUN

$X = 37$	Precision = 3	Temp (Integer part) = 6
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Factor = 1 and ANS = 6

I	$I < \text{Precision}$	Factor /= 10	$J = \text{ANS}$	$J * J < X$	$\text{ANS} = J$	$J = J + \text{Factor}$
0	✓	0.1	6	36 ✓	6	6.1
			6.1	37.21 X		
1	✓	0.01	6	36 ✓	6	6.01
			6.01	36.201 ✓	6.01	6.02
			6.02	36.2404 ✓	6.02	6.03
			6.03	36.3609 ✓	6.03	6.04
			6.04	36.4816 ✓	6.04	6.05
			6.05	36.6025 ✓	6.05	6.06
			6.06	36.7236 ✓	6.06	6.07
			6.07	36.8449 ✓	6.07	6.08
			6.08	36.9664 ✓	6.08	6.09
			6.09	37.08 X		
2	✓	0.001	6.08	36.9664 ✓	6.08	6.081
			6.081	36.9786 ✓	6.081	6.082
			6.082	36.9907 ✓	6.082	6.083

			6.082	36.9907~	6.082	6.083
			6.083	37.0029X		

FINAL ANS

```

// HW 01: Find sqrt of X upto N decimal place
#include<iostream>
using namespace std;

// Step 01: find integer part of sqrt of X
int integerPart(int x) {
    int s = 0;
    int e = x;
    long long int mid = s+(e-s)/2;
    int ans = -1;

    while(s <= e){
        // kya mid hi to ans nhi hai to return mid
        if(mid*mid == x){
            return mid;
        }
        // agar mid*mid greater then hai x se to left me chale jao
        else if(mid*mid > x){
            e = mid-1;
        }
        // agar mid*mid less then hai x se to ans me mid store karlo and right me chale jao
        else{
            ans = mid;
            s = mid+1;
        }
        mid= s+(e-s)/2;
    }
    return ans;
}

// Step 02: find precision part of sqrt of X
double morePrecision(int x,int precision,int tempSol){
    double ans = tempSol;
    double factor=1;

    for(int i=0;i<precision;i++){
        factor/=10;
        for(double j=ans;j*j<x;j=j+factor){
            ans=j;
        }
    }
    return ans;
}

int main(){
    int x;
    cin>>x;

    int tempSolution = integerPart(x);
    cout<<"Integer part of square root of X: "<< tempSolution<<endl;

    double finalAns = morePrecision(x,3,tempSolution);
    cout<<"Final square root of X: "<< finalAns<<endl;

    return 0;
}

/*
Example 01:
Input: x = 37
Output: 6.082

Example 02:
Input: x = 36
Output: 6

Example 03:
Input: x = 68
Output: 8.246
*/

```

Example 03:  
Input: x = 68  
Output: 8.246  
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