Conditional Statements

Comparison Operators

Operator	Action
==	Equal to
!=	Not equal to
>	Greater than
>=	Greater than or equal to
<	Less than
<=	Less than or equal to

Comparison Operators

```
// Comparison operators
int weight = 700;
Console.WriteLine(weight >= 500); // True
char gender = 'm';
Console.WriteLine(gender <= 'f'); // False
double colorWaveLength = 1.630;
Console.WriteLine(colorWaveLength > 1.621); // True
int a = 5;
int b = 7;
bool condition = (b > a) && (a + b < a * b);
Console.WriteLine(condition); // True
Console.WriteLine('B' == 'A' + 1); // True
```

Comparison of Integers and Characters

```
// Comparison of Integers and Characters
Console.WriteLine("char 'a' == 'a'? " + ('a' == 'a')); // True
Console.WriteLine("char 'a' == 'b'? " + ('a' == 'b')); // False
Console.WriteLine("5 != 6? " + (5 != 6)); // True
Console.WriteLine("5.0 == 5L? " + (5.0 == 5L)); // True
Console.WriteLine("true == false? " + (true == false)); // False
```

Comparison of References to Objects

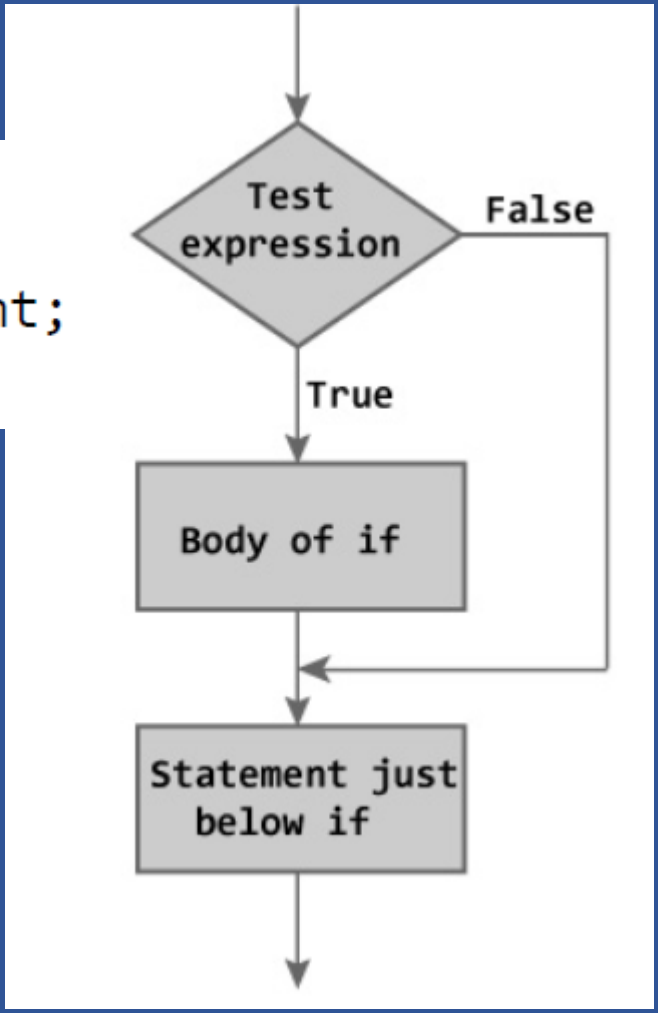
```
// Comparison of References to Objects
string str = "beer";
string anotherStr = str;
string thirdStr = "bee";
thirdStr = thirdStr + 'r';
Console.WriteLine("str = {0}", str);
Console.WriteLine("anotherStr = {0}", anotherStr);
Console.WriteLine("thirdStr = {0}", thirdStr);
Console.WriteLine(str == anotherStr); // True - same object
Console.WriteLine(str == thirdStr); // True - equal objects
Console.WriteLine((object)str == (object)anotherStr); // True
Console.WriteLine((object)str == (object)thirdStr); // False
```

Logical Operators

```
// Logical Operators
bool result1 = (2 < 3) && (3 < 4);   // True
bool result2 = (2 < 3) || (1 == 2);  // True
Console.WriteLine("Exclusive OR: " + ((2 < 3) ^ (4 > 3)));
// Exclusive OR: False
bool value = !(7 == 5); // True
Console.WriteLine(value);
```

If Statement

```
if (Boolean expression)
{
   Body of the conditional statement;
}
```



