Experiment 1

Difference between C and C++ programs

Q 1) WAP that uses an uninitialized constant integer and then prints its value compile and run the program in C and C++ Separately and see the differences. State the reason for the same.

Program in C:-

```c
#include<stdio.h>
int main(){
    const int x;
    printf("%d\n",x);
}
```

```
PROBLEMS  DEBUG CONSOLE  TERMINAL
TERMINAL                                                    1: bash
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$ gcc Question1.c -o 1
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$ ./1
0
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$
```

Program in C++

```c
#include<stdio.h>
int main(){
    const int x;
    printf("%d\n",x);
}
```

```
PROBLEMS  DEBUG CONSOLE  TERMINAL
TERMINAL                                                    1: bash
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$ g++ Question1.cpp -o 1
Question1.cpp: In function 'int main()':
Question1.cpp:3:15: error: uninitialized const 'x' [-fpermissive]
    3 |     const int x;
      |               ^
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$
```

Explanation:
In C constant integer if uninitialized it will automatically store 0 in it, but in C++ it will show an error when we compile it that it is uninitialized.

Q 2) A program uses generic pointer and tries to assign the value stored at this generic pointer to an integer/character pointer. After that print the address stored at these two pointers in hexadecimal format . Compile the program using C and C++ compiler and run. Note the differences while

compiling and find the reason.

Program in C:-

```c
#include<stdio.h>
int main(){
    int num=5;
    int *ptr;
    void *g;
    ptr=&num;
    printf("Value of num is %d\n",num);
    printf("The address of the integer pointer is %x \n",ptr);
    printf("The address of the generic pointer is %x \n",g);
}
```

```
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TERMINAL

shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$ ./1
Value of num is 5
The address of the integer pointer is 95761424
The address of the generic pointer is 95761530
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$
```

Program in C++:-

```cpp
#include<iostream>
using namespace std;
int main(){
    int num=5;
    int *ptr;
    void *g;
    ptr=&num;
    cout<<"Value of num is "<<num;
    cout<<"\nThe address of the integer pointer is "<<ptr;
    cout<<"\nThe address of the generic pointer is "<<g;
    cout<<"\n";
    }
```

```
PROBLEMS  DEBUG CONSOLE  TERMINAL

TERMINAL

shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$ g++ Question2.cpp -o 1
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$ ./1
Value of num is 5
The address of the integer pointer is 0x7fff1dc7f2d4
The address of the generic pointer is 0x7fff1dc7f3e0
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$
```

Explanation:

In the C programming language we need to use “%x” specifier to print in the hexadecimal form whereas in C++ the address is automatically allocated in hexadecimal format.

Q 4) Wap to find the distance between two points in a plane using structures

```cpp
#include <iostream>
#include <cmath>
using namespace std;
struct point
{
    float x1, y1, z1, x2, y2, z2;
    void coordinate()
    {
        cout << "Enter the coordinate of the two point :\n";
        cout << "Enter the coordinate of point A\n";
        cin >> x1 >> y1 >> z1;
        cout << "Enter the coordinate of point B\n";
        cin >> x2 >> y2 >> z2;
    }
};
typedef struct point point;
int main(){
    float x;
    point d;
    d.coordinate();
    cout << "The distance between two point of the plane is :";
    x = sqrt(fabs((d.x2 - d.x1) * (d.x2 - d.x1)) +  fabs((d.y2 - d.y1) * (d.y2 - d.y1)) +
    cout << x << "\n";
}
```

```
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$ g++ 4.cpp -o 1
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$ ./1
Enter the coordinate of the two point :
Enter the coordinate of point A
4
3
2
Enter the coordinate of point B
5
6
7
The distance between two point of the plane is :5.91608
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$
```

Q 5) Create a structure point and write a function and find out the area of a triangle formed by such three point

```cpp
#include <iostream>
#include<cmath>
using namespace std;
struct point{
    float x1, y1, x2, y2, x3, y3;
    void coordinate(){
        cout << "Enter the coordinate of the two point :\n";
        cout << "Enter the coordinate of point A\n";
        cin >> x1 >> y1;
        cout << "Enter the coordinate of point B\n";
        cin >> x2 >> y2;
        cout << "Enter the coordinate of point C\n";
        cin >> x3 >> y3;
    }
};
typedef struct point point;
int main(){
    float x;
    point d;
    d.coordinate();
    cout << "The area of triangle is :";
    x = fabs((d.x1 * (d.y2 - d.y3) + d.x2 * (d.y3 - d.y1) + d.x3 * (d.y1 - d.y3)) / 2);
    cout << x << "\n";
}
```

```
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$ ./1
Enter the coordinate of the two point :
Enter the coordinate of point A
1
2
Enter the coordinate of point B
3
4
Enter the coordinate of point C
5
6
The area of triangle is :5
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$
```

Q 6) WAP to create structure length with member data feet and inches. Find the sum of length.

```
1  #include<iostream>
2  using namespace std;
3  struct length{
4      int f1,f2,i1,i2;
5      void input(){
6  cout<<"Enter the length in feet and inches\n";
7  cout<<"Enter the first length in feet and inches\n";
8  cin>>f1>>i1;
9  cout<<"Enter the second length in feet and inches\n";
10 cin>>f2>>i2;
11 }};
12 int main(){
13     float a,b;
14     length len;
15     len.input();
16     a=len.f1+len.f2;
17     b=len.i1+len.i2;
18     if(b>=12){b=b-12;a=a+1;}
19     cout<<"The sum of both the length is : "<<a<<" feet "<<b<<" inches\n";
20     }
```

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TERMINAL

```
Enter the length in feet and inches
Enter the first length in feet and inches
12
4
Enter the second length in feet and inches
5
3
The sum of both the length is : 17 feet 7 inches
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory0/Question$
```

Submitted By :- Shyam Tiwari
Signature :-
Date:-