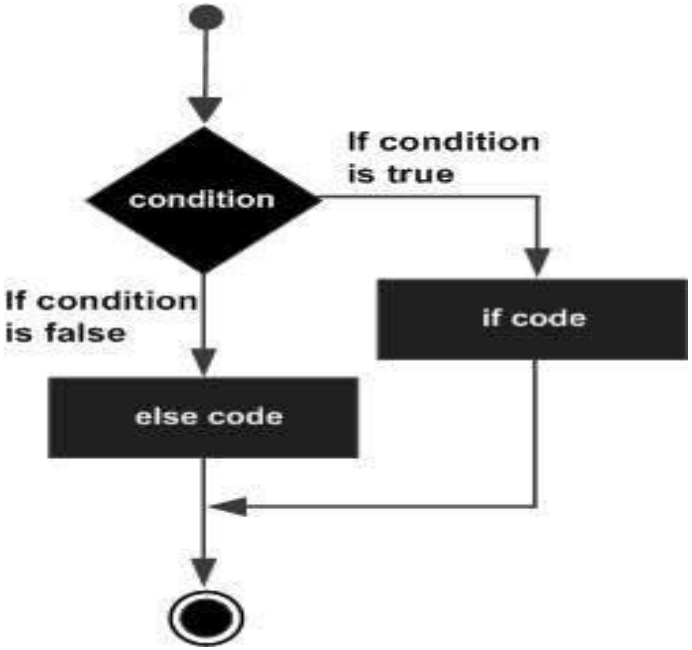
Introduction to Computers
Lab 10
First Year (2017– 2018)

Welcome To C++!!

if...else Statement



C++ Syntax

- If (condition) {
- // statement(s) will execute if the condition is true
- } else {
- // statement(s) will execute if the condition is false
- }

