(PRACTICE QUESTION)

Q:1) Declare all data types (int, double, float, long int) and print their values in a specific format.

```
# include<iostream>
using namespace std;
int main () {
    int integer = 10;
    float Float = 3.14;
    double Double = 3.14159;
    long int Long-Integer = 15926431L;
    cout << "Integer : " << integer << endl;
    cout << " Float number" << ~~float~~ Float << endl;
    cout << " Double number" << Double << endl;
    cout " long int " << Long-Integer << endl;
    return 0;
}
```

Q.2) Compare two numbers using the ternary operator.

```
#include <iostream>
using namespace std;
int main () {
    int num1, num2;
    cout << "Enter two numbers " << end);
    cin >> num1 >> num2;
    int larger = (num1 > num2) ? num1 : num2;
    cout << " The larger number is " << larger << endl;
    return 0;
```

3) Convert Celsius to Fahrenheit:

```
#include <iostream>
using namespace std;
int main(){
    float C, F;
    cout << "Enter temperature in Celsius:";
    cin >> C;
    F = (C * 9/5) + 32;
    cout << "Temperature in Fahrenheit" << F << endl;
    return 0;
}
```

4.) Check if year is leap or not:

```
#include <iostream>
using namespace std;
int main(){
    int year;
    cout << "Enter a year" << endl.
    cin >> year;
    if((year % y == 0 && year % 100 != 0) || (year % 400 == 0)) {
        cout << year << " is a leap year." << endl;
    } else {
        cout << year << " is not a leap year" << endl;
    }
    return 0;
}
```

5.) If number is even or not:

```
#include <iostream>
using namespace std;
int main (){
    int num;
    cout << "Enter a number" <<endl;
    cin >> num;
    if( num % 2 == 0) cout<< "It is an even number" <<endl;
    else cout<< "It is an odd number" <<endl;
    return 0;
}
```

6.) Calculate %age and grade based on input of 5 subjects,

```
#include <iostream>
using namespace std;
int main (){
    // I can use array for subjects but it is basic question
    int float m1, m2, m3, m4, m5; total = 0, percentage;
    char grade;
    cout<< "Enter marks of 5 subjects" <<endl;
    cin >> m1, >> m2 >> m3 >> m4 >> m5;

    total += m1 + m2 + m3 + m4 + m5;
    Percentage = (total * 100)/5;
    if (percentage > 80) grade = 'A';
    else if( percentage >= 65) grade = 'B';
    else if (percentage >= 50) grade = 'C';
    else grade = 'F';
cout << "Obtained marks" << total <<endl;
cout<< "Percentage :" << percentage << "%" <<endl;
cout<< "Grade :" << grade <<endl;
return 0;
}
```

7

7) Multiplication table of a number:

```
#include<iostream>
using namespace std;
int main () {
    int num;
    cout << " Enter a number to generate its table" << endl;
    cin >> num;
    cout << " Multiplication table of " << num << ":" << endl;
    for (int i=1; i<=10; i++)
        cout << num << "*" << i << " = " << num*i << endl;
    return 0;
}
```

8.) Area based on user input : Circle (enter 11) Rectangle (enter 22) Square (33) Triangle (44)

```
#include<iostream>
#include<cmath>
using namespace std;
int main () {
    int choice;
    float area;
    cout << Enter 11 for circle, 22 for rectangle, 33 for square, 44 for triangle" << endl
    switch (choice) {
        case 11: {
            float ~~radius~~ r;
            cin >> ~~radius~~ r;
            area = M_PI * r*r;
            cout << " Circle area " << area << endl;
        break;
        }
        case 22: {
            float w,l;
            cin >> w >> l;
            area = l * w;
            cout << Area of rectangle is " << area << endl;
        break;
```

```
Case 44: {
        float base, height;
        cin>> base >> height ;
        area = 0.5 * base *height ;
        cout << "Area of triangle :" << area <<endl;
    } Case 33: {
            float side ;
            cin >> side ;
            cout << "Area of square :" <<area <<endl;
        break;
    } default :  cout << " Invalid choice" <<endl;
                 break;
    }
    return 0;
}
```

