

Java Assignments

Due Date: March 27, 2018

1. Define a class *Employee* and derive a class *Programmer* from it.

Here is the contract for *Employee*:

Employee(*n*, *s*) // construct an Employee with name *n* salary *s*

e.getName() // return the name of *e*

e.getSalary() // return the salary of *e*

e.setSalary(s) // set the salary of *e* to *s*

For class *Programmer*:

- Add a private instance variable of type String, called *language*, that represents the programming language in which the programmer works.
- Supply getter and setter methods for the *language* instance variable.
- Write a constructor for *Programmer* that calls the superclass constructor to set the name and salary then sets the *language* variable itself.

Create one *Employee* object and one *Programmer* object. Print the details of the *Employee* and *Programmer*. Now, update the salary of the *Programmer* by making it same as the *Employee*. Print the updated salary of the *Programmer*.

Expected Output:

Name of the Employee: ABC

Salary of the Employee: 100

Name of the Programmer: DEF

Salary of the Programmer: 200

Language of the Programmer: Java

Updated salary of the Programmer: 100

2. (a) Write code that deliberately throws a `NullPointerException`.
(b) Catch the preceding exception and print some subsequent output outside of any error-handling code.
3. (a) Create code that has a method named **`atomic()`**. Demonstrate in code how two threads can, sometimes, invoke **`atomic()`** concurrently.
(b) Make a version of the code in which the two threads CANNOT invoke **`atomic()`** concurrently.
4. Write code that accepts a string from the user and converts the even-indexed characters in the string to lower case and the odd-indexed characters in the string to upper case.

Sample Input:

Enter a string

MaThEmATiCs

Expected Output:

mAtHeMaTiCs

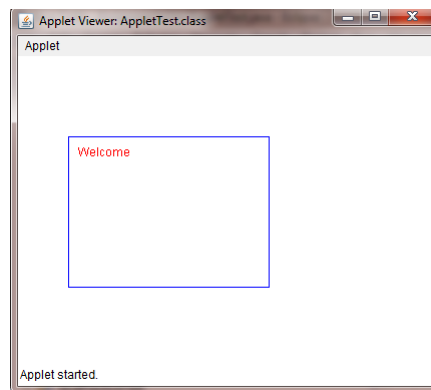
5. Create code that has a method which accepts two strings of equal length as parameters and returns a string that contains all unique two-character strings whose first character comes from the first string and second character comes from the second string. All two-character strings in your returned string should be separated by a space. Inputs should be given as command line arguments.

Sample Input: java MyProg ACDC ABBA

Expected Output: AA AB CA CB DA DB

6. Write an applet that draws a rectangle. The rectangle should have a width and height of 200 and 150 pixels respectively. Print a “Welcome” message that is fully contained inside the rectangle. The border of the rectangle should be blue. The color of the message should be red.

Expected Output:



7. Write a java program to implement three threads that will generate random number in between 10 and 20 and save it into single text file.
8. Write a java program to draw a circle, fill it with a specific color, and save it into an image file.
9. Write a java program to draw an image in applet. Use any image to draw. Your name should be written on the image.
10. Write a java program to show a moving ball using applet. Movement direction of the ball is up to you. The shape of the ball is 2D.
11. Write a java program to plot sine wave infinitely, varying with time.

Hint: To read and write image, look into the property of both “File” and “BufferedImage” class.