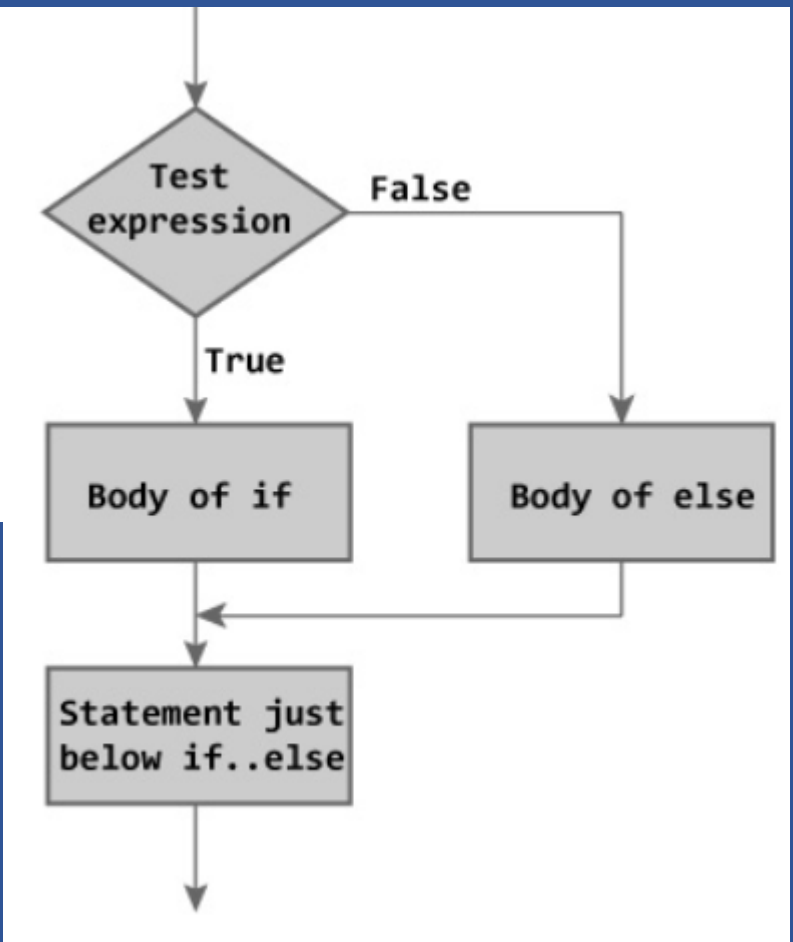
If Statement example

```
Console.WriteLine("Enter two numbers.");
Console.Write("Enter first number: ");
int firstNumber = int.Parse(Console.ReadLine());
Console.Write("Enter second number: ");
int secondNumber = int.Parse(Console.ReadLine());
int biggerNumber = firstNumber;
if (secondNumber > firstNumber)
{
    biggerNumber = secondNumber;
}
Console.WriteLine("The bigger number is: {0}", biggerNumber);
//Enter two numbers.
//Enter first number: 4
//Enter second number: 5
//The bigger number is: 5

int a = 6;
if (a > 5)
    Console.WriteLine("The variable is greater than 5.");
    Console.WriteLine("This code will always execute!");
// Bad practice: misleading code
```