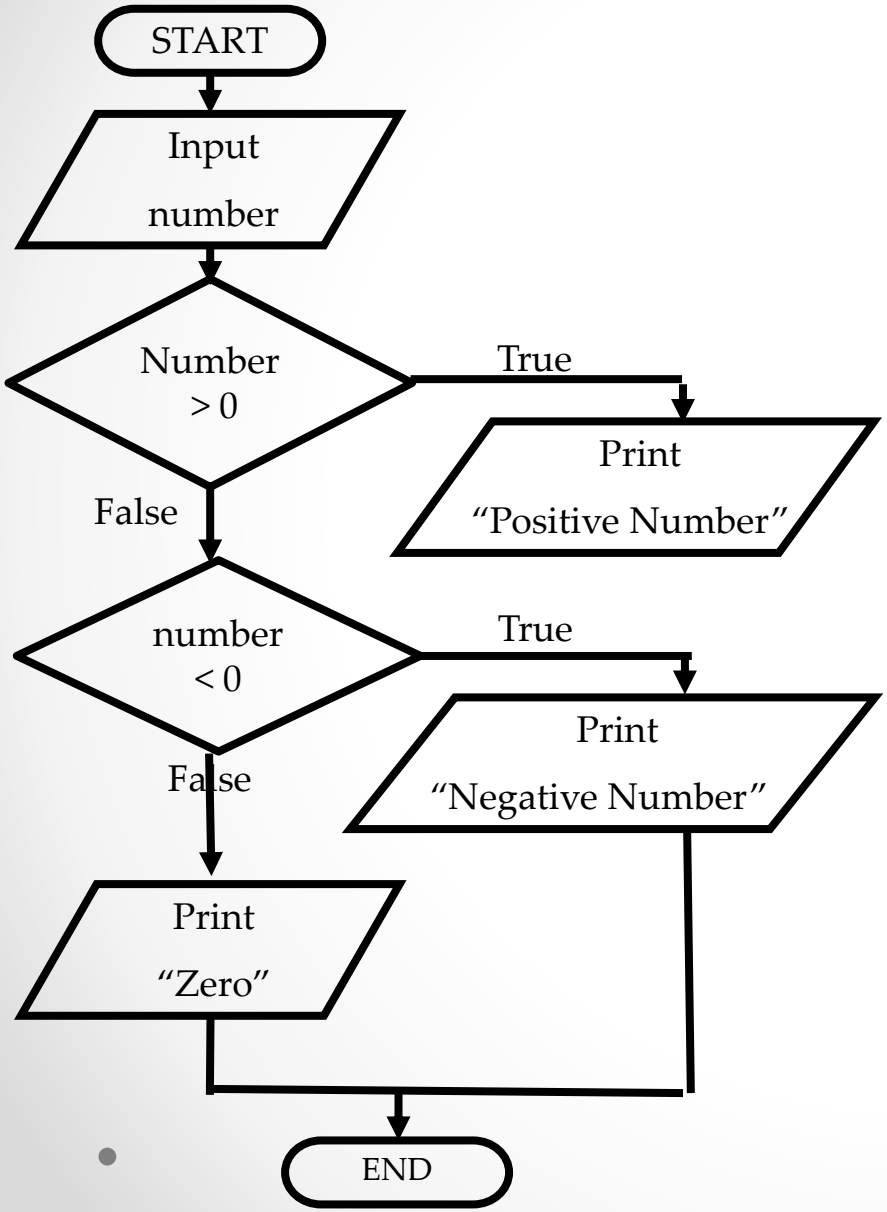
Operators used in conditions

>	**greater than**
<	**less than**
=	**equal to**
>=	**greater than or equal to**
<=	**less than or equal to**
< >	**not equal to**

Exercise 1

- Write a program that reads a number and determines whether it is positive, negative or zero.

Exercise 1(cont.)



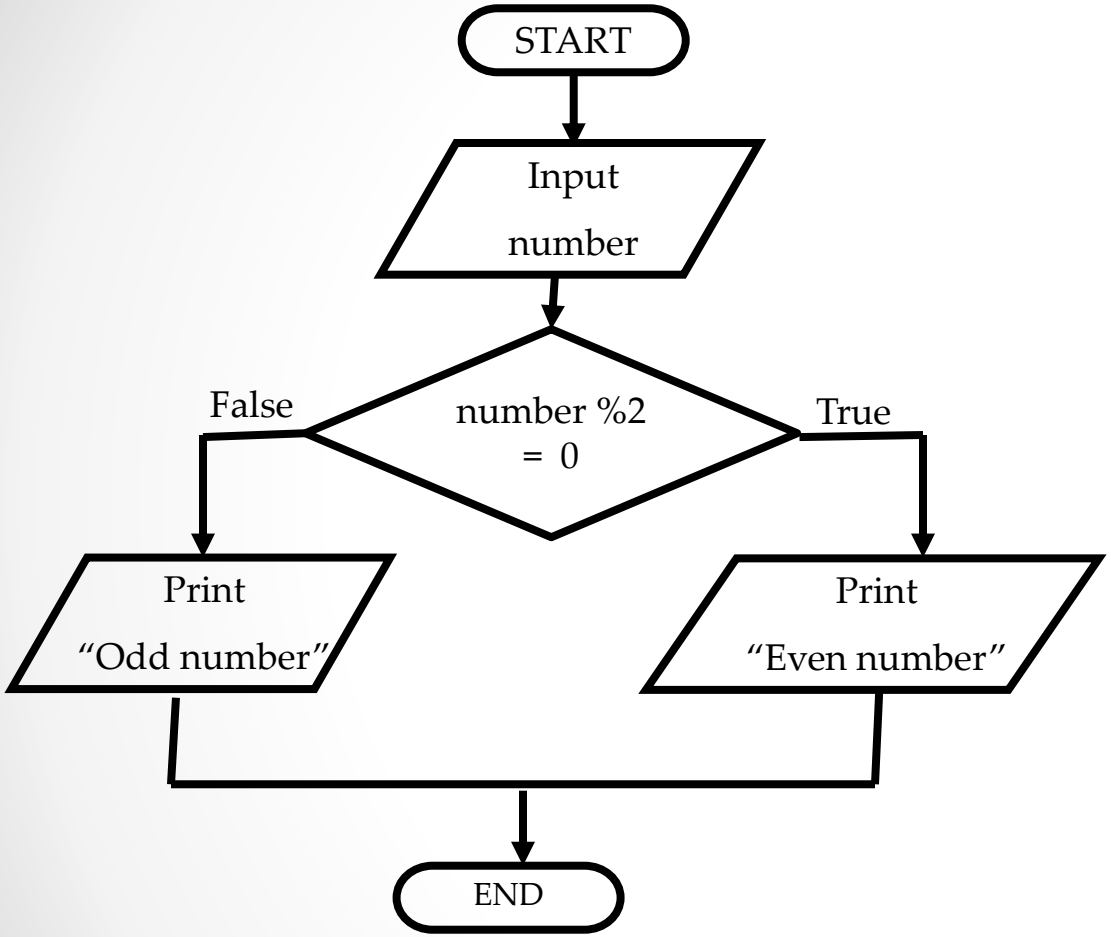
Exercise 1: Solution

```
#include<iostream>
using namespace std;
int main()
{
    int number;
    cout<<"Please enter number: ";
    cin>> number;
    if (number > 0)
        cout<< "Number is positive\n";
    else if(number == 0)
        cout<< "Number is zero\n";
    else
        cout<< "Number is Negative\n";
    return 0;
}
```

