

# Java Programming AP Edition

## U1C2 Elementary Programming

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DEMO PROGRAM: COMPUTEAREA.JAVA

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# ComputeArea.java

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```
public class ComputeArea {
    public static void main(String[] args) {
        double radius;    // Declare radius
        double area;      // Declare area
        // Assign a radius
        radius = 20; // New value is radius
        // Compute area
        area = radius * radius * 3.14159;
        // Display results
        System.out.println("The area for the circle of radius " + radius + " is " + area);
    }
}
```



# Trace a Program Execution

```
public class ComputeArea {  
    /** Main method */  
    public static void main(String[] args) {  
        double radius;  
        double area;  
  
        // Assign a radius  
        radius = 20;  
  
        // Compute area  
        area = radius * radius * 3.14159;  
  
        // Display results  
        System.out.println("The area for the circle of radius " +  
            radius + " is " + area);  
    }  
}
```

allocate memory  
for radius

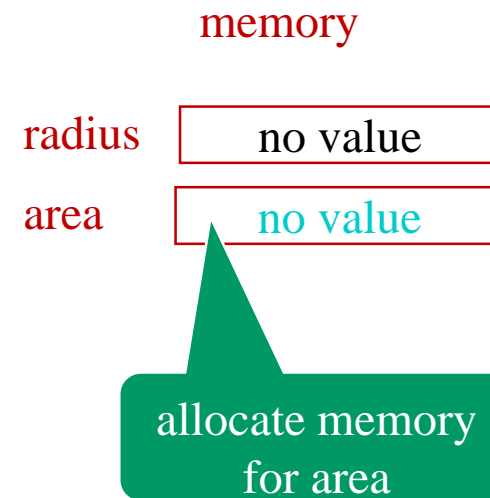
radius

no value



# Trace a Program Execution

```
public class ComputeArea {  
    /** Main method */  
    public static void main(String[] args) {  
        double radius;  
        double area;  
  
        // Assign a radius  
        radius = 20;  
  
        // Compute area  
        area = radius * radius * 3.14159;  
  
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        System.out.println("The area for the circle of radius " +  
            radius + " is " + area);  
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        double radius;  
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        // Assign a radius  
        radius = 20;  
  
        // Compute area  
        area = radius * radius * 3.14159;  
  
        // Display results  
        System.out.println("The area for the circle of radius " +  
            radius + " is " + area);  
    }  
}
```

assign 20 to radius

radius  
area

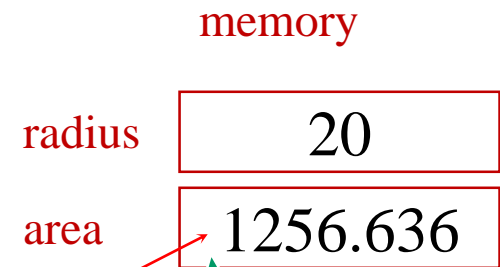
20

no value



# Trace a Program Execution

```
public class ComputeArea {  
    /** Main method */  
    public static void main(String[] args) {  
        double radius;  
        double area;  
  
        // Assign a radius  
        radius = 20;  
  
        // Compute area  
        area = radius * radius * 3.14159;  
  
        // Display results  
        System.out.println("The area for the circle of radius " +  
            radius + " is " + area);  
    }  
}
```



compute area and assign it to variable area



# Trace a Program Execution

```
public class ComputeArea {  
    /** Main method */  
    public static void main(String[] args) {  
        double radius;  
        double area;  
  
        // Assign a radius  
        radius = 20;  
  
        // Compute area  
        area = radius * radius * 3.14159;  
  
        // Display results  
        System.out.println("The area for the circle of radius " +  
            radius + " is " + area);  
    }  
}
```

memory

radius

20

area

1256.636

print a message to the console

```
C:\> java ComputeArea  
The area for the circle of radius 20.0 is 1256.636
```



# Java's Basic Terminology

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**Variable:** A variable represents a value stored in the computer's memory. It has a name and a value. Name is associated with an address. Value is a piece of data.

**Variable Declaration:** Specify the data type for a variable.

**Primitive data types (fundamental types):**

Integer: byte, short, int, long;

Floating numbers: float, double;

Text: char;

Logic: Boolean

Other data types are **reference type**. (covered in chapter 4)





# Reference Data Type

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A **reference type** is a data type that's based on a class rather than on one of the primitive types that are built in to the Java language. The class can be a class that's provided as part of the Java API class library or a class that you write yourself.

**Reference types** are any instantiable class as well as arrays

String, Scanner, Random, Die, int[], String[], etc.

**Reference variables** store addresses. (**Address Pointer** is the value of the reference variable.)