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| ../Pictures/N-Horiz-Full.jpg  **CSIS 44-542 Object-Oriented Programming**  **Spring 2017**  **Lab 02: Classes Lab Activity** |

**Objective:** Covers the creation and usage of **Class**, **Constructors**, **getter** and **setter** methods, and **Scanner** class

**NOTE:**

* Do not hard code any values.
* Do not use any conditional or looping statements for this lab.
* Check the sample output to know how the results need to be printed.
* Read every instruction carefully and follow them strictly.
* Do not change the name of the attributes, method given below.

1. Create a New Project and name it as **Lastname\_Lab02Classes** where **Lastname** is your last name.
2. Create a new package in the project created and name it as **employees.**
3. Create a new Java class in **employees** package and name it as **Employee**.
4. Write statements to declare the following attributes.

**Note:** Do not add any instance variables beyond those shown here. Access specifiers must be private for all the given instance variables.

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| **Attributes** | **Type** | **Attribute Description** |
| **firstName** | **String** | First name of the employee |
| **lastName** | **String** | Last name of the employee |
| **employeeID** | **int** | ID of the employee |
| **phoneNumber** | **String** | Phone number of the employee |
| **address** | **String** | Address of the employee |

1. Constructor:
   1. Create one constructor with parameters. The parameters are used to set the values of the instance variables.

**public Employee(String firstName, String lastName, int employeeID, String phoneNumber, String address)**

* 1. Create one no-argument constructor which calls the parameterized constructor with default values, inside its body.

1. Methods:
   1. Write **getter and setter** methods for each of the instance variables declared.
   2. Write a **toString()** method which should be used to display the values for each attribute. This method should return a String. See the sample output to know the pattern.

**Hint:** getters and setters can be auto generated in java, but it’s important you know the syntax.

1. Create a new Java Main class in **employees** package and name it as **EmployeeDriver**. Use (Copy and paste) the below given code in your main method to test your Employee class functionality.

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| // created the employee object with 4 argument constructor  Employee empObject01 = new  Employee("Lousie","Adams",34562,"6602240486", "9277 Fairway Drive, Apt#208, Des Plaines, IL");  System.out.println("Employee Details01");  System.out.println("  Employee ID: "+empObject01.getEmployeeID());  System.out.println("Name: " + empObject01.getFirstName() +" "+ empObject01.getLastName());  System.out.println("Address: "+empObject01.getAddress());  System.out.println("Contact Number: "+empObject01.getPhoneNumber());  System.out.println("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n");  // created the employee object with no-argument constructor  Employee empObject02 = new Employee();  System.out.println("Employee Details02");  System.out.println("Employee ID: "+empObject02.getEmployeeID());  System.out.println("Name: " + empObject02.getFirstName() +" "+ empObject02.getLastName());  System.out.println("Address: "+ empObject02.getAddress());  System.out.println("Contact Number: "+empObject02.getPhoneNumber());  System.out.println("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n");  // now set the value of attributes for the empObject02  empObject02.setEmployeeID(12354);  empObject02.setFirstName("Jaden");  empObject02.setLastName("Smith");  empObject02.setPhoneNumber("9494949494");  empObject02.setAddress("1231 University Drive, Apt#60, Kansas, MO");  System.out.println("Testing toString() method of Employee class:\n"+empObject02.toString()); |

1. Using the above Driver class code, explain why **empObj02** prints all Employee details as null for **String** and 0 for **Int** type instance variables. Demonstrate the explanation using comments. Verify your output with below given sample output.
2. Create a new Java Class in **employee** package and name it as **EmployeeSalary**.
3. Write statements to declare the following attributes. Do not add any instance variables beyond those shown here.

**Note**: Access specifiers must be private for all the given instance variables.

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| **Attributes** | **Type** | **Attribute Description** |
| **hourlyRate** | **double** | Hourly pay rate of the employee |
| **Bonus** | **double** | Bonus amount per annum |
| **insuranceRate** | **double** | Insurance percentage |
| **taxRate** | **double** | Tax percentage |
| **HOURS** | **int** | Total hours of work per week(constant), initialize with 30 |

1. Constructor:
   1. Create one constructor with parameters, with the following prototype. The parameters are used to set the values of the instance variables.

**public EmployeeSalary(double hourlyRate, double bonus, double insuranceRate, double taxRate)**

* 1. Create one no-argument constructor .

1. Methods:
   1. Write a get() and set() method for each of the instance variables declared. The set() methods do not return any value. The get() methods return the same type which is used for declaring the attributes. Use the standard naming convention.
   2. Write a method for calculating the monthly salary of the employee. Name the method as monthlySalary(). It must return a double value.

**Hint:**

* Calculate based on number of weekly hours provided.
* Assume there are 4 weeks in a month.

***If the hourly pay rate of the employee is $30.5, and then his/her monthly salary should be $3660.0.***

* 1. Write a method for calculating the monthly insurance. Name the method as monthlyInsurance(). It must return a double value.

**Hint:**

* Calculate based on number of weekly hours provided.
* Assume there are 4 weeks in a month.

