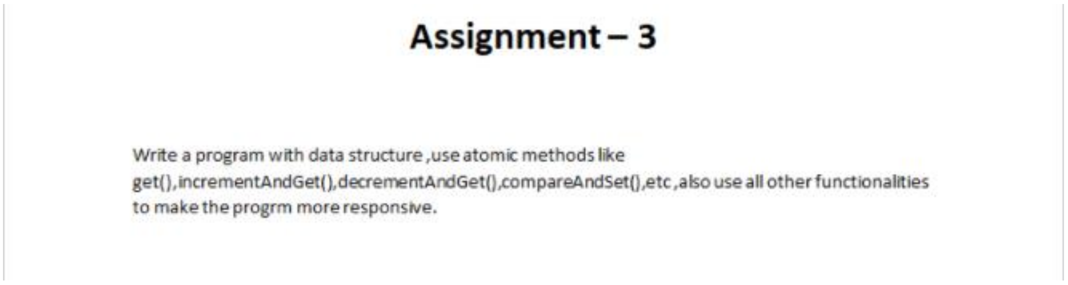