Exercise 2

- Write a program that reads a number and determines whether it is even or odd.

Exercise 2 (cont.)



Exercise 2: Solution

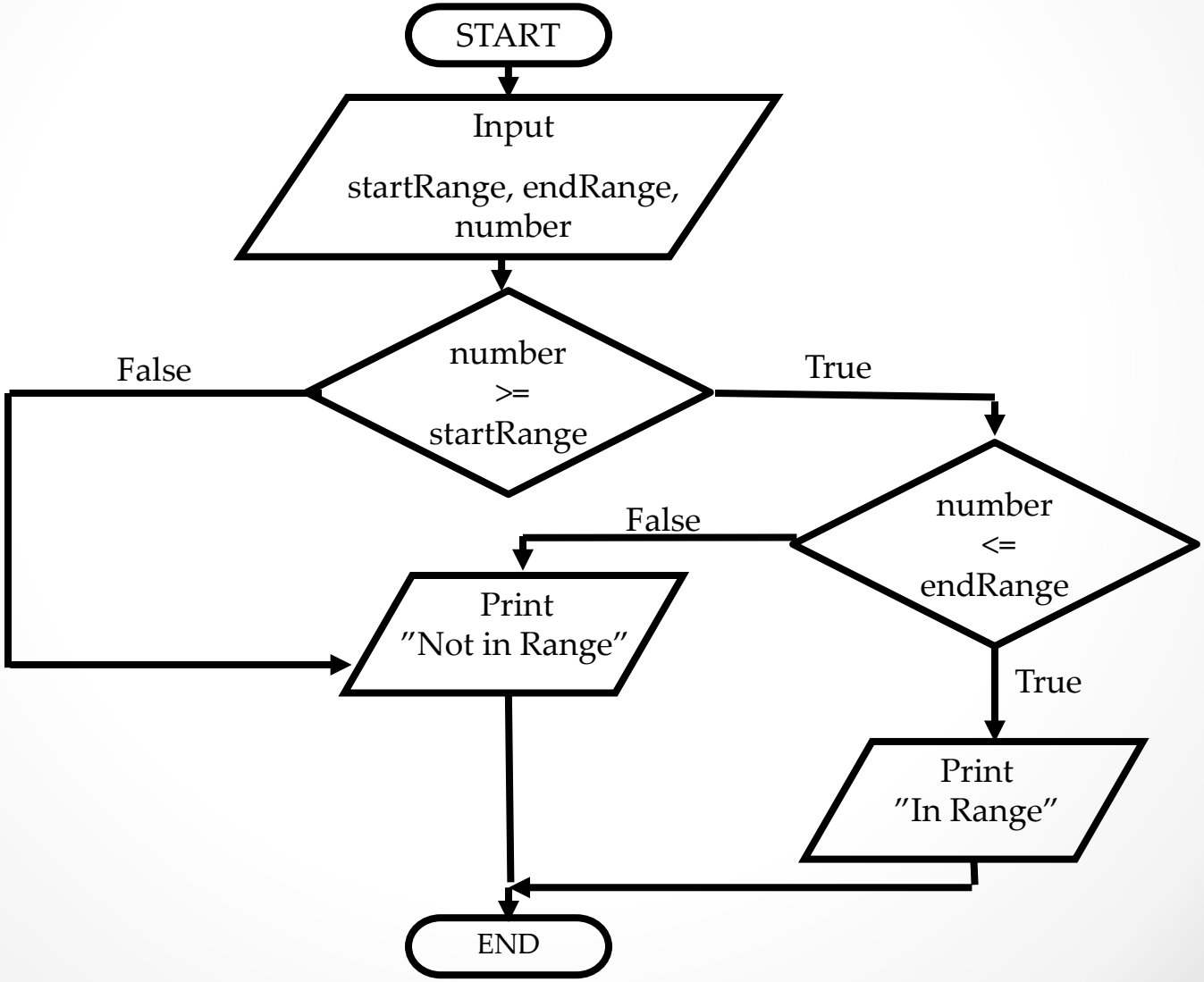
```
#include<iostream>
using namespace std;
int main()
{
    int number ;
    cout<<"Please enter number: ";
    cin>> number;
    if (number%2 == 0)
        cout<< "Number is even\n";
    else
        cout<< "Number is odd\n";
    return 0;
}
```

