Tutorial 1

This tutorial will help you transition from using Python to using object-oriented Java. Please complete the following questions which will help you learn the basics of Java.

1. **Java vs Python**

a.) What is the difference between Java and Python when declaring variables?

b.) Why is static typing considered safer than dynamic typing?

c.) How are methods and classes in code separated when using Java?

**2. Object-oriented design**

1. What two parts does a class contain?
2. How are each of these parts represented?
3. What do you call to create a new instance of a class (a new object)?
4. What is the difference between a static and instance method?
5. How do you call a static method?
6. How do you call a non-static method?

**3. Java identifiers**

a). What are some of the ways in which an identifier will be illegal/not valid in Java? Describe three different ways.

**4. Variable scope and for loop**

Examine the segment of code in the box below.

a). What is the scope of the variable name?

b). What is the scope of the variable n?

c). What is the scope of the variable x?

d). What is he scope of the variable p?

**public class Professor {**

**private String name;**

**private int age;**

**public Professor(String n, int a) {**

**name = n;**

**age = a;**

**}**

**public void m1() {**

**System.out.print(name + “ is”);**

**for (int x = 0; x <= age; x++) {**

**System.out.println(“ ” + x + “,”)**

**System.out.println(“ years old”);**

**}**

**public static void main(String[] args) {**

**Professor p = new Professor(“Professor X”, 84);**

**p.m1();**

**}**

**}**

**5. Pre and post increment/decrement**

What do you think the following code segment will output?

**int a = 7;**

**int b = 9;**

**System.out.println(--a + b--);**

**System.out.println(a);**

**System.out.println(b);**

**int c = 5;**

**int d = 3;**

**System.out.println(c++ - ++d);**

**System.out.println(c);**

**System.out.println(d);**

Explain why the code behaved in this way?

**6. Overloading**

Examine the segment of code in the box

**public class Area {**

**public Area(String s, int a, int b){**

**System.out.println(s + “ ” + a \* b);**

**}**

**public Area(String s, int a) {**

**System.out.println(s + “ ” + a \* a);**

**}**

**public Area(int a) {**

**System.out.println(“Area ” + a);**

**}**

**...**

**}**

a). What would be the result of the following line?

Area a1 = new Area(“Area”, 4 , 6);

b). What would be the result of the following line?

Area a2 = new Area(“Area”, 7);

c) What would be the result of the following line?

Area a3 = new Area(51);

d) What would be the result of the following line?

Areaa4 = new Area(“Area”);

**7. Coding questions:**

a.) Complete the following program that asks the user for the title of his/her favourite movie. Once the user enters the title of the movie the system prints out “Your favourite movie is [title]”.

**import \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**public** **class** Foo {

**public** **static** **void** main(String[] args) {

//**TODO**

System.out.println(“What is your favourite movie?”);

\_\_\_\_\_\_\_\_\_\_ input = new \_\_\_\_\_\_\_\_\_ ( \_\_\_\_\_\_\_\_\_\_\_ );

\_\_\_\_\_\_\_\_\_\_ title = input.\_\_\_\_\_\_\_\_\_\_();

System.out.println(“Your favourite movie is \_\_\_\_\_\_\_\_\_\_);

}

}

b.) Complete the following class by completing the following method getGrade() which when passed a percentage of type int, returns a grade as the String.

* A++ for 100%
* A for 80-99%
* B for 65-79%
* C for 50-64%
* D for 0-49%

The following skeleton code is provided on the next page:

**public** **class** Foo {

**public** **static** **void** main(String[] args) {

String grade= *getGrade*(92);

System.***out***.println(grade);

}

**public** **static** String getGrade(**int** percentage){

String grade = "";

//**TODO**

**return** "Grade: " + grade;

}

}

Test your code by passing the following different percentages:

|  |  |
| --- | --- |
| **Percentage:** | **Grade:** |
| 92 | A |
| 79 | B |
| 12 | D |
| 100 | A++ |

c). Write a method named restaurantReview(int numberOfStars) that takes an int argument numberOfStars of the restaurant’s rating as input. Using a switch statement if numberOfStars is 1 the method prints “This restaurant is terrible”. If numberOfStars is 2 the method prints “This restaurant is not so good”. If numberOfStars is 3 the method prints “This restaurant is so so”. If numberOfStars is 4 the method prints “This restaurant is well worth a try”. If numberOfStars is 5 the method prints “This restaurant is a must”. Finally if the numberOfStars is of none of the above values the method prints “This restaurant has not yet been rated”.

**public** **class** Restaurant {

**public** **static** **void** main(String[] args) {

*restaurantReview*(4);

}

**public** **static** \_\_\_\_\_\_ restaurantReview(**\_\_\_\_\_\_\_\_**){

//**TODO**

}

}