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# The Conditional Operator

* There are many situations where we need to assign a variable to a different value depending on the result of a condition
* For example, the if-else-if and switch statements in the previous section were used to decide which value to assign to the variable monthName
* A simpler example: Imagine your program needs to tell the user whether a number is even or odd. You need to initialize a string variable to either “Even” or “Odd” depending on whether myInt % 2 is equal to 0. We could write an if statement to do this:

string output;  
if(myInt % 2 == 0)  
{  
 output = "Even";  
}  
else  
{  
 output = "Odd";  
}

## Assignment with the conditional operator

* If the only thing an if statement does is assign a value to a variable, there is a much shorter way to write it
* The **conditional operator** ?: tests a condition, and then outputs one of two values based on the result
* Continuing the “even or odd” example, the conditional operator is used like this:

string output = (myInt % 2 == 0) ? "Even" : "Odd";

When this line of code is executed:

* The condition (myInt % 2 == 0) is evaluated, and the result is either true or false
* If the condition is true, the conditional operator returns (outputs) the value "Even" (the left side of the :)
* If the condition is false, the operator returns the value "Odd" (the right side of the :)
* This value, either “Even” or “Odd”, is used in the initialization statement for string output
* Thus, output gets assigned the value "Even" if (myInt % 2 == 0) is true, or "Odd" if (myInt % 2 == 0) is false
* In general, the syntax for the conditional operator is:

condition ? true\_expression : false\_expression;

* The “condition” can be any expression that produces a bool when evaluated, just like in an if statement
* true\_expression and false\_expression can be variables, values, or more complex expressions, but they must both produce the same *type* of data when evaluated
* For example, if true\_expression is myInt \* 1.5, then false\_expression must also produce a double
* When the conditional operator is evaluated, it returns either the value of true\_expression or the value of false\_expression (depending on the condition) and this value can then be used in other operations such as assignment

## Conditional operator examples

* The true\_expression and false\_expression can both be mathematical expressions, and only one of them will get computed. For example:

int answer = (myInt % 2 == 0) ? myInt / 2 : myInt + 1;

If myInt is even, the computer will evaluate myInt / 2 and assign the result to answer. If it is odd, the computer will evaluate myInt + 1 and assign the result to answer.

* Conditional operators can be used with user input to quickly provide a “default value” if the user’s input is invalid. For example, we can write a program that asks the user their height, but uses a default value of 0 if the user enters a negative height:

Console.WriteLine("What is your height in meters?");  
double userHeight = double.Parse(Console.ReadLine());  
double height = (userHeight >= 0.0) ? userHeight : 0.0;

* The condition can be a Boolean variable by itself, just like in an if statement. This allows you to write code that looks kind of like English, due to the question mark in the conditional operator. For example,

bool isAdult = age >= 18;  
decimal price = isAdult ? 5.0m : 2.5m;  
string closingTime = isAdult ? "10:00 pm" : "8:00 pm";