If else statement

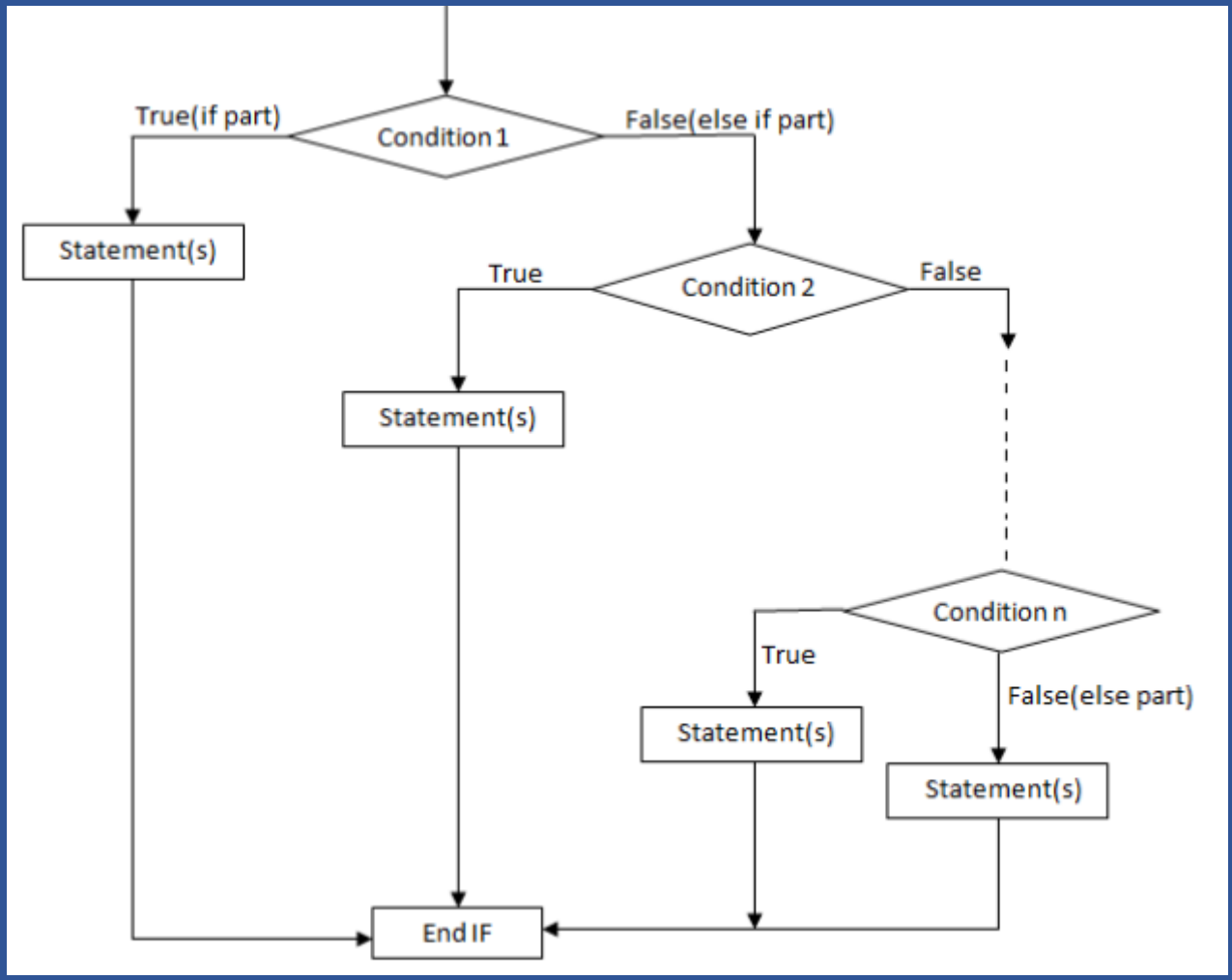
```
if (Boolean expression)
{
   Body of the conditional statement;
}
else
{
   Body of the else statement;
}
```



If else example

```
// if else example
int x = 2;
if (x > 3)
{
    Console.WriteLine("x is greater than 3");
}
else
{
    Console.WriteLine("x is not greater than 3");
}
// x is not greater than 3
```

Nested " if " Statements



Nested " if " Statements – Example

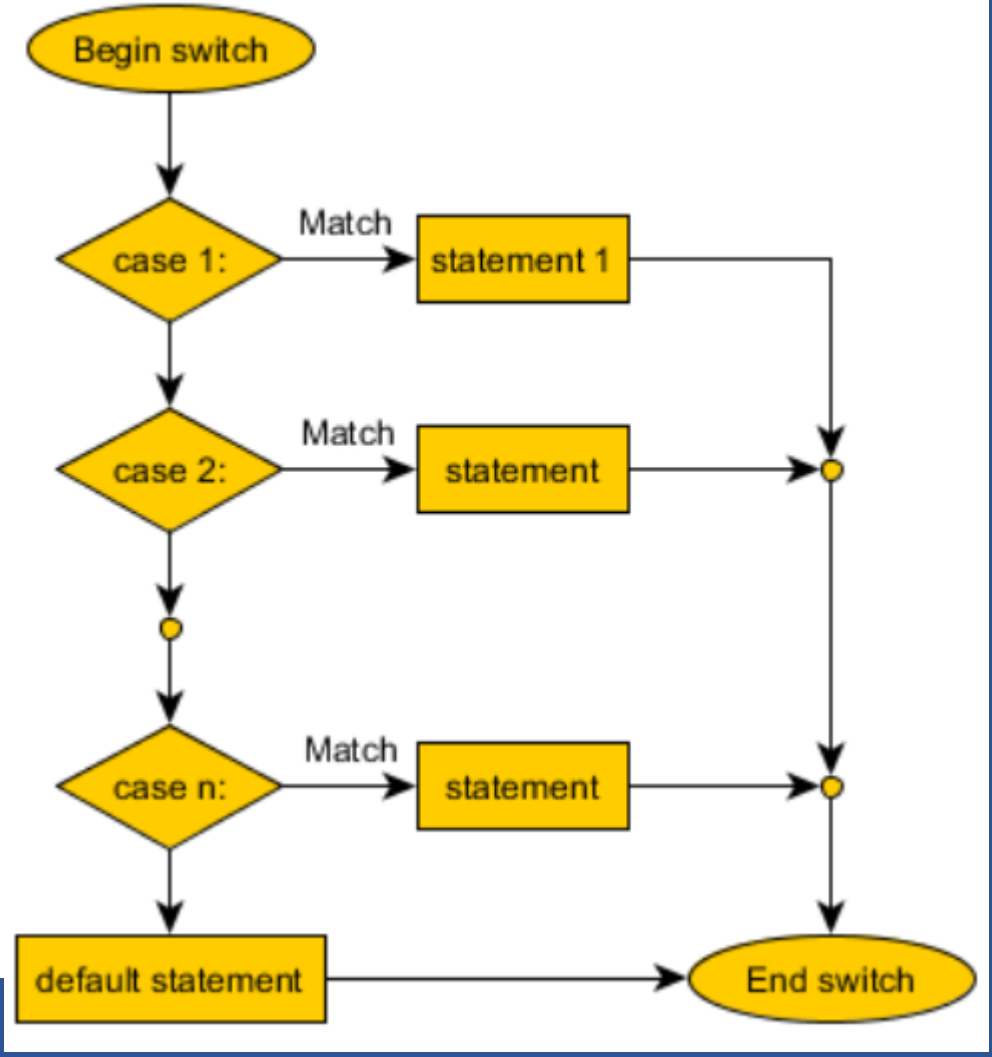
```
// Nested "if" Statements - Example
int first = 5;
int second = 3;
if (first == second)
{
    Console.WriteLine("These two numbers are equal.");
}
else
{
    if (first > second)
    {
        Console.WriteLine("The first number is greater.");
    }
    else
    {
        Console.WriteLine("The second number is greater.");
    }
}
// The first number is greater.
```

