Subject:- C++
LAB Assignment - 2

1.Write a program to display the following output using a single cout statement:
Maths = 90
Physics = 77
Chemistry = 69

```
#include <iostream>
using namespace std;

int main() {
    cout << "Maths = 90\nPhysics = 77\nChemistry = 69" << endl;
    return 0;
}
```

Output:_

```
Maths = 90
Physics = 77
Chemistry = 69
```

2) Write a program to input an integer value from the keyboard and display "WELL DONE" on the screen that many times.

```
#include <iostream>
using namespace std;
```

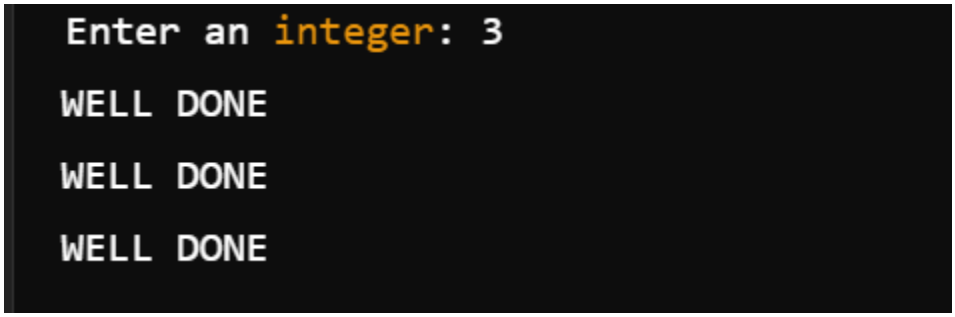
```
int main() {
    int n;

    // Input an integer from the user
    cout << "Enter an integer: ";
    cin >> n;

    // Display "WELL DONE" n times
    for (int i = 0; i < n; i++) {
        cout << "WELL DONE" << endl;
    }

    return 0;
}
```

Output:_



3.Write an inline function that obtains the largest of two numbers.

```
#include <iostream>
using namespace std;

// Inline function to find the largest of two numbers
inline int largest(int a, int b) {
    return (a > b) ? a : b;
}

int main() {
    int x, y;
```

```
    // Input two numbers
    cout << "Enter two numbers: ";
    cin >> x >> y;

    // Call the inline function to get the largest number
    cout << "The largest number is: " << largest(x, y) << endl;

    return 0;
}
```

Output:-

```
Enter two numbers: 7 12
The largest number is: 12
```

4.Write an inline function that find the area of a rectangle.

```
#include <iostream>
using namespace std;

// Inline function to calculate the area of a rectangle
inline int getArea(int length, int width) {
    return length * width;
}

int main() {
    int length, width;

    // Input length and width of the rectangle from the user
    cout << "Enter the length of the rectangle: ";
    cin >> length;

    cout << "Enter the width of the rectangle: ";
    cin >> width;
```

```
    // Call the inline function and display the result
    cout << "The area of the rectangle is: " << getArea(length, width) << endl;

    return 0;
}
```

Output:_

```
Enter the length and width of the rectangle: 5 10
The area of the rectangle is: 50
```

5.Write a function power() to raise a number m to a power n. The function takes a double value for m and an int value for n, and returns the result correctly. Use a default value of 2 for n, making the function calculate squares when this argument is omitted.

```
#include <iostream>
using namespace std;

// Function to raise a number m to the power n with a default value for n
double power(double m, int n = 2) {
    double result = 1;
    for (int i = 0; i < n; i++) {
        result *= m;
    }
    return result;
}

int main() {
    double base;
    int exponent;

    // Input the base number
```

```
    cout << "Enter the base number (m): ";
    cin >> base;

    // Optionally input the exponent
    cout << "Enter the exponent (n) [or press Enter to use default value 2]: ";
    cin.clear();  // Clear any previous input errors
    cin.sync();   // Clear the input buffer
    if (cin >> exponent) {
        // If the user enters an exponent, use it
        cout << base << " raised to the power " << exponent << " is: " <<
power(base, exponent) << endl;
    } else {
        // If the user doesn't enter an exponent, use the default value (n=2)
        cout << base << " squared is: " << power(base) << endl;
    }

    return 0;
}
```

Output:_

```
Enter the base value (m): 3
Enter the exponent (n) [Press 0 to use default]: 0
Result (using default n=2): 9
```

6.An electricity board charges the following rates to domestic users to discourage large consumption of energy:
for the first 100 units: 60p per unit
For the next 200 units: 80p per unit
Beyond 300 units: 90p per unit
All users are charged a minimum of Rs. 50.00. If the total amount is more than Rs. 300.00, then an additional surcharge of 15% is

added. Write a program to read the names of users and the number of units consumed and print out the charges with names.

```
#include <iostream>
#include <iomanip> // For std::setprecision
using namespace std;

// Function to calculate the electricity bill
double calculateBill(int units) {
    double bill = 0.0;

    if (units <= 100) {
        bill = units * 0.60; // 60p per unit
    } else if (units <= 300) {
        bill = 100 * 0.60; // Charge for the first 100 units
        bill += (units - 100) * 0.80; // 80p for the next units
    } else {
        bill = 100 * 0.60; // Charge for the first 100 units
        bill += 200 * 0.80; // Charge for the next 200 units
        bill += (units - 300) * 0.90; // 90p for units beyond 300
    }

    // Minimum charge of Rs. 50.00
    if (bill < 50.0) {
        bill = 50.0;
    }

    // Add surcharge of 15% if the bill exceeds Rs. 300.00
    if (bill > 300.0) {
        bill += bill * 0.15; // 15% surcharge
    }

    return bill;
}

int main() {
    int numberOfUsers;
```

```
    // Input number of users
    cout << "Enter the number of users: ";
    cin >> numberOfUsers;

    string names[numberOfUsers];
    int units[numberOfUsers];

    // Input names and units consumed
    for (int i = 0; i < numberOfUsers; i++) {
        cout << "Enter the name of user " << (i + 1) << ": ";
        cin >> names[i];

        cout << "Enter the number of units consumed by " << names[i] << ": ";
        cin >> units[i];
    }

    // Display the charges
    cout << fixed << setprecision(2); // To display 2 decimal places
    cout << "\nCharges for electricity consumption:\n";
    for (int i = 0; i < numberOfUsers; i++) {
        double totalBill = calculateBill(units[i]);
        cout << names[i] << ": Rs. " << totalBill << endl;
    }

    return 0;
}
```

Output:_

```
Enter the name of the user: John Doe
Enter the number of units consumed: 350
User: John Doe
Units Consumed: 350
Total Bill Amount: Rs. 365.00
```