

# Programming Problem Set: From Easy to Efficient Thinking

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## 1 Basic Calculations (Easy)

### 1.1 1. Multiply Two Numbers

Read two integers and print their product.

```
Input: 6 7
Output: 42
```

### 1.2 2. Celsius to Fahrenheit

Convert a temperature in Celsius to Fahrenheit.

Formula:  $F = \frac{9}{5}C + 32$

```
Input: 0
Output: 32.0
```

### 1.3 3. Time Conversion

Convert total minutes into hours and minutes.

```
Input: 135
Output: 2 hour(s) and 15 minute(s)
```

## 2 Loops and Arrays (Medium)

### 2.1 4. Factorial (Using Loop)

Compute factorial of a number  $n$ .

```
Input: 5
Output: 120
```

### 2.2 5. Count Even and Odd Numbers

Count how many numbers in a list are even or odd.

```
Input:
5
1 2 3 4 5
Output:
Even: 2
Odd: 3
```

### 2.3 6. Reverse Digits

Reverse the digits of a number.

```
Input: 1234
Output: 4321
```

## 2.4 7. Palindrome Number

Check if a number reads the same forwards and backwards.

```
Input: 121
Output: Palindrome
```

## 2.5 8. Count Vowels in a String

Count vowels (a, e, i, o, u) in a string.

```
Input: hello world
Output: 3
```

## 2.6 9. Remove Duplicates from List

Remove duplicate values from a list, preserving order.

```
Input:
7
1 2 2 3 4 4 5
Output:
1 2 3 4 5
```

# 3 Intro to Competitive Programming (Efficiency)

## 3.1 10. Two Sum (Check if Pair Exists)

Check if any two distinct numbers add to a target sum.

```
Input:
6 9
2 7 11 15 4 5
Output:
Yes
```

```
Input:
4 10
1 2 3 4
Output:
No
```

## 3.2 11. Staircase Climbing (Dynamic Programming)

You can climb 1 or 2 steps at a time. Count the number of ways to reach step  $n$ .

```
Input: 4
Output: 5
```

## 3.3 12. Prefix Sum: Range Sum Query

Preprocess an array so that multiple range sums can be answered efficiently.

```
Input :
5
1 2 3 4 5
3
1 3
0 4
2 2
Output :
9
15
3
```