If else if statement

```
char ch = 'X';
if (ch == 'A' || ch == 'a')
{
    Console.WriteLine("Vowel [ei]");
}
else if (ch == 'E' || ch == 'e')
{
    Console.WriteLine("Vowel [i:]");
}
else if (ch == 'I' || ch == 'i')
{
    Console.WriteLine("Vowel [ai]");
}
else if (ch == 'O' || ch == 'o')
{
    Console.WriteLine("Vowel [ou]");
}
else if (ch == 'U' || ch == 'u')
{
    Console.WriteLine("Vowel [ju:]");
}
else
{
    Console.WriteLine("Consonant");
}
// Consonant
```

Switch-case statement

```
switch (integer_selector)
{
   case integer_value_1:
      statements;
      break;
   case integer_value_2:
      statements;
      break;
   // …
   default:
      statements;
      break;
}
```



switch-case example

```
int number = 6;
switch (number)
{
    case 1:
    case 4:
    case 6:
    case 8:
    case 10:
        Console.WriteLine("The number is not prime!"); break;
    case 2:
    case 3:
    case 5:
    case 7:
        Console.WriteLine("The number is prime!"); break;
    default:
        Console.WriteLine("Unknown number!"); break;
}
// The number is not prime!
```

Exercises

1. Write an if-statement that takes two integer variables and exchanges their values if the first one is greater than the second one.

2. Write a program that shows the sign (+ or -) of the product of three real numbers, without calculating it. Use a sequence of if operators.

3. Write a program that finds the biggest of three integers, using nested if statements.

4. Sort 3 real numbers in descending order. Use nested if statements.

5. Write a program that asks for a digit (0-9), and depending on the input, shows the digit as a word (in English). Use a switch statement.

6. Write a program that gets the coefficients a, b and c of a quadratic equation: ax2 + bx + c, calculates and prints its real roots (if they exist). Quadratic equations may have 0, 1 or 2 real roots.

7. Write a program that finds the greatest of given 5 numbers.

8. Write a program that, depending on the user's choice, inputs int, double or string variable. If the variable is int or double, the program increases it by 1. If the variable is a string, the program appends "*" at the end. Print the result at the console. Use switch statement.

9. We are given 5 integer numbers. Write a program that finds those subsets whose sum is 0. Examples:

- If we are given the numbers {3, -2, 1, 1, 8}, the sum of -2, 1 and 1 is 0.

- If we are given the numbers {3, 1, -7, 35, 22}, there are no subsets with sum 0.

10. Write a program that applies bonus points to given scores in the range [1…9] by the following rules:

- If the score is between 1 and 3, the program multiplies it by 10.

- If the score is between 4 and 6, the program multiplies it by 100.

- If the score is between 7 and 9, the program multiplies it by 1000.

- If the score is 0 or more than 9, the program prints an error message.

11. * Write a program that converts a number in the range [0…999] to words, corresponding to the English pronunciation. Examples:

- 0 --> "Zero"
- 12 --> "Twelve"
- 98 --> "Ninety eight"
- 273 --> "Two hundred seventy three"
- 400 --> "Four hundred"
- 501 --> "Five hundred and one"
- 711 --> "Seven hundred and eleven"