***If the hourly pay rate of the employee is $30.5, insurance is 12.2%, and then his/her monthly insurance should be $446.52.***

* 1. Write a method for calculating the annual salary. Name the method as **annualGrossSalary()**. It must return a double value.

***If the hourly pay rate of the employee is $30.5, annual bonus added to his annual income is 4450.7 and then his annual salary should be $*** ***48370.7***

* 1. Write a method for calculating the annual net pay. Name the method as **annualNetPay().** It must return a double value. Assume the miscellaneous deduction is 3.2% annually.

***If the hourly pay rate of the employee is $30.5, tax exempted is 15.0%, on annualGrossSalary, insurance deducted is 12.2% on his annual salary then his annual Net pay should be $*** ***34208.992600000005***

* 1. Write a toString() method which should be used to display the values for each attribute. This method should return a String. Please see the sample output for knowing the pattern.

1. Include Javadoc comments for each constructor, and method in **Employee** and **EmployeeSalary** class using **@author**, **@param**, and **@return** annotations when appropriate. Remember that for each method, the first line of the Javadoc comment should be a brief description of the method.
2. Generate documentation for your project by clicking on **Run** from the NetBeans menu bar and then selecting **Generate Javadoc**. The documentation will be placed in a **javadoc** subfolder of the **dist** subfolder inside your project folder. You can view the documentation created by opening **index.html**.
3. Go to **EmployeeDriver** class in **employees** package. Now do the following at the end of the same main function.
   1. Declare and initialize a Scanner object to read from the keyboard. Name it as **sc**.
   2. Prompt the values for hourlyRate, insuranceRate, taxRate, and bonus for a Employee. Read each value using the Scanner object created in the previous step.
   3. Use the input values to create a new EmployeeSalary object named **EmployeeSalaryObj1**
   4. Print EmployeeSalaryObj1 using toString() method in EmployeeSalary class.
   5. Print with appropriate labels, the values returned by monthlySalary(),monthlyInsurance(),annualGrossSalary(),annualNetPay().
   6. Create a new EmployeeSalary object and name it as **EmployeeSalaryObj2** using the no argument constructor.
   7. Print EmployeeSalaryObj2 using toString() method in EmployeeSalary class.
   8. Print with appropriate labels, the values returned by monthlySalary(),monthlyInsurance(),annualGrossSalary(),annualNetPay().
   9. Use the setter methods to set the values for hourlyRate, insuranceRate, taxRate, and bonus for a Employee as $ 56.72, 18.40%, 9.65% and $8463.77respectively. Do not input these values, hard code them as parameters in the calls to the setter methods.
   10. Print EmployeeSalaryObj2 using toString() method in EmployeeSalary class.
   11. Print with appropriate labels, the values returned by monthlySalary(),monthlyInsurance(),annualGrossSalary(),annualNetPay().

Sample Output: (User input is in Red)

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| Employee Details01  Employee ID: 34562  Name: Lousie Adams  Address: 9277 Fairway Drive, Apt#208, Des Plaines, IL  Contact Number: 6602240486  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  Employee Details02  Employee ID: 0  Name: null null  Address: null  Contact Number: null  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  Testing toString() method of Employee class:  Jaden Smith with employeeID: 12354 , phone number: 9494949494 and address: 1231 University Drive, Apt#60, Kansas, MO  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  Testing the EmployeeSalary class:  Enter the hourly pay rate of the Employee : $30.5  Enter the insurance rate of the Employee in percentage:12.2  Enter the tax rate of the Employee in percentage:15.0  Enter the bonus amount:$ 4450.7  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  Testing the tostring() method of EmployeeSalary class :  Hourly pay rate:$30.5, insurance rate:12.2%, tax:15.0%, annual bonus:$4450.7, Hours per week: 30  The monthly salary of the Employee is:$3660.0  The monthly insurance of the Employee is:$446.52  The annual gross salary of the Employee is:$48370.7  The gross annual net pay of the Employee is:$34208.992600000005  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  The details of the EmployeeSalaryObj2 are as follows:  Testing the toString() method of EmployeeSalary class :  Hourly pay rate:$0.0, insurance rate:0.0%, tax:0.0%, annual bonus:$0.0, Hours per week: 30  The monthly salary of the Employee is:$0.0  The monthly insurance of the Employee is:$0.0  The annual gross salary of the Employee is:$0.0  The gross annual net pay of the Employee is:$0.0  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  Testing the toString() method of EmployeeSalary class :  Hourly pay rate:$56.72, insurance rate:18.4%, tax:9.65%, annual bonus:$8463.77, Hours per week: 30  The monthly salary of the Employee is:$6806.4  The monthly insurance of the Employee is:$1252.3775999999998  The annual gross salary of the Employee is:$90140.56999999999  The gross annual net pay of the Employee is:$63528.975555 |

**Submit you solution by following the steps below:**

* Save your files in NetBeans.
* Zip your entire Project. (It should be called *Lastname*\_Lab02Classes.zip where Last name is your last name.)
* Submit the Zip file to the Lab02Classes dropbox.
* Download the Zip file you have submitted.
* Look in the Zip file and verify the class files in the Zip folder are correct. If not resave your project in NetBeans and resubmit.