

Data Structure Lab

المرحلة الاولى / قسم هندسة الحاسوب

اعداد

المدرس المساعد . هبة اكرم علي

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Q// C++ program to add two integers. Make a function add() to add integers and display sum in main() function.

```
#include <iostream.h>
// Function prototype (declaration)
int add(int, int);
int main()
{
    int num1, num2, sum;
    cout<<"Enters two numbers to add: ";
    cin >> num1 >> num2;

    // Function call
    sum = add(num1, num2);
    cout << "Sum = " << sum;
    return 0;
}
// Function definition
int add(int a, int b)
{
    int add;
    add = a + b;
    // Return statement
    return add;
}
```

Enters two integers: 8

-4

Sum = 4

Function Overloading

```
#include <iostream.h>
void display(int);
void display(float);
void display(int, float);
int main() {
    int a = 5;
    float b = 5.5;
    display(a);
    display(b);
    display(a, b);
    return 0;
}
void display(int var) {
    cout << "Integer number: " << var << endl;
}
void display(float var) {
    cout << "Float number: " << var << endl;
}
void display(int var1, float var2) {
    cout << "Integer number: " << var1;
    cout << " and float number:" << var2;
}
```

```
Integer number: 5      Float number: 5.5
Integer number: 5 and float number: 5.5
```

Example \ Function Overloading

```
// Program to compute absolute value
// Works both for integer and float
#include <iostream.h>
int absolute(int);
float absolute(float);
int main() {
    int a = -5;
    float b = 5.5;

    cout << "Absolute value of " << a << " = " << absolute(a) << endl;
    cout << "Absolute value of " << b << " = " << absolute(b);
    return 0;
}
int absolute(int var) {
    if (var < 0)
        var = -var;
    return var;
}
float absolute(float var){
    if (var < 0.0)
        var = -var;
    return var;
}
```

Absolute value of -5 = 5

Absolute value of 5.5 = 5.5

Example \ Global variable

```
#include <iostream.h>
// Global variable declaration
int c = 12;
void test();
int main()
{
    ++c;

    // Outputs 13
    cout << c <<endl;
    test();

    return 0;
}

void test()
{
    ++c;

    // Outputs 14
    cout << c;
}
```

Output

13

14

Example \ Static local variable

```
#include <iostream.h>
void test()
{
    // var is a static variable
    static int var = 0;
    ++var;
    cout << var << endl;
}
int main()
{
    test();
    test();

    return 0;
}
```

Output

```
1
2
```

Example \\ Factorial of a Number Using Recursion

```
// Factorial of n = 1*2*3*...*n
#include <iostream.h>
int factorial(int);
int main()
{
    int n;
    cout<<"Enter a number to find factorial: ";
    cin >> n;
    cout << "Factorial of " << n <<" = " << factorial(n);
    return 0;
}

int factorial(int n)
{
    if (n > 1)
    {
        return n*factorial(n-1);
    }
    else
    {
        return 1;
    }
}
```

Q// C++ program to add two integers. Make a function `sum()` to add integers and display sum in `main()` function.

```
#include <iostream.h>
int sum(int a, int b=20) {
    int result;

    result = a + b;

    return (result);
}

int main () {
    // local variable declaration:
    int a = 100;
    int b = 200;
    int result;

    // calling a function to add the values.
    result = sum(a, b);
    cout << "Total value is :" << result << endl;

    // calling a function again as follows.
    result = sum(a);
    cout << "Total value is :" << result << endl;

    return 0;
}
```

```
Total value is: 300
Total value is: 120
```