Exercise 3

- Write a program that checks whether an input number lies between specified range.
- For example: If user enters range (20, 50) and queried number 34, the program should display “In range”. On the other hand, if he enters 76, the program should display “Not in Range”.

Exercise 3 (cont.)

- Using nested IF structure



Exercise 3: Solution

```
#include<iostream>
using namespace std;
int main()
{
     int start,end,number;
     cout<<"Please enter range: ";
     cin>> start >> end;
     cout<<"Please enter number: ";
     cin>> number;
     if (number >= start )
     {
          if (number <= end)
              cout<<"In range\n";
          else
              cout<<"Not in range\n";
     }
     else
          cout<<"Not in range\n";
     return 0;
}
```

Exercise 3: Another Solution

```
#include<iostream>
using namespace std;
int main()
{
    int s, e, number;
    cout<<"Please enter range: ";
    cin>> s >> e;
    cout<<"Please enter number: ";
    cin>> number;
    if(number>= s && number <= e)
        cout<<"In range\n";
    else
        cout<<"Not in range\n";
    return 0;
}
```

C++ Conditional ? : Operator

```
if(y < 10) {
   var = 30;
} else {
   var = 40;
}
```

```
var = (y < 10) ? 30 : 40;
```

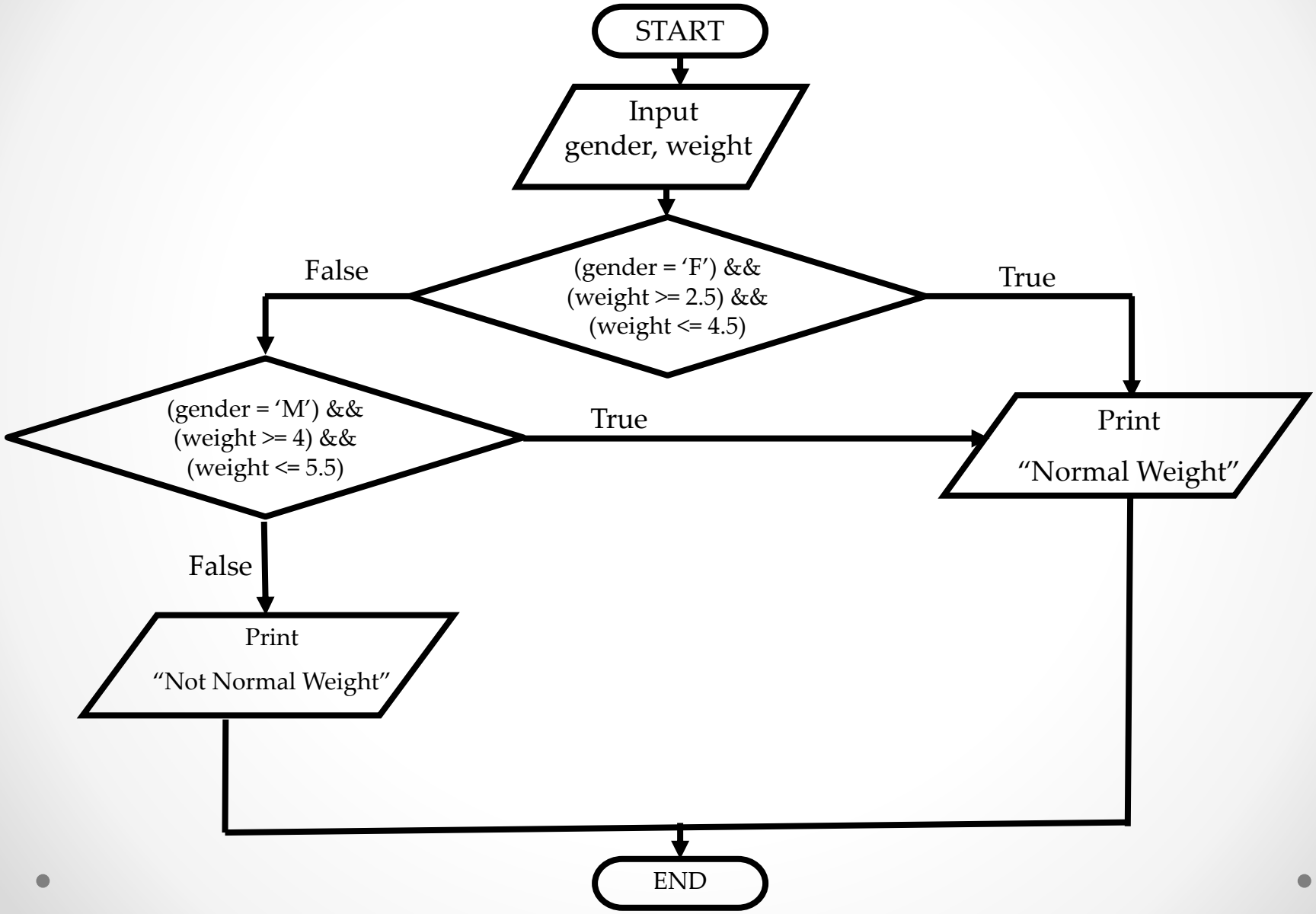
if...else if...else Statement

- if(Condition 1) {
- // Executes when the condition1 is true
- } else if(Condition 2) {
- // Executes when the Condition 2 is true
- } else if(Condition 3) {
- // Executes when the Condition 3 is true
- } else {
- // executes when the none of the above condition is true.
- }

Exercise 4

- Write a program that determines whether a baby's weight is normal or not. For girls, normal babies weight are 2.5 to 4.5 KG. On the other hand, for boys the normal weights are 4 to 5.5 KG.

Exercise 4 flow chart



Exercise 4: Solution

```
#include<iostream>
using namespace std;
int main()
{
    char gender;
    float weight;
    cout<<"Please enter gender(m | F): ";
    cin>> gender;
    cout<<"Please enter weight : ";
    cin>> weight;
    if ((gender == 'F'|| gender == 'f') && weight >=2.5 && weight <=4.5)
        cout<<"Normal\n";
    else if((gender == 'M'|| gender == 'm') && weight >=4 && weight <=5.5)
        cout<<"Normal\n";
    else
        cout <<“Not normal \n";
    return 0;
}
```

Switch Case

```
switch(expression) {
   case constant-expression  :
      statement(s);
      break; //optional
   case constant-expression  :
      statement(s);
      break; //optional
   // you can have any number of case statements.
   default : //Optional
      statement(s);
}
```

Switch case (cont.)

