



Tutorial 09

Objects & Classes: Methods | Constructors | Access Control

Exercise 1:

Given the following method, point out the following:

- Modifier
- Return type
- Returned value
- Method header
- Method signature
- Method name
- Parameters list
- Method body

```
public static int max(int num1, int num2) {  
    int result = 0;  
    if (num1 > num2)  
        result = num1;  
    else  
        result = num2;  
    return result;  
}
```

Exercise 2:

Show the output of the following program:

```
class Test {  
    public static void method1(int i, int num) {  
        for (int j=1; j <= i; j++) {  
            System.out.print(num + " ");  
            num *= 2;  
        }  
        System.out.println();  
    }  
  
    public static void main(String[] args) {  
        int i = 1;  
        while (i <= 6) {  
            method1(i, 2);  
            i++;  
        }  
    }  
}
```

Exercise 3

Implement the class Time in Java

Attributes:

- **sec**: seconds between 0 and 59
- **min** : minutes between 0 and 59
- **hour** : can be any positive integer

Methods

- **readTime** : reads values of sec, min and hour from the keyboard
- **fixTime** : assures that sec and min are in the appropriate ranges
- **toSec** : converts the time to seconds
- **addSec** : increases the seconds by amount s, keeping sec and min within ranges
- **addMin** : increases the minutes by amount m keeping sec and min within ranges
- **addHour** : increases the hours by amount h
- **addTime** : increases the time by sec, min, hour of t
- **display** : prints the attribute values in the format: hour:mm:ss

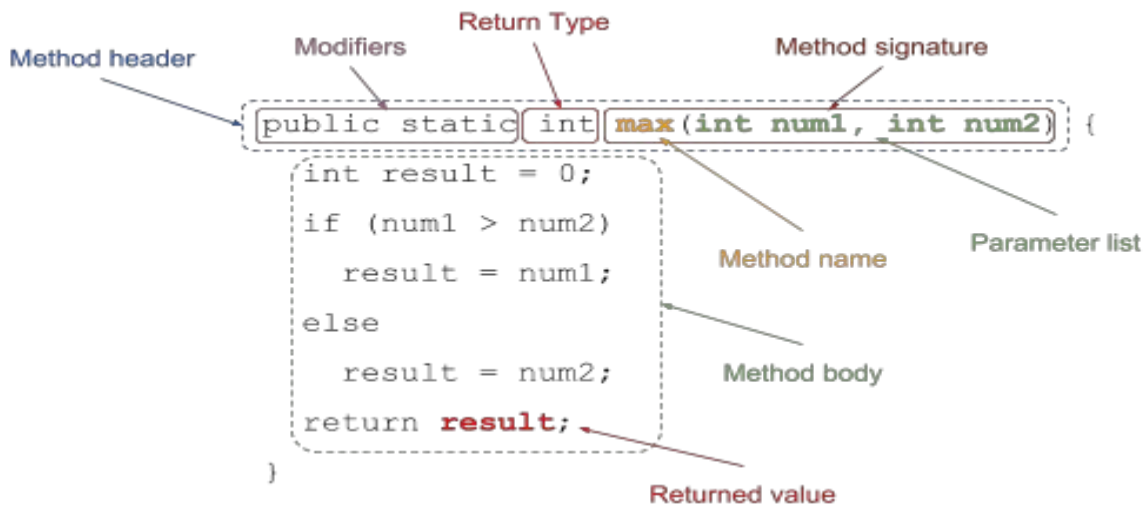
Exercise 4

Write a program that uses class Time to do the following:

- create two objects t1 and t2 of class Time and read their information
- increase t1 by 37 seconds and t2 by 15 minutes
- Tell whether t1 occurs after t2 or not
- increase t1 by t2 and print it

Tutorial 09 Solutions

Exercise 1:



Exercise 2:

```
2
2 4
2 4 8
2 4 8 16
2 4 8 16 32
2 4 8 16 32 64
```

Exercise 3:

```
import java.util.Scanner;
class Time {
    public int sec, min, hour;
    public void readTime() {
        Scanner S = new Scanner(System.in);
        System.out.print("Enter the seconds: ");
        sec = S.nextInt();
        System.out.print("Enter the minutes: ");
        min = S.nextInt();
        System.out.print("Enter the hours: ");
        hour = S.nextint();
        fixTime();
    }
    public void fixTime() {
        min += sec / 60;
        sec %= 60;
        hour += min / 60;
        min %= 60;
    }
}
```

```

public int toSec() {
    int result;
    result = sec + min*60 + hour*3600;
    return result;
}
public void addSec(int s) {
    sec += s;
    fixTime();
}
public void addMin(int m) {
    min += m;
    fixTime();
}
public void addHour(int h) {
    hour += h;
}
public void display() {
    String result = hour+": ";
    if (min < 10) result += "0";
    result += min+": ";
    if (sec < 10) result += "0";
    result += sec;
    System.out.println(result);
}
public void addTime(Time t) {
    addSec(t.sec);
    addMin(t.min);
    addHour(t.hour);
}
} // end of class

```

Exercise 4:

```

class TestTime {
    public static void main(string[] args) {
        Time t1 = new Time();
        t1.readTime();
        Time t2 = new Time();
        t2.readTime();
        t1.addSec(37);
        t2.addMin(15);
        if (t1.toSec() > t2.toSec())
            System.out.println("t1 occurs after t2");
        else
            System.out.println("t1 does not occur after t2");
        t1.addTime(t2);
        t1.display();
    }
}

```