Controlling Number of Loop Iterations

- If the number of iterations is known before the loop starts, the loop is called a count-controlled loop.
  - Use a `for` loop.
- Asking the user before each iteration if it is time to end the loop is called the ask-before-iterating technique.
  - Appropriate for a small number of iterations
  - Use a `while` loop or a `do-while` loop.

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The `break` Statement in Loops

- A `break` statement can be used to end a loop immediately.
- The `break` statement ends only the **innermost** loop or switch statement that contains the `break` statement.
- `break` statements make loops more difficult to understand.
- Use `break` statements sparingly (if ever).

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The `break` Statement in Loops

- Note program fragment, ending a loop with a `break` statement, listing 4.8

```
while (itemNumber <= MAX_ITEMS)
{
    . . .
    if (itemCost <= leftToSpend)
    {
        . . .
        if (leftToSpend > 0)
            itemNumber++;
        else
        {
            System.out.println("You are out of money.");
            break;
        }
    }
    else
        . . .
}

System.out.println( . . . );
```


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The `continue` Statement in Loops

- A `continue` statement
  - Ends current loop iteration
  - Begins the next one
- Text recommends avoiding use
  - Introduce unneeded complications

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Arrays

Chapter 7

*JAVA: An Introduction to Problem Solving & Programming, 8*th Ed. By Walter Savitch
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Creating and Accessing Arrays

- An array is a special kind of object
- Think of as collection of variables of same type
- Creating an array with 7 variables of type double

```
double[] temperature = new double[7];
```

- To access an element use
  - The name of the array
  - An index number enclosed in braces
- Array indices begin at zero

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Array Details

- Syntax for declaring an array with **new**

```
Base_Type[] Array_Name = new Base_Type[Length];
```

- The number of elements in an array is its length
- The type of the array elements is the array's base type

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Square Brackets with Arrays

- With a data type when declaring an array

```
int [ ] pressure;
```

- To enclose an integer expression to declare the length of the array

```
pressure = new int [100];
```

- To name an indexed value of the array

```
pressure[3] = key.nextInt();
```


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Selection Sort

- Consider arranging all elements of an array so they are ascending order
- Algorithm is to step through the array
  - Place smallest element in index 0
  - Swap elements as needed to accomplish this

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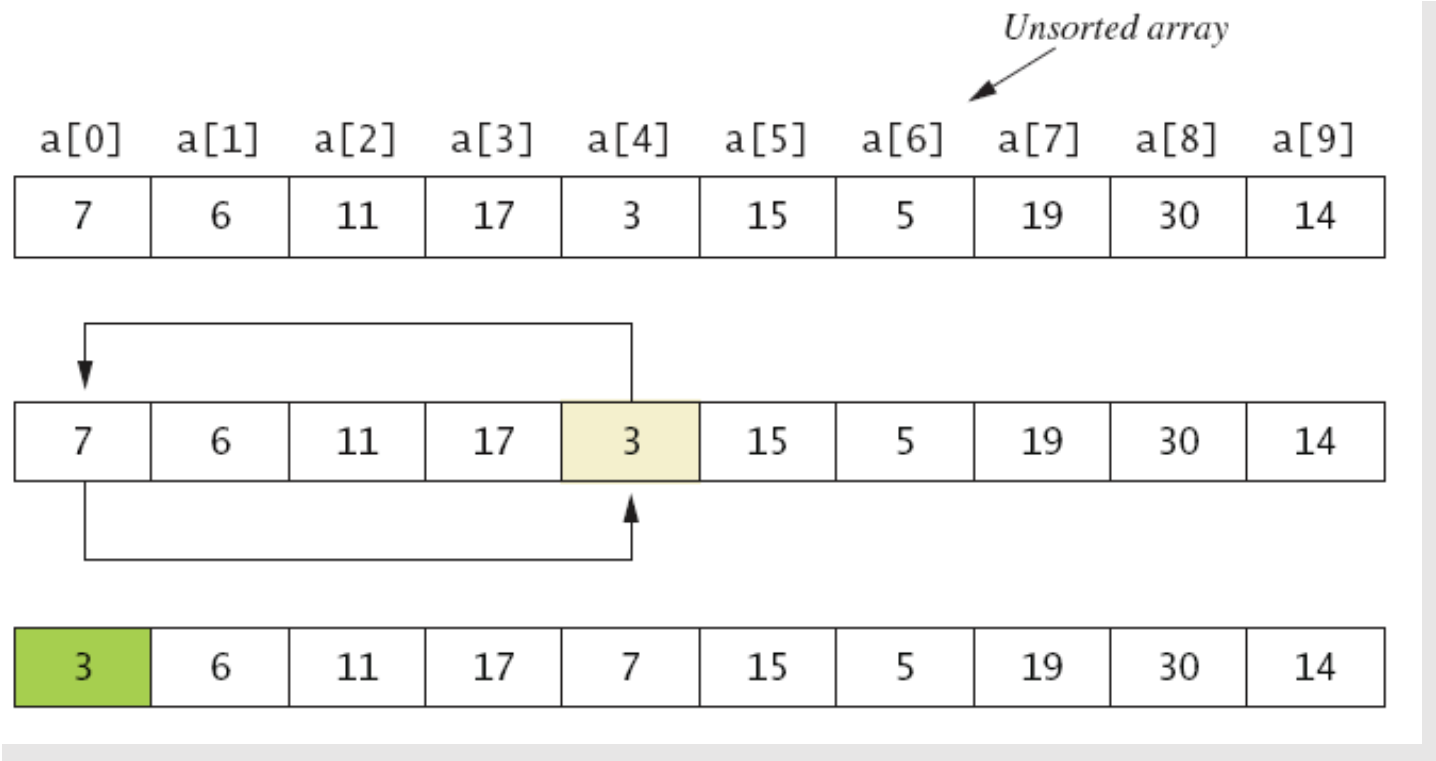
Selection Sort