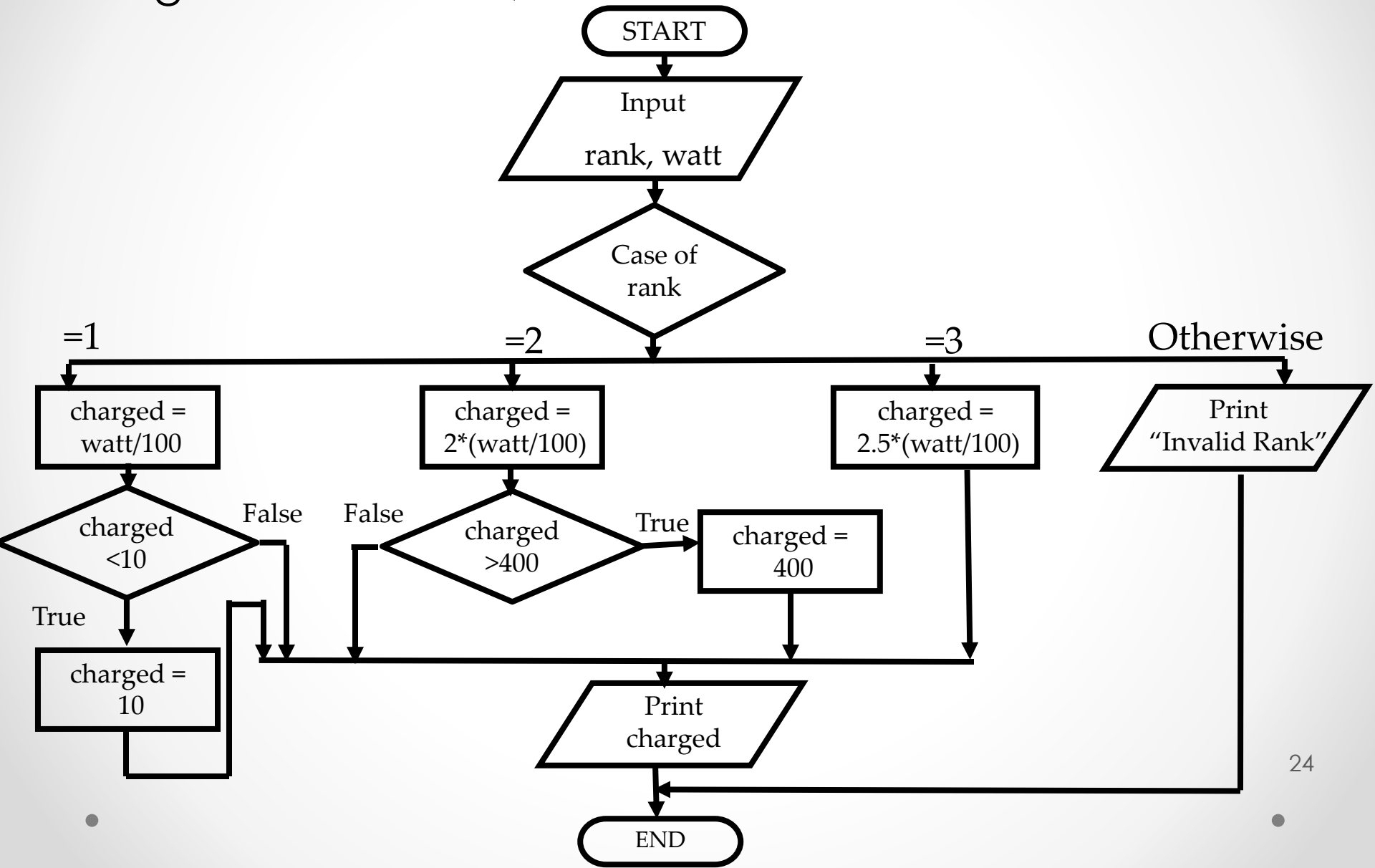
- The following rules apply to a switch statement:
- The **expression** used in a **switch** statement must have an integral or enumerated type.
- You can have any number of case statements within a switch. Each case is followed by the value to be compared to and a colon.
- The **constant-expression** for a case must be the same data type as the variable in the switch.
- When the variable being switched on is equal to a case, the statements following that case will execute until a **break** statement is reached.
- A **switch** statement can have an optional **default** case, which must appear at the end of the switch. The default case can be used for performing a task when none of the cases is true. No break is needed in the default case.

Exercise 5

- Write an algorithm for electricity company, which charges customers according to their usage rank (1,2 or 3) and reading (watt).
  - In rank 1, customers pay 1 L.E./100 watt with minimum 10 L.E.
  - In rank 2, customers pay 2 L.E./100 watt, but pay at maximum 400 L.E.
  - In rank 3, customers pay 2.5 L.E./100 watt.
- Program reads the usage rank and reading and displays the charged amount.

Exercise 5(cont.)

