

Assignment - 01(CPP)

1. Write a C++ program that prints "Hello, World!" to the console.

```
first.cpp > ...
1  #include <iostream>
2  using namespace std;
3  int main() {
4      cout << "Hello, World!" << endl;
5      return 0;
6  }
7

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS
● PS D:\CDAC Hyderabad\C Program\C++> .\first
Hello, World!
○ PS D:\CDAC Hyderabad\C Program\C++> █
```

2. Write a C++ program that takes two integer inputs from the user and prints their sum.

C++ sec.cpp > ...

```
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      int num1, num2, sum;
6
7      cout << "Enter first number: ";
8      cin >> num1;
9
10     cout << "Enter second number: ";
11     cin >> num2;
12
13     sum = num1 + num2;
14
15     cout << "The sum is: " << sum << endl;
16
17     return 0;
18 }
19
```

```
PS D:\CDAC Hyderabad\C Program\C++> .\sec
Enter first number: 34
Enter second number: 55
The sum is: 89
PS D:\CDAC Hyderabad\C Program\C++>
```

Java: Ready

3. Write a C++ program to swap two numbers without using a third variable.

```
third.cpp > main()
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      int a, b;
6      cout << "Enter two numbers: ";
7      cin >> a >> b;
8
9      a = a + b;
10     b = a - b;
11     a = a - b;
12
13     cout << "After swapping: a = " << a << ", b = " << b << endl;
14     return 0;
15 }
16
```

```
PS D:\CDAC Hyderabad\C Program\C++> ./third
Enter two numbers: 4
6
After swapping: a = 6, b = 4
PS D:\CDAC Hyderabad\C Program\C++>
```

4. Write a C++ program that checks whether a number entered by the user is even or odd.

```
Welcome first.cpp PHP: 1.61 sec.cpp third.cpp fourth.cpp X
fourth.cpp > main()
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      int n;
6      cout << "Enter a number: ";
7      cin >> n;
8
9      if (n % 2 == 0)
10         cout << n << " is Even" << endl;
11     else
12         cout << n << " is Odd" << endl;
13
14     return 0;
15 }
```

```
PS D:\CDAC Hyderabad\C Program\C++> ./fourth
Enter a number: 67
67 is Odd
PS D:\CDAC Hyderabad\C Program\C++> ./fourth
Enter a number: 88
88 is Even
PS D:\CDAC Hyderabad\C Program\C++>
```

5. Write a C++ program that takes two numbers and an operator (+, -, *, /) as input and performs the corresponding operation.

```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     double a, b;
6     char op;
7     cout << "Enter two numbers: ";
8     cin >> a >> b;
9     cout << "Enter operator (+, -, *, /): ";
10    cin >> op;
11
12    switch (op) {
13        case '+': cout << "Result = " << a + b << endl; break;
14        case '-': cout << "Result = " << a - b << endl; break;
15        case '*': cout << "Result = " << a * b << endl; break;
16        case '/':
17            if (b != 0) cout << "Result = " << a / b << endl;
18            else cout << "Error! Division by zero." << endl;
19            break;
20        default: cout << "Invalid operator!" << endl;
21    }
22    return 0;
23 }
```

```
PS D:\CDAC Hyderabad\C Program\C++> ./fifth
Enter two numbers: 4
4
Enter operator (+, -, *, /): *
Result = 16
PS D:\CDAC Hyderabad\C Program\C++> ./fifth
Enter two numbers: 32
3
Enter operator (+, -, *, /): /
Result = 10.6667
PS D:\CDAC Hyderabad\C Program\C++> ./fifth
Enter two numbers: 34
34
Enter operator (+, -, *, /): +
Result = 68
PS D:\CDAC Hyderabad\C Program\C++>
```

6. Write a C++ program that takes n numbers as input, stores them in an array, and finds the largest number.

```
C++ sixth.cpp > main()
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      int n;
6      cout << "Enter number of elements: ";
7      cin >> n;
8
9      int arr[n];
10     cout << "Enter " << n << " numbers: ";
11     for (int i = 0; i < n; i++) cin >> arr[i];
12
13     int largest = arr[0];
14     for (int i = 1; i < n; i++)
15         if (arr[i] > largest) largest = arr[i];
16
17     cout << "Largest number = " << largest << endl;
18     return 0;
19 }
20
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
● PS D:\CDAC Hyderabad\C Program\C++> ./sixth
Enter number of elements: 5
Enter 5 numbers: 7
5
9
3
5
Largest number = 9
○ PS D:\CDAC Hyderabad\C Program\C++>
```

7. Write a C++ program that takes an integer input and calculates the sum of its digits.

```
sebenth.cpp > main()
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      int n, sum = 0;
6      cout << "Enter an integer: ";
7      cin >> n;
8
9      while (n > 0) {
10         sum += n % 10;
11         n /= 10;
12     }
13
14     cout << "Sum of digits = " << sum << endl;
15     return 0;
16 }
17
```



```
Enter an integer: 456
Sum of digits = 15
PS D:\CDAC Hyderabad\C Program\C++>
```

8. Write a C++ program to take n elements in an array and print them in reverse order.

```

eight.cpp > main()
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      int n;
6      cout << "Enter number of elements: ";
7      cin >> n;
8
9      int arr[n];
10     cout << "Enter " << n << " numbers: ";
11     for (int i = 0; i < n; i++) cin >> arr[i];
12
13     cout << "Array in reverse: ";
14     for (int i = n - 1; i >= 0; i--) cout << arr[i] << " ";
15     cout << endl;
16
17     return 0;
18 }
19

```

```

PS D:\CDAC Hyderabad\C Program\C++> ./eight
Enter number of elements: 5
Enter 5 numbers: 4
45
55
88
5
Array in reverse: 5 88 55 45 4
PS D:\CDAC Hyderabad\C Program\C++>

```


9. Write a C++ program to check if a given number is palindromic (reads the same forward and backward).

```
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      int n, rev = 0, temp;
6      cout << "Enter a number: ";
7      cin >> n;
8      temp = n;
9
10     while (temp > 0) {
11         rev = rev * 10 + temp % 10;
12         temp /= 10;
13     }
14
15     if (n == rev) cout << n << " is Palindrome" << endl;
16     else cout << n << " is Not Palindrome" << endl;
17
18     return 0;
19 }
```

```
● PS D:\CDAC Hyderabad\C Program\C++> ./nineth
Enter a number: 55555
55555 is Palindrome
● PS D:\CDAC Hyderabad\C Program\C++> ./nineth
Enter a number: 4584
4584 is Not Palindrome
○ PS D:\CDAC Hyderabad\C Program\C++> 
```

10. Write a C++ program to print the Fibonacci series up to n terms.

```

C++ tenth.cpp > ...
1  #include <iostream>
2  using namespace std;
3
4
5  int main() {
6      int n, a = 0, b = 1, c;
7      cout << "Enter number of terms: ";
8      cin >> n;
9
10     cout << "Fibonacci Series: ";
11     for (int i = 1; i <= n; i++) {
12         cout << a << " ";
13         c = a + b;
14         a = b;
15         b = c;
16     }
17     cout << endl;
18     return 0;
19 }
20

```

```

PS D:\CDAC Hyderabad\C Program\C++> ./tenth
Enter number of terms: 10
Fibonacci Series: 0 1 1 2 3 5 8 13 21 34
PS D:\CDAC Hyderabad\C Program\C++>

```

11. Write a C++ program that takes a string as input and counts the number of vowels (a, e, i, o, u).

```

1  #include <iostream>
2  #include <string>
3  using namespace std;
4
5  int main() {
6      string str;
7      cout << "Enter a string: ";
8      getline(cin, str);
9
10     int count = 0;
11     for (char ch : str) {
12         ch = tolower(ch);
13         if (ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u')
14             count++;
15     }
16
17     cout << "Number of vowels = " << count << endl;
18     return 0;
19 }
20

```

```

PS D:\CDAC Hyderabad\C Program\C++> ./eleth
Enter a string: hello
Number of vowels = 2
PS D:\CDAC Hyderabad\C Program\C++>

```

12. Write a C++ program to find the GCD of two numbers

```

C> tweth.cpp > ...
1  #include <iostream>
2  using namespace std;
3
4  int gcd(int a, int b) {
5      while (b != 0) {
6          int temp = b;
7          b = a % b;
8          a = temp;
9      }
10     return a;
11 }
12
13 int main() {
14     int x, y;
15     cout << "Enter two numbers: ";
16     cin >> x >> y;
17     cout << "GCD = " << gcd(x, y) << endl;
18     return 0;
19 }
20

```

```

NUMBER OF VOWELS = 2
PS D:\CDAC Hyderabad\C Program\C++> ./tweth
Enter two numbers:
55
44
GCD = 11
PS D:\CDAC Hyderabad\C Program\C++>

```

13. Write a C++ program to multiply two matrices.

```

C++ ththenth.cpp > ...
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      int r1, c1, r2, c2;
6      cout << "Enter rows and cols of first matrix: ";
7      cin >> r1 >> c1;
8      cout << "Enter rows and cols of second matrix: ";
9      cin >> r2 >> c2;
10
11     if (c1 != r2) {
12         cout << "Matrix multiplication not possible!" << endl;
13         return 0;
14     }
15
16     int A[r1][c1], B[r2][c2], C[r1][c2];
17
18     cout << "Enter first matrix:\n";
19     for (int i=0; i<r1; i++)
20         for (int j=0; j<c1; j++)
21             cin >> A[i][j];
22
23     cout << "Enter second matrix:\n";
24     for (int i=0; i<r2; i++)
25         for (int j=0; j<c2; j++)
26             cin >> B[i][j];
27
28     for (int i=0; i<r1; i++)
29         for (int j=0; j<c2; j++) {
30             C[i][j] = 0;
31             for (int k=0; k<c1; k++)
32                 C[i][j] += A[i][k]*B[k][j];
33         }
34
35     cout << "Result matrix:\n";
36     for (int i=0; i<r1; i++) {
37         for (int j=0; j<c2; j++)
38             cout << C[i][j] << " ";
39         cout << endl;
40     }
41
42     return 0;
43 }
44

```

● PS D:\CDAC Hyderabad\C Program\C++> ./ththenth

Enter rows and cols of first matrix: 2

2

Enter rows and cols of second matrix: 2

2

Enter first matrix:

23

67

88

66

Enter second matrix:

54

4

5

6

Result matrix:

1577 494

5082 748

○ PS D:\CDAC Hyderabad\C Program\C++> █

14. A number is an Armstrong number if the sum of its digits raised to the power of the number of digits is equal to the number itself (e.g., $153 = 1^3 + 5^3 + 3^3$). Write a C++ program to check if a number is Armstrong.

```
1  #include <iostream>
2  #include <cmath>
3  using namespace std;
4
5  int main() {
6      int n, temp, digits = 0, sum = 0;
7      cout << "Enter a number: ";
8      cin >> n;
9      temp = n;
10
11     while (temp > 0) {
12         digits++;
13         temp /= 10;
14     }
15
16     temp = n;
17     while (temp > 0) {
18         int d = temp % 10;
19         sum += pow(d, digits);
20         temp /= 10;
21     }
22
23     if (sum == n) cout << n << " is an Armstrong number" << endl;
24     else cout << n << " is not an Armstrong number" << endl;
25
26     return 0;
27 }
28
```

```
PS D:\CDAC Hyderabad\C Program\C++> ./forthenth
Enter a number: 54
54 is not an Armstrong number
PS D:\CDAC Hyderabad\C Program\C++> ./forthenth
Enter a number: 153
153 is not an Armstrong number
PS D:\CDAC Hyderabad\C Program\C++>
```

15. Write a C++ program to print Pascal's triangle up to n rows.

```
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      int n;
6      cout << "Enter number of rows: ";
7      cin >> n;
8
9      for (int i=0;i<n;i++) {
10         int num = 1;
11         for (int j=0;j<=i;j++) {
12             cout << num << " ";
13             num = num * (i - j) / (j + 1);
14         }
15         cout << endl;
16     }
17
18     return 0;
19 }
20
```

```
PS D:\CDAC Hyderabad\C Program\C++> ./fifthrnth
Enter number of rows: 3
1
1 1
1 2 1
PS D:\CDAC Hyderabad\C Program\C++> ./fifthrnth
Enter number of rows: 5
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
PS D:\CDAC Hyderabad\C Program\C++>
```