



**Subject of Experiment:** Inheritance

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## PROBLEM:

What is expected from us in this experiment is to create a system to calculate salaries of Personnel who is working in a governmental institution. We need to read inputs from files and calculates each personnel's salary.

## SOFTWARE USAGE:

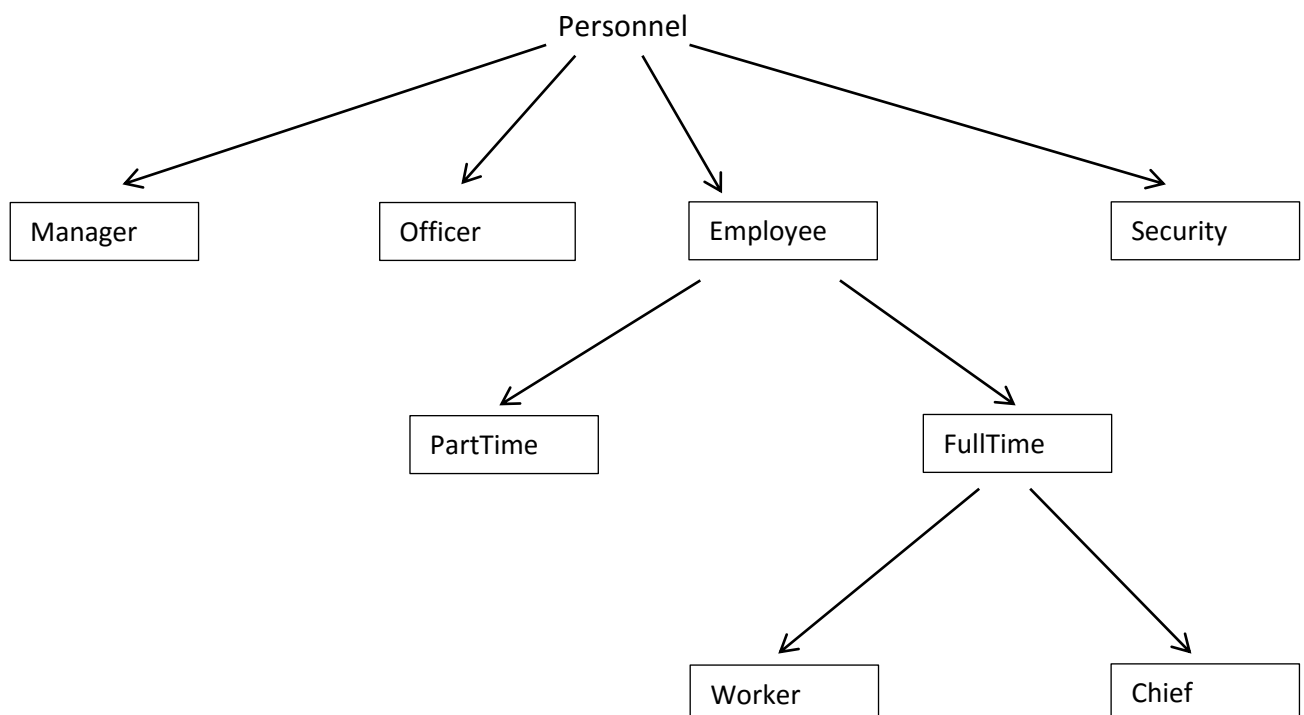
In this experiment, the program takes two arguments which are input files from command line. I use twelve classes to implement my algorithm. The output will be written to files for each given input.

## SOLUTIONS:

In the beginning of the experiment, I created twelve classes. First one is *Main.java* class where program reads files and split them into arrays.

After *Main.java* class, I created *ReadFile.java* which has open and close the file operations and *WriteFile.java* which has open output files and execute writing operations.

Then, I created nine more classes and in this classes, I calculate salary of employees. For more efficient solution, I use inheritance between these classes. My inheritance structure is given below:



## ALGORITHM:

**1. Reading File:** First, I declare an ArrayList named *personnel* which is type of *Personnel*. Then I read *Personnel.txt* from argument line and split it until tab. But first element of array separated by a space so I split first element of array until space thus, I have *name* and *surname*. After split operations I controled my inputs looking at the position and if it found right positon, I add into *personnel* arraylist as new object which created from *Manager*, *Officer*, *Security*, *PartTime*, *Worker* or *Chief* classes.

After finished reading *Personnel.txt*, I start to read *Monitoring.txt*. *personnel*'s registration number and working hours for four weeks are given us in this file. I use *Scanner* class to read file. Then split them until tab. Before searching personnels up to registration numbers, I create a new array for working hours and assign what I read from file. Then in a for loop I search *personnel* which has given registration number. After I find the right *personnel* calculate its salary and write it on a file.

**2. Writing File:** It is expected from us to create a new *txt* file for each *personnel* which is given from input file. So I create a new object from *WriteFile.java* class in the *for* loop for I use searching operation.

I override *toString(Personnel personnel, int[] hourPerWeek, int year)* method for every class. In *toString* method I implement output format. Then I call this method at *Main* class and I send into *write(String str)* method which created output file object before. And outpu be like:

```
Name : ERDEM
Surname : YILMAZ
Registration Number : M5632
Position : MANAGER
Year of Start : 2003
Total Salary : 4598,00 TL
```

**3. Calculate Salary:** For calculate salary of each *personnel*, I write *calculateSalary(int[] hourPerWeek, int year)* method and override it in *Manager*, *Officer*, *Security*, *PartTime*, *Worker* and *Chief* classes. *Manager*, *Officer*, *Worker* and *Chief* has over work salary. So I write another method for calculate over work salary such as *calculateOverWorkSalary(int[] hourPerWeek)*. In this method I control maximum and minimum over working hours and calculate the money. Then call it in *calculateSalary* method which is return total salary. *Security* and *PartTime* get paid by working hour. Besides *Security* has transportation and food money to add total salary. Except *PartTime* every *personnel* has severance pay. It is calculate like this:

$$(\text{current year} - \text{year of start}) * 20 * 0,8 = X \text{ TL}$$

I take current year as 2016 and implement this in *calculateSalary* methods.

#### **REFERENCES:**

<http://stackoverflow.com/>

<http://docs.oracle.com/javase/7/docs/index.html>

<http://www.tutorialspoint.com/java/>