- Using case structure, with embedded IF statements



Exercise 5: Solution

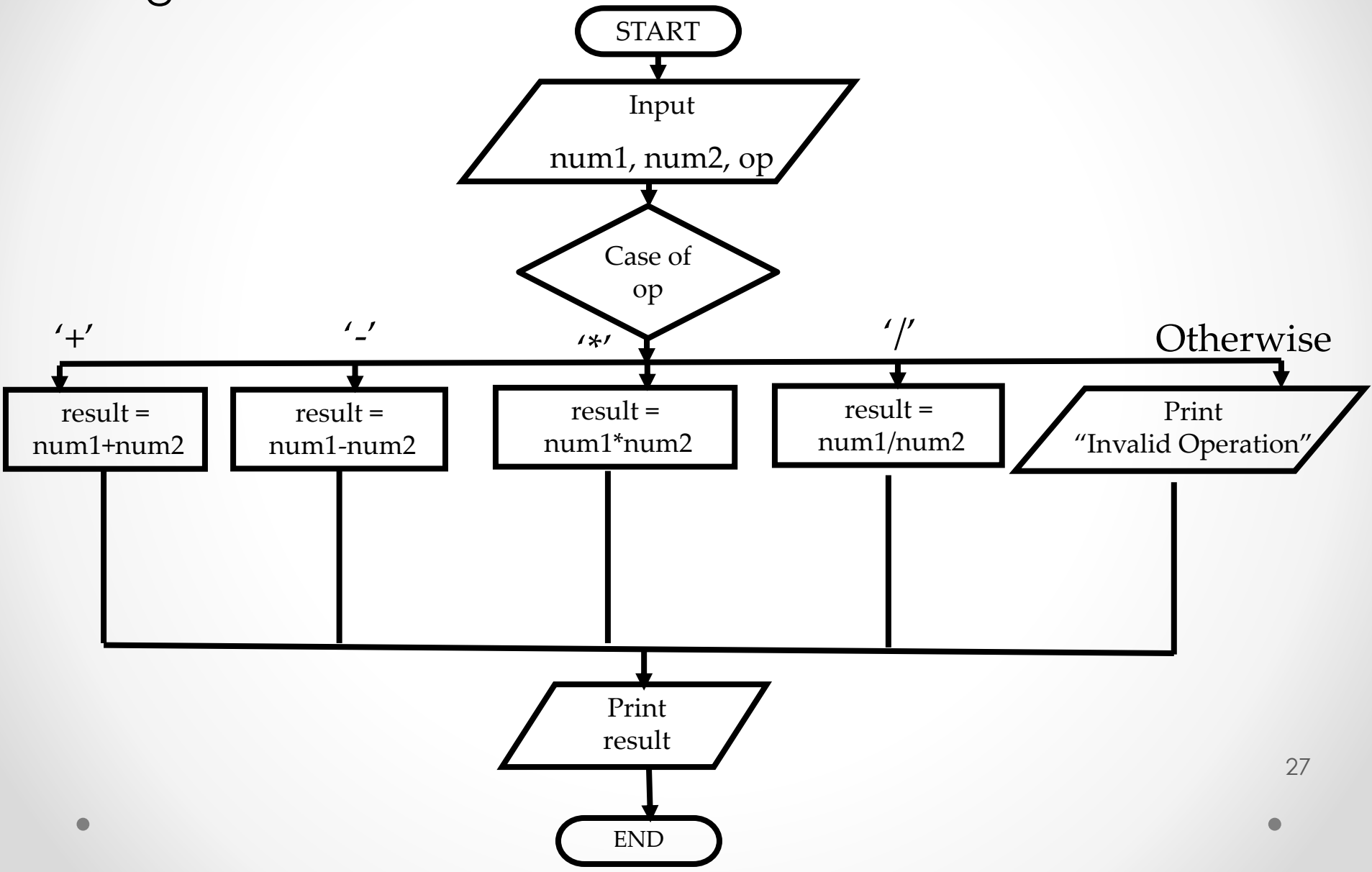
```
#include<iostream>
using namespace std;
int main()
    {
    int rank , reading;
    cout <<"Enter rank: ";
    cin>> rank;
    cout<<"Enter Reading watt: ";
    cin>> reading;
    float price = 0;
    switch (rank)
    {
         case 1:
              price = (reading/100.0) *1 ;
              if(price < 10)
                   cout<<"Total     cost     is:
    10"<<endl;
              else
             cout<<"Total         cost         is:
            "<<price<<endl;
                   break;
         case 2:
              price = (reading/100.0)*2;
              if(price <= 400)
                   cout<<"Total cost is:
    "<<price<<endl;
              else
                   cout<<"Total cost is: 400"
    << endl;
              break;
         case 3:
              price = (reading/100.0)*2.5;
              cout<<"Total cost is:"
    <<price<<endl;
              break;

    }
    return 0;
}
```

Exercise 6

- Write a program for a calculator that works on integer numbers. The user enters two numbers to perform only one of three basic arithmetic operations (+, -, * and /).
- The interaction with the user might look like this: Enter your Fractional expression: 1 + 2 The result = 3
- Hint: The user is allowed to do only one operation at a time.

Exercise 6 (cont.)

