

## Exercise 2:

*Summary:* We implement a code framework that allows us to set up a company and assign employees to it. Employees can be directors or workers. Each worker is assigned to one director. The company keeps track of the employees, their salaries and the taxes they pay. We create the employees via input from the console.

### Task 1: Implement Employee (2 points):

*theName* is the name of the employee.

*profession* is either "Worker" or "Director".

*salary* is the annual salary of the worker.

*allocatedDirector* stores the address of the director.

The constructor initializes *theName*, *profession* and *salary* and sets *allocatedDirector* to *null*.

Employee
-theName : String
-profession : String
-salary : double
-allocatedDirector : Employee
+Employee(String, String, double)
+getProfession() : String
+getAllocation() : Employee
+setAllocation(Employee) : void
+getName() : String
+getSalary() : double
+toString() : String

*getProfession()* returns the value of *profession*, *getName()* that of *theName* and *getSalary()* that of *salary*.

A "Worker" is allocated to a "Director". *setAllocation(arg)* copies the address of the director *arg* into *allocatedDirector* if the employee is a worker and *getAllocation()* returns the address stored in *allocatedDirector*.

*toString()* returns the text string starting with "Employee's details : " followed by its name, profession and salary.

### Task 2: Implement Company (3 points):

*theList* contains all employees of the company (workers and directors).

The constructor initializes *theList*.

*addEmployee(arg)* adds the employee *arg* to *theList*.

Company
-theList : ArrayList<Employee>
+Company()
+addEmployee(Employee) : void
+availableWorkers() : ArrayList<Employee>
+getTaxes() : double
+getDirector(String) : Employee
+toString() : String

*getDirector(arg)* returns the director with the name *arg* if s/he exists.

*availableWorkers()* returns a list of all workers that have not yet been assigned to a director.

*getTaxes()* returns the sum of the taxes paid by all employees of the company. Salaries are taxed by 25%. The bonus of each director equals 10% of the sum of the salaries of all the workers that are assigned to it. The tax rate for the bonus is 25%.

*toString()* returns the string "Company information : " followed by the new line "Number of employees" followed by this number and followed by the new line "Total taxes paid : " followed by the taxes paid by all employees.

### **Task 3: Implement Exercise (5 points):**

Implement a loop in *main* that creates new employees and adds them to the company's list of employees. The loop should be terminated by typing "end".

A second loop connects the workers and the directors.

This loop should stop once all workers have been assigned to a director. The loop asks for the name of a director. If it finds this director then it gets the list of all workers that have not yet been assigned to a director. The names of the workers are printed on the console together with a unique integer number. Selecting a number adds the worker with this number to the director and prints the details of this employee to the console. This loop is terminated once all workers have been assigned to a director.

Finally the return value of the method *toString()* of the company is printed to the console.