Tutorial 09

Objects & Classes: Methods | Constructors | Access Control

Exercise 1:

Given the following method, point out the following:

a) Modifier
b) Return type
c) Returned value
d) Method header
e) Method signature
f) Method name
g) Parameters list
h) 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

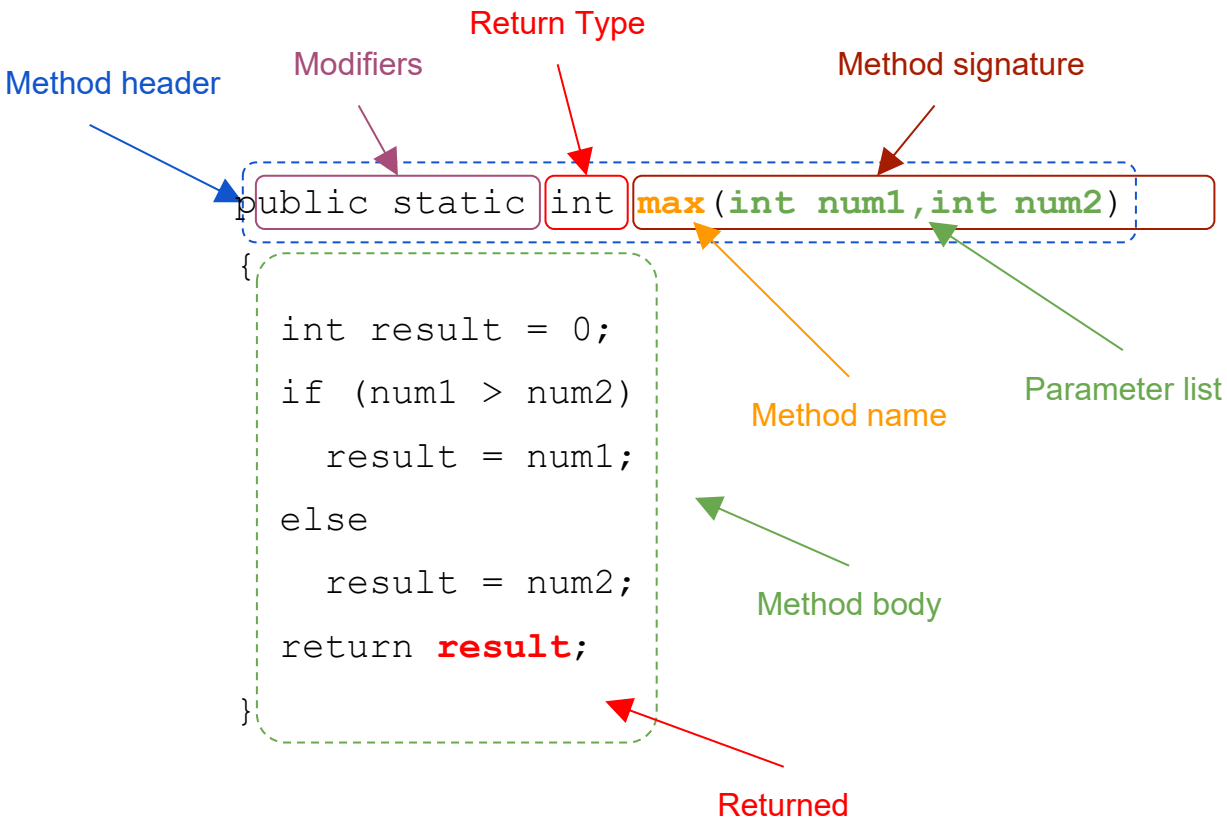
Exercise 4

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 minuetes
- Tell whither 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();
  }
}
```