An **out variable** is a variable declared at the point where it is passed to a method as an `out` argument.

Overloading involves the ability to write multiple versions of a method using the same method name but different parameter lists.

A method's **signature** is composed of its name and parameter list.

Overload resolution is the process of determining which of multiple applicable methods is the best match for a method call.

Applicable methods are all the methods that could be used by a method call.

Betterness rules are the rules that determine the best overloaded method to execute based on the arguments in a method call.

Ambiguous methods are overloaded methods from which the compiler cannot determine which one to use.

A **named argument** is a method argument that is preceded with the name of the called method's parameter to which it will be assigned.

A **positional argument** is an unnamed method argument that is assigned to a parameter list based on its position in the method call.

Self-documenting describes programs that provide built-in explanations to make the code clearer to readers and therefore easier for others to modify in the future.

Review Questions

1. A mandatory parameter _____.
   a. requires an argument to be sent from a method call
   b. is any argument sent to a method
   c. is preceded by the keyword `man`
   d. All of the above are true.

2. Which is *not* a type of method parameter in C#?
   a. value
   b. forensic
   c. reference
   d. output

3. Which type of method parameter receives the address of the variable passed in?
   a. a value parameter
   b. a reference parameter
   c. an output parameter
   d. two of the above

4. When you declare a value parameter, you precede its name with _____.

   a. nothing
   b. a data type
   c. the keyword `val` and a data type
   d. the keyword `ref` and its data type

5. Assume that you declare a variable as `int x = 100;` and correctly pass it to a method with the declaration `private static void IncreaseValue(ref int x)`. There is a single statement within the `IncreaseValue()` method: `x = x + 25;`. Back in the `Main()` method, after the method call, what is the value of `x`?

   a. 100
   b. 125
   c. It is impossible to tell.
   d. The program will not run.

6. Assume that you declare a variable as `int x = 100;` and correctly pass it to a method with the declaration `private static void IncreaseValue(int x)`. There is a single statement within the `IncreaseValue()` method: `x = x + 25;`. Back in the `Main()` method, after the method call, what is the value of `x`?

   a. 100
   b. 125
   c. It is impossible to tell.
   d. The program will not run.

7. A reference parameter differs from an output parameter in that a reference parameter _____ but an output parameter does not.

   a. receives a memory address
   b. occupies a unique memory address
   c. requires an initial value
   d. must be a simple data type

8. A parameter array _____.

   a. is declared using the keyword `params`
   b. can accept any number of arguments of the same data type
   c. Both of these are true.
   d. Neither of these is true.

9. Assume that you have declared a method with the following header:
   `private static void DisplayScores(params int[] scores)`
   Which of the following method calls is valid?

   a. `DisplayScores(20);`
   b. `DisplayScores(20, 33);`
   c. `DisplayScores(20, 30, 90);`
   d. All of the above are valid.

10. Correctly overloaded methods must have the same _____.

    a. return type
    b. identifier
    c. parameter list
    d. All of the above.

11. Methods are ambiguous when they _____.

    a. are overloaded
    b. are written in a confusing manner
    c. are indistinguishable to the compiler
    d. have the same parameter type as their return type

12. Which of the following pairs of method declarations represent correctly overloaded methods?

    a.
    ```
    private static void MethodA(int a)
    private static void MethodA(int b, double c)
    ```
    b.
    ```
    private static void MethodB(double d)
    private static void MethodB()
    ```
    c.
    ```
    private static double MethodC(int e)
    private static double MethodD(int f)
    ```
    d. Two of these are correctly overloaded methods.

13. Which of the following pairs of method declarations represent correctly overloaded methods?

    a.
    ```
    private static void Method(int a)
    private static void Method(int b)
    ```
    b.
    ```
    private static void Method(double d)
    private static int Method()
    ```
    c.
    ```
    private static double Method(int e)
    private static int Method(int f)
    ```
    d. Two of these are correctly overloaded methods.

14. The process of determining which overloaded version of a method to execute is overload _____.

    a. confusion
    b. infusion
    c. revolution
    d. resolution

15. When one of a method's parameters is optional, it means that _____.
    a. no arguments are required in a call to the method
    b. a default value will be assigned to the parameter if no argument is sent for it
    c. a default value will override any argument value sent to it
    d. you are not required to use the parameter within the method body

16. Which of the following is an illegal method declaration?
    a.
    ```
    private static void CreateStatement(int acctNum,
    double balance = 0.0)
    ```
    b.
    ```
    private static void CreateStatement(int acctNum = 0,
    double balance)
    ```
    c.
    ```
    private static void CreateStatement(int acctNum = 0,
    double balance = 0)
    ```
    d. All of these are legal.

17. Assume you have declared a method as follows:
    ```
    private static double ComputeBill(int acct, double price,
    double discount = 0)
    ```
    Which of the following is a legal method call?
    a. `ComputeBill();`
    b. `ComputeBill(1001);`
    c. `ComputeBill(1001, 200.00);`
    d. None of the above is legal.

18. Assume you have declared a method as follows:
    ```
    private static double CalculateDiscount(int acct = 0,
    double price = 0, double discount = 0)
    ```
    Which of the following is a legal method call?
    a. `CalculateDiscount();`
    b. `CalculateDiscount(200.00);`
    c. `CalculateDiscount(3000.00, 0.02);`
    d. None of the above is legal.

19. Assume you have declared a method as follows:
    ```
    private static double DisplayData(string name = "XX",
    double amount = 10.0)
    ```
    Which of the following is an illegal method call?
    a. `DisplayData(name : "Albert");`
    b. `DisplayData(amount : 200, name : "Albert");`
    c. `DisplayData(amount : 900.00);`
    d. All of these are legal.

20. Suppose that you have declared an integer array named `scores`, and you make the following method call:

```
TotalScores(scores, num : 1);
```

Of the following overloaded method definitions, which would execute?

a.
```
private static void TotalScores(int[] scores)
```

b.
```
private static void TotalScores(int[] scores, int num)
```

c.
```
private static void TotalScores(int[] scores, int num = 10,
    int code = 10)
```

d. The program would not compile.