

C++ Programming Lab Manual

Example : swap x and y using third variable

```
#include <iostream>
using namespace std;
int main() {
    double x, y, temp;
    cout << "x= ";
    cin >> x;
    cout << "y= ";
    cin >> y;
    temp = x;
    x = y;
    y = temp;
    cout << "-----\n";
    cout << "x = " << x << "\ny = " << y << endl;
    return 0;
}
```

Example : swap x and y without using third variable

```
#include <iostream>
using namespace std;
int main()
{
    double x,y;
    cout << "x= ";
    cin >> x;
    cout << "y= ";
    cin >> y;
    x = x + y;
    y = x - y;
    x = x - y;
    cout << "-----\n";
    cout << "x = " << x << "\ny = " << y << endl;
    return 0;
}
```

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Example : C++ Program to Check Whether Number is Even or Odd

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

int main()
{
    int n;

    cout << "Enter an integer: ";
    cin >> n;

    if ( n % 2 == 0)
        cout << n << " is even.";
    else
        cout << n << " is odd.";

    return 0;
}
```

Example: C++ Program to Find All Roots of a Quadratic Equation

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$D = b^2 - 4ac$$

If determinant > 0,	$root1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$
	$root2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$
If determinant = 0,	$root1 = root2 = \frac{-b}{2a}$
If determinant < 0,	$root1 = \frac{-b}{2a} + i \frac{\sqrt{-(b^2 - 4ac)}}{2a}$
	$root2 = \frac{-b}{2a} - i \frac{\sqrt{-(b^2 - 4ac)}}{2a}$

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

int main() {

    float a, b, c, x1, x2, D;
    cout << "Enter coefficients a, b and c: ";
    cin >> a >> b >> c;
    D = b * b - 4 * a * c;

    if (D > 0) {
        x1 = (-b + sqrt(D)) / (2 * a); //sqrt() library function is used to find the square root of a number
        x2 = (-b - sqrt(D)) / (2 * a);
        cout << "Roots are real and different." << endl;
    }
```

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```
    cout << "x1 = " << x1 << endl;
    cout << "x2 = " << x2 << endl;
}

else if (D == 0) {
    cout << "Roots are real and same." << endl;
    x1 = (-b + sqrt(D)) / (2 * a);
    cout << "x1 = x2 =" << x1 << endl;
}

else {

    cout << "Roots are complex and different." << endl;
}

return 0;
}
```

Example: Find maximum value of two variables

```
#include <iostream>
using namespace std;
int main() {
    cout << "Insert two numbers to find the maximum one\n";
    cout << "-----\n";
    double FNum, SNum;
    cout << "First Number= ";
    cin >> FNum;
    cout << "Second Number= ";
    cin >> SNum;
    cout << "-----\n";
    if (FNum > SNum)
        cout << "First Number= " << FNum << " Is the maximum Number\n";
    else if (FNum < SNum) cout << "Second Number= " << SNum << " Is the maximum
Number\n";
    else cout << "First Number = Second Number";
    return 0;
}
```

Example: C++ Program to Find Largest Number Among Three Numbers

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

int main()
{
    float n1, n2, n3;

    cout << "Enter three numbers: ";
    cin >> n1 >> n2 >> n3;
    if ((n1 >= n2) && (n1 >= n3))
        cout << "Largest number: " << n1;
    else if ((n2 >= n1) && (n2 >= n3))
        cout << "Largest number: " << n2;
    else
        cout << "Largest number: " << n3;

    return 0;
}
```

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Example: C++ Program to read the numbers from 1 to 7 and display their correspondence day of week using if statement.

```
#include <iostream>
using namespace std;
int main()
{
    int Day_Number;
    cin >> Day_Number;
    if (Day_Number == 1) {
        cout << "sunday";
    }
    else if(Day_Number == 2){
        cout << "monday";
    }
    else if (Day_Number == 3) {
        cout << "Tuesday";
    }
    else if (Day_Number == 4) {
        cout << "wednesday";
    }
    else if (Day_Number == 5) {
        cout << "thursday";
    }
    else if (Day_Number == 6) {
        cout << "fridaay";
    }
    else if (Day_Number == 7) {
        cout << "saturday";
    }
    else{
        cout << "error";
    }
    return 0;
}
```

Example: C++ Program to read the numbers from 1 to 7 and display their correspondence day of week using case statement.

```
#include <iostream>
using namespace std;
int main()
{
    int Day_Number;
    cout << "inter the number of day";
    cin>> Day_Number;
    switch (Day_Number) {
    case 1:cout << "sunday";
        break;
    case 2: cout << "monday";
        break;
    case 3: cout << "Tuesday";
        break;
    case 4: cout << "wednesday";
        break;
    case 5: cout << "thursday";
        break;
    case 6: cout << "fridaay";
        break;
    case 7: cout << "saturday";
        break;
    default: cout << "error";
    }
}
```

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Example: C++ Program to read student's mark as integer then print the equivalent grade depends on the following table:

$0 \leq \text{Mark} < 60$	$60 \leq \text{Mark} < 65$	$65 \leq \text{Mark} < 75$	$75 \leq \text{Mark} < 85$	$85 \leq \text{Mark} < 100$
Fail	OK	Good	Very Good	Excellent

Example: C++ Program to:

- a) Read an employee name (NAME), overtime hours worked (OVERTIME), hours absent (ABSENT)
- b) Determine the bonus payment (PAYMENT).

Bonus Schedule	
OVERTIME – (2/3)*ABSENT	Bonus Paid
>40 hours	\$50
>30 but \leq 40 hours	\$40
>20 but \leq 30 hours	\$30
>10 but \leq 20 hours	\$20
\leq 10 hours	\$10