- Figure 7.5a



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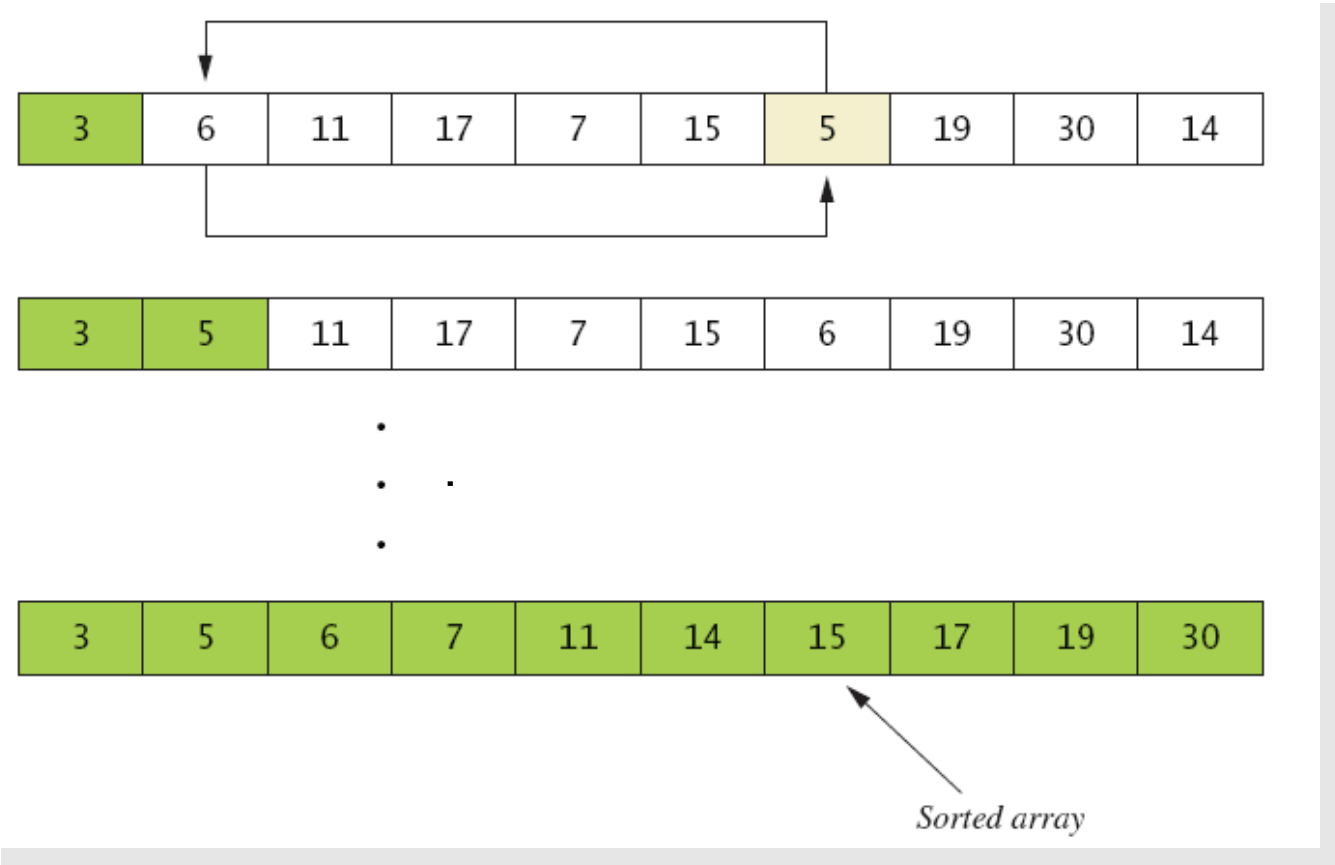
Selection Sort

- Figure 7.5b



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