- Using case structure



Exercise 6: Solution

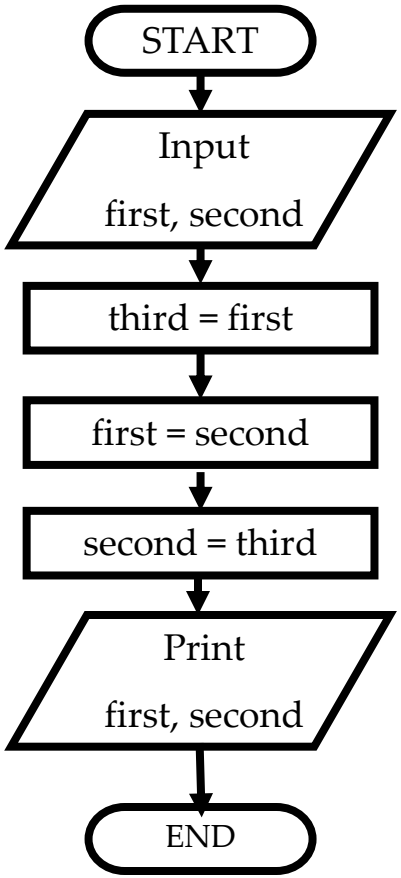
```
# include <iostream>
using namespace std;
int main()
{
   char op;
   float num1, num2;
   cout << "Enter operator either + or - or * or /: ";
   cin >> op;
   cout << "Enter two operands: ";
   cin >> num1 >> num2;
   switch(op)
{        case '+':
             cout << num1+num2;
             break;
         case '-':
             cout << num1-num2;
             break;
         case '*':
             cout << num1*num2;
             break;
         case '/':
           if(num2 != 0)
             cout << num1/num2;
           else
             cout << "Error! Can not divide by 0";
             break;
         default: // If the operator is other than +, -, * or /, error message is shown
             cout << "Error! operator is not correct";
             break; }
 return 0; }
```

Exercises

Exercise 7

- Write a program to swap the values of two integers using third variable.

Exercise 7(cont.)



Exercise 7: Solution

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

int main()
{
int a = 5, b = 10, temp;
cout << "Before swapping." << endl;
cout << "a = " << a << ", b = " << b << endl;

temp = a;
a = b;
b = temp;

cout << "\nAfter swapping." << endl;
cout << "a = " << a << ", b = " << b << endl;

return 0;
}
```

Exercise 8

write a program to enter a letter and determine the letter is small letter, capital letter, number(0-9) or special character.

Exercise 8: Solution

```
void main(){
char letter;
cout<<"Please Enter Letter.."<<endl;
cin>>letter;
if(letter>='a'&&letter<='z')
cout<<"this is a SMALL letter\n";
else if(letter>='A'&&letter<='Z')
cout<<"this is a CAPITAL letter\n";
else if(letter>='0'&&letter<='9')
cout<<"this is a NUMBER\n";
else cout<<"this is a SPECIAL letter\n";
}
```

Exercise 9

- Write a C program to convert specified days into years, weeks and days.

Exercise 9:solution

```
#include<iostream>
using namespace std;
void main()
{
int days, years, weeks;

    cin>>days;

    // Converts days to years, weeks and days
    years = days/365;
    weeks = (days % 365)/7;
    days = days- ((years*365) + (weeks*7));

    printf("Years: %d\n", years);
    printf("Weeks: %d\n", weeks);
    printf("Days: %d \n", days);

}
```

Exercise 10

- Write a C program to check whether a triangle is Equilateral, Isosceles or Scalene

Exercise 10:solution

```
#include<iostream>
using namespace std;
void main()
{
int a,b,c;
cout<<"enter the triangle sides"<<endl;
cin>>a>>b>>c;
if(a==b&&b==c)
{
cout<<"the triangle is equilateral "<<endl;
}
else if((a==b)||(b==c)||(a==c))
{
cout<<"The triangle is isosceles"<<endl;
}
else
{
cout<<"The triangle is scalene "<<endl;
}
}
```

Exercise 11

Program that checks whether an input character is vowel letter or not (using switch case).

Exercise 11: Solution

```
#include<iostream>
using namespace std;
void main() {
char ch;
cout << "Enter Letter Please ..";
cin >> ch;
switch (ch) {
case 'a':
case 'A': cout << "vowel a"; break;
case 'e':
case 'E': cout << "vowel e"; break;
case 'i':
case 'I': cout << "vowel i"; break;
case 'o':
case 'O': cout << "vowel o"; break;
default: cout << "not a vowel";}
}
```

Thank You ☺