9.) Use of goto statement

```
#include <iostream>
using namespace std;
int main () {
    int num;
    cout << "Enter any number except 0 . Press 0 to stop" <<endl;
    ~~cin >> num;~~
    start :
    cin >> num ;
    if (num != 0) {
        cout << "Enter number except 0" <<endl;
        goto start ;
    }
    cout << "Program ends" <<endl;
} return 0;
```

10.) Check if No. is prime

```
#include <iostream >
using namespace std;
int main () {
    int num, count = 0;
    cout << "Enter a number" << endl;
    cin >> num;
    if (num <= 1) {
        cout << num << " is not a prime number" << endl;
        return 0;
    }
    for (int i = 2 ; i <= num/2 ; i++) {
        if (num % i == 0) {
            count = 1;
            break;
        }
    }
    if (count == 0) cout << "It is a prime number" << endl;
    else cout << "It is not a prime number" << endl;
    return 0;
}
```

11.) Check if a number is Armstrong

```
#include < iostream >
#include < cmath>
using namespace std;
int main () {
    int num, temp, rem, res = 0, n = 0;
    cout << "Enter a number:";
    cin >> num;
    temp = num;
    while (temp != 0) {
        temp /= 10;
        n ++;
    }
```

```
temp = num;
while (temp != 0) {
        rem = temp % 10;
        res += pow(rem, n);
        temp /= 10;
}
if (res == num) cout << num << " is an Armstrong number" << endl;
else cout << num << " is not an Armstrong number." << endl;
return 0;
}
```

123.) Pattern

```
*
* *
* * *
* * * *
```

```
#include <iostream>
using namespace std;
int main () {
    int a;
    cin >> a;
    for (int i = 1; i <= a; i++){
        for (int j = 1; j <= i ; j++){
            cout << " * ";
        }
    cout << endl;
    }
    return 0;
}
```

13.)

```
1
2  3
4  5  6
7  8  9  10
```

```
#include <iostream>
using namespace std;
int main (){
    int a, n=1;
    cin >>a;
    for (int i=1; i<= a ;i++) {
        for (int j=1;j<=i ,j++) {
            cout << n <<" ";
            num ++;
        }
        cout <<endl;
    }
    return 0;
}
```

14.) Swap two numbers using call by reference

```
#include<iostream>
using namespace std;
void swap (int &a ,int &b) {
    int temp = a;
        a = b;
        b = temp;

}

int main (){
    int x, y;
    cin >> x >>y;
    swap (x, y) ;
    cout << x <<" "<< y << endl;
    return 0;
}
```

15.) Demonstrate command line arguments.

```
#include <iostream>
using namespace std;
int main(int argc, char* argv[]) {
    cout << "Number of arguments:" << argc << endl;
    cout << "Arguments passed:" << endl;
    for (int i = 0; i<argc ; i++) cout << argv[i] << endl;
    return 0;
}
```

16.) Differentiate Global and local variable

```
#include <iostream>
using namespace std;
int globalVar = 100;
void display () {
    int localVal = 10;
    cout << " Local value inside function" << localVal << endl;
    cout << "Global value inside function" << globalVar << endl;
}
int main () {
    cout << "Global variable in main :" << globalVar << endl;
    display ();
    return 0;
}
```

17.) Area of circle and rectangular using function return types

```
#include <iostream>
using namespace std;
float Circle (float r) {
    return 3.1415 * r * r;
}
float rectangle ( float length , float width ) {
    return length * width ;
}
```

```
int main () {
    float r, length, width;
    cout << " Radius ? ";
    cin >> r;
    cout << " Area of circle: " << ~~area~~ Circle (r) << endl;
    cout << length and width, " << endl;
    cin >> length >> width;
    cout << " Area of rectangle: " << rectangle (length, width) << endl;
    return 0;
}
```

18.) Sum and Avg

```
#include <iostream>
using namespace std;
int main () {
    int num[10], sum = 0;
    cout << " Enter 10 numbers " << endl;
    for (int i = 0; i < 10; i++) {
        cin >> num[i];
        sum += num[i];
    }
    float avg = sum / 10.0;
    cout << " Sum: " << sum << endl;
    cout << " Avg: " << avg << endl;
    return 0;
}
```

