

Homework 1

 Question 1: Evaluate the following expressions

(Use integer division for all / operations.)

1 $(3 + 5 * 2 + 8 / 3) - 7 / 2$

2 $10 + 6 * 3 - 4 / 2$

3 $(12 / 3) + (8 \% 5) * 2$

4 $5 * 2 - 3 * (6 / 2)$

5 $(9 - 3) * (4 + 2)$

6 $18 / 4 + 7 \% 3$

7 $2 * 3 + 10 / 5 - 1$

8 $(15 - 9 / 3) * 2 + 1$

9 $20 / 3 + 5 \% 2$

10 $(8 + 2) * 2 / 5 - 3$

Question 2: Given the following program, show the corresponding output on the screen
(assume that the user entered age = 16)

```
#include <iostream>

using namespace std;

int main()
{
    int age;
    cout << "Enter your age: ";
    cin >> age;
    cout << endl;
    if (age >= 18)
        cout << "You are eligible to vote." << endl;
    else
        cout << "You are not eligible to vote yet." << endl;
    return 0;
}
```



Question 3: Given the following program, show the corresponding output on the screen
(assume that the user entered temp = 35)

```
#include <iostream>

using namespace std;

int main()
{
    int temp;

    cout << "Enter the temperature: ";

    cin >> temp;

    cout << endl;

    if (temp > 40)
        cout << "It is a very hot day!" << endl;
    else if (temp >= 25)
        cout << "The weather is warm." << endl;
    else
        cout << "It's a cool day." << endl;

    return 0;
}
```



Question 4: Given the following program, show the corresponding output on the screen (assume that the user entered gpa=1.8)

```
#include <iostream>
using namespace std;

int main()
{
    double gpa;

    cout << "Enter the GPA: ";
    cin >> gpa;
    cout << endl;

    if (gpa >= 3.9)
        cout << "Dean\'s Honor List." << endl;
    else if (gpa < 2.0)
        cout << "The GPA is below the graduation "
        << "requirement. \n See your "
        << "academic advisor." << endl;

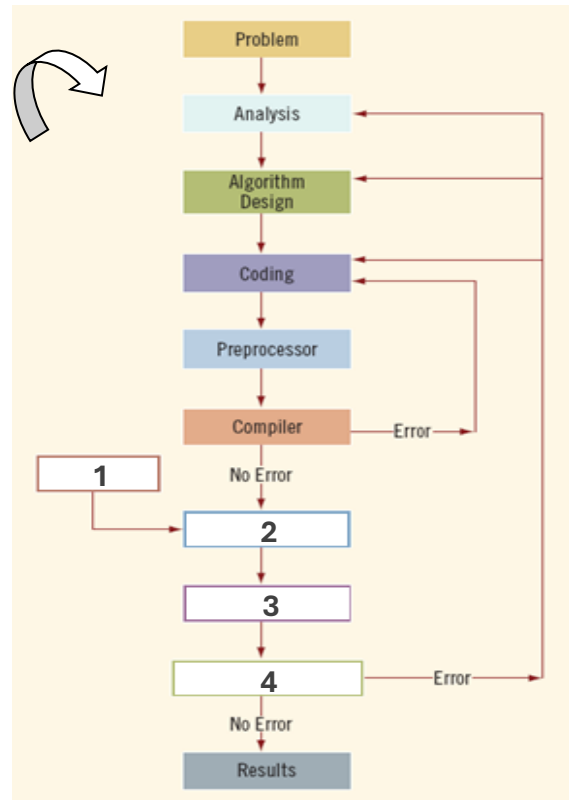
    return 0;
}
```



Question 5:

- i. Given the following diagram for the Problem Analysis–Coding–Execution Cycle, complete the following lines to show the details of the machine-role in that cycle:

1.
2.
3.
4.

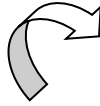


Question 6: Given the following program, show the corresponding output on the screen:

```
#include <iostream>
using namespace std;
int main()
{
    int x=13, y = 24, z=5;
    double w=3.0;

    z = x--;
    w = x/z+y;
    cout << "Value of Z is: " << z << endl ;
    cout << "Value of W is: " << w << endl ;
    if (z>5)
        cout << "Last Value of Z is: " << --z << endl ;

    return 0;
}
```



Question 7: C++ Coding

1 Simple Sum

Write a C++ program that asks the user to enter two numbers, then displays their **sum**.

2 Average of Three Numbers

Write a program that reads **three numbers** from the user and calculates their **average**.

Hint: $\text{average} = (\text{num1} + \text{num2} + \text{num3}) / 3$

3 Rectangle Area

Write a program that asks the user to enter the **length** and **width** of a rectangle, then prints the **area**.

Hint: $\text{area} = \text{length} * \text{width}$

4 Convert Temperature

Write a program that reads a temperature in **Celsius** and converts it to **Fahrenheit** using the formula:

$$F = (C * 9 / 5) + 32$$

5 Simple Expression

Write a program to evaluate and display the result of this expression:

$$(3 + 5 * 2 + 8 / 3) - 7 / 2$$

Hint: use integer division for $/$.

Question 8: Compound Assignment Operators

Given the following program, show the output on the screen

```
#include <iostream>
using namespace std;
int main()
{
    int x = 4, y = 3;
    x *= y;    // line 1
    cout << "After line 1, x = " << x << endl;
    x += 2;    // line 2
    cout << "After line 2, x = " << x << endl;
    x %= 5;    // line 3
    cout << "After line 3, x = " << x << endl;
    return 0;
}
```



Question 9: Increment and Decrement Operators

Given the following program, trace the values of each variable after every line.

```
#include <iostream>

using namespace std;

int main()
{
    int x = 5, y, z;

    y = ++x;          // line 1: pre-increment
    z = x + y;        // line 2
    y = x++;          // line 3: post-increment
    z = x + y;        // line 4
    y = --x;          // line 5: pre-decrement
    z = x + y;        // line 6
    y = x--;          // line 7: post-decrement
    z = x + y;        // line 8
    cout << "x = " << x << endl;
    cout << "y = " << y << endl;
    cout << "z = " << z << endl;
    return 0;
}
```

Fill in the table with the values of each variable after every line.

Line	Statement	x	y	z
Start	int x = 5, y, z;	5	–	–
1	y = ++x;			–
2	z = x + y;			
3	y = x++;			
4	z = x + y;			
5	y = --x;			
6	z = x + y;			
7	y = x--;			
8	z = x + y;			