ASSIGNMENT – 1

- Nimit Agarwal (E22CSEU0423)

Ques 1. Write a C++ program to print a string
Sample Test Case Sample Output:
This is my first C++ Program

Ans.

```
#include <iostream>
using namespace std;
int main() {
    cout << "This is my first C++ Program" << endl;
    return 0;
}
```

Ques 2. Write a C++ program to print a string without using 'namespace std'
Sample Test Case Sample Output:
This is my first C++ Program

Ans.

```
#include <iostream>
int main() {
    std::cout << "This is my first C++ Program" << std::endl;
    return 0;
}
```

Ques 3. Write a C++ program to print the size of int, char, float and double type variables Sample Test Case Sample Output:
4

1

4

8

Ans.

```
#include <iostream>
int main() {
    std::cout << sizeof(int) << std::endl;
    std::cout << sizeof(char) << std::endl;
    std::cout << sizeof(float) << std::endl;
    std::cout << sizeof(double) << std::endl;
    return 0;
}
```

Ques 4. Write a C++ program to find the minimum price among three options for a product. Input prices using user-defined input to discover the most affordable choice, helping you make the best decision while shopping.

Sample Test Case Sample Input:

Enter the price of Smartphone 1: $600

Enter the price of Smartphone 2: $550

Enter the price of Smartphone 3: $580

Sample Output:

The best deal in Smartphone is $550.

Ans.

```
#include <iostream>

int main() {
    double price1, price2, price3;
    std::cout << "Enter the price of Smartphone 1: $";
```

```
    std::cin >> price1;
    std::cout << "Enter the price of Smartphone 2: $";
    std::cin >> price2;
    std::cout << "Enter the price of Smartphone 3: $";
    std::cin >> price3;
    double minPrice = (price1 < price2) ? ((price1 < price3) ? price1 :
price3) : ((price2 < price3) ? price2 : price3);
    std::cout << "The best deal in Smartphone is $" << minPrice << "." <<
std::endl;
    return 0;
}
```

Ques 5. Write a C++ program where you take a sentence as an input from the user and output each word of a sentence in a separate line Sample Test Case Sample Input:
This is a program to get the idea of control statements Sample Output:
This is a program to get the idea of control statements.

Ans5.

```
#include <iostream>
#include <string>
#include <stream>
int main() {
    std::string sentence;

    std::cout << "Enter a sentence: ";

    std::getline(std::cin, sentence);

    std::istringstream iss(sentence);

    std::string word;
```

```
    while (iss >> word) {
        std::cout << word << std::endl;
    }
    return 0;
}
```

Ques 6. Write a C++ program to find a sum of first n natural numbers (where n is defined by user)
Sample Test Case Sample Input:
Enter a positive number:5 Sample Output:
Sum = 15
Explanation
Sum of first 5 natural numbers is 1+2+3+4+5

Ans 6.

```
#include <iostream>
int main() {
    int n;
    int sum = 0;
    std::cout << "Enter a positive number: ";
    std::cin >> n;
    for (int i = 1; i <= n; ++i) {
        sum += i ;
    }
    std::cout << "Sum = " << sum << std::endl;
    return 0;
}
```

Ques 7. Understand how computers store and process data in binary format for efficient computation and data storage. Write a C++ program that converts a decimal number to its binary representation using loops.
Sample Test Case
Enter a decimal number: 13
Binary representation: 1101

Ans 7.

```
#include <iostream>
#include <vector>
int main() {
    int decimalNumber;
    std::vector<int> binaryDigits;
    std::cout << "Enter a decimal number: ";
    std::cin >> decimalNumber;
    while (decimalNumber > 0) {
        binaryDigits.push_back(decimalNumber % 2);
        decimalNumber /= 2;
     }

    std::cout << "Binary representation: ";
    for (int i = binaryDigits.size() - 1; i >= 0; --i) {
        std::cout << binaryDigits[i];
    }
    std::cout << std::endl;
    return 0;
}
```

Ques 8. Implement a C++ program to calculate Investment Growth with Compound Interest:
You want to invest a certain amount ('a') in a long-term account with a fixed interest rate ('r'). Write a program to calculate the investment's

value over 'n' years and print the growth at each interval. This will help you plan your financial future wisely.

Sample Test Case

Enter the starting investment (a): 5000
Enter the common ratio (r): 1.1
Enter the number of years (n): 5

Investment Growth Over Time (GP with common ratio 1.1):
Year 1: $5000
Year 2: $5500
Year 3: $6050
Year 4: $6655
Year 5: $7320.5

Ans .

```
#include <iostream>
#include <iomanip>
int main() {
    double principal;
    double rate;
    int years;
    std::cout << "Enter the starting investment (a): ";
    std::cin >> principal;
    std::cout << "Enter the common ratio (r): ";
    std::cin >> rate;
    std::cout << "Enter the number of years (n): ";
    std::cin >> years;
    std::cout << "Investment Growth Over Time (GP with common ratio "
<< rate << "):" << std::endl;
    for (int i = 1; i <= years; ++i) {
        double investment = principal * std::pow(rate, i);
```

```
        std::cout << "Year " << i << ": $" << std::fixed << std::setprecision(2)
<< investment << std::endl;
    }
    return 0;
}
```

Ques 9. Implement a C++ program to find the greatest common divisor (GCD) of two given positive integers 'a' and 'b' using the Euclidean algorithm with a loop.
Sample Test Case
Enter two positive integers 'a' and 'b': 24 18
GCD of 24 and 18 is: 6

Ans .

```
#include <iostream>
int main() {
    int a, b;
    std::cout << "Enter two positive integers 'a' and 'b': ";
    std::cin >> a >> b;
    if (b > a) {
        int temp = a;
        a = b;
        b = temp;
    }
    while (b != 0) {
        int remainder = a % b;
        a = b;
        b = remainder;
    }
    std::cout << "GCD of " << a << " and " << b << " is: " << a << std::endl;
```

```
    return 0;
}
```

Ques 10. Create a C++ program for a personal health tracker. Input weight and height to calculate your Body Mass Index (BMI).
Sample Test Case
Enter your weight in kilograms: 70
Enter your height in meters: 1.645
You are overweight.

Ans .

```
#include <iostream>
int main() {
    double weight, height;
    std::cout << "Enter your weight in kilograms: ";
    std::cin >> weight;
    std::cout << "Enter your height in meters: ";
    std::cin >> height;
    bmi = weight / (height * height);
    if (bmi < 18.5) {
        std::cout << "You are underweight." << std::endl;
    }
    else if (bmi >= 18.5 && bmi < 25.0) {
        std::cout << "Your weight is normal." << std::endl;
    }
    else if (bmi >= 25.0 && bmi < 30.0) {
        std::cout << "You are overweight." << std::endl;
    }
    else {
        std::cout << "You are obese." << std::endl;
    }
    return 0;
}
```