19.) Calculate power using recursion :-

```
#include <iostream>
using namespace std;
int power (int base, int exp) {
        if (exp == 0) return 1;
        return base * power (base, exp-1);
}
```

```
int main(){
    int base, exp;
    cout<< "Enter base and exponent"<<endl;
    cin>> base >> exp;
    cout<< base << "raised to power" << exp << "is" << power(base, exp);
    return 0;
}
```

20.) Take input of 10 elements, store and display them using a 1-D array and function.

```
#include<iostream>
using namespace, std;
int main() { //
void input (int arr[], int size){
    cout<< "Enter " << size <<"elements";
    for (int i=0; i< size ; i++){
        cin >> arr [i];
    }
}
void display (int arr[], int size){
    cout << "The elements are :";
    for (int i=0; i<size ; i++) {
        cout<< arr [i] <<" ";
    }
    cout << endl;
}
int main() {
    int arr [10];
    input( arr , 10);
    display (arr ,10) ;
    return 0;
}
```

22) Multiplication of two matrices.

```
#include<iostream>
using namespace std;
int main () {
    int x[2][2], y[2][2], z[2][2] = {0};
    cout<<"Enter element of 1st matrix";
    for (int i=0; i<2; i++) {
        for (int j=0; j<2; j++) {
            cin >> x[i][j];
        }
    }
    cout<<"Enter elements of 2nd Matrix";
    for (int i=0; i<2; i++) {
        for (int j=0; j<2; j++) {
            cin>>y[i][j];
        }
    }
    for (int i=0; i<2; i++)
        for (int j=0; j<2; j++)
            for (int k=0; k<2; k++)
                z[i][j] += x[j][j] * y[i][j];
    cout<< "Product of matrix is". <<endl;
    for (int i=0; i<2; i++)
        for (int j=0; j<2; j++)
            cout << product[i][j]<<" ";
            cout <<endl;
    return 0;
}
```

23.) Print length of string without using library function

```
#include<iostream>
using namespace std;
int string (const char str[]) {
    int length = 0;
    while (str[length] != '\0') length++;
    return length;
}
int main () {
    char str[100];
    cout << "Enter a string"<<endl;
    cin.getline (str, 100);
    cout << "String : " << str<<endl;
    cout << " length" << string (str) <<endl;
    return 0;
}
```

24.) Sum of array elements using pointers and functions.

```
#include<iostream>
using namespace std;
~~int main () {~~
int sum( int* arr , int size) {
    int sum = 0;
    for (int i = 0; i < size ; i++) {
        sum += *(arr + i);
    }
    return sum;
}
int main () {
    int arr [5];
    cout<<"Enter 5 elements";
    for (int i = 0; i<5 ; i++) cin>>arr[i];
    cout << "Sum of elements:" << sum (arr, 5)<< endl;
    return 0;
}
```

25.) Sum of two numbers using pointers.

```
#include <iostream>
using namespace std;
~~int main () {~~
void Sum (int * a , int * b , int * result) {
        *result = *a + *b;
    }
int main () {
        int num1, num2 , result;
        cout << "Enter two numbers: ";
        cin >> num1 >> num2;
        Sum (&num1 &num2, & result);
        cout <<"Sum:" << result << endl;
        return 0;
}
```

26.) Create a text file, write Contents using fwrite, and read them using fread.

```
#include <iostream>
#include <cstdio>
using namespace std;
struct Data {
        char name[50];
        int age
int main() {
        File* file;
        char name [50];
        int age;
        file = fopen("data.bin", "wb");
        if (file == NULL) {
            cout <<"Error opening file for writing!" <<endl;
            return 1;
```

~~cout <<~~ int main() { //continued

```
        cout << "Enter your name:" ;
        cin.ignore();
        cin.getline (name, 50);
        cout << "Enter your age:" ;
        cin >> age;
    fwrite(name, sizeof(char), 50, file);
    fwrite(&age, sizeof(int), 1, file);
    fclose(file);
    file = fopen("data.bin", "rb")
    if (file == NULL){
        cout << "Error opening file for reading" << endl;
    } return 1;

    char read[50]
    int readage;

    fread(readName, sizeof(char), 50, file);
    fread(&readage, sizeof(int), 1, file);
    cout << "\n Reading from file: \n" ;
    cout << "Name: " << readName << "\n Age" << readAge << endl;

    fclose(file)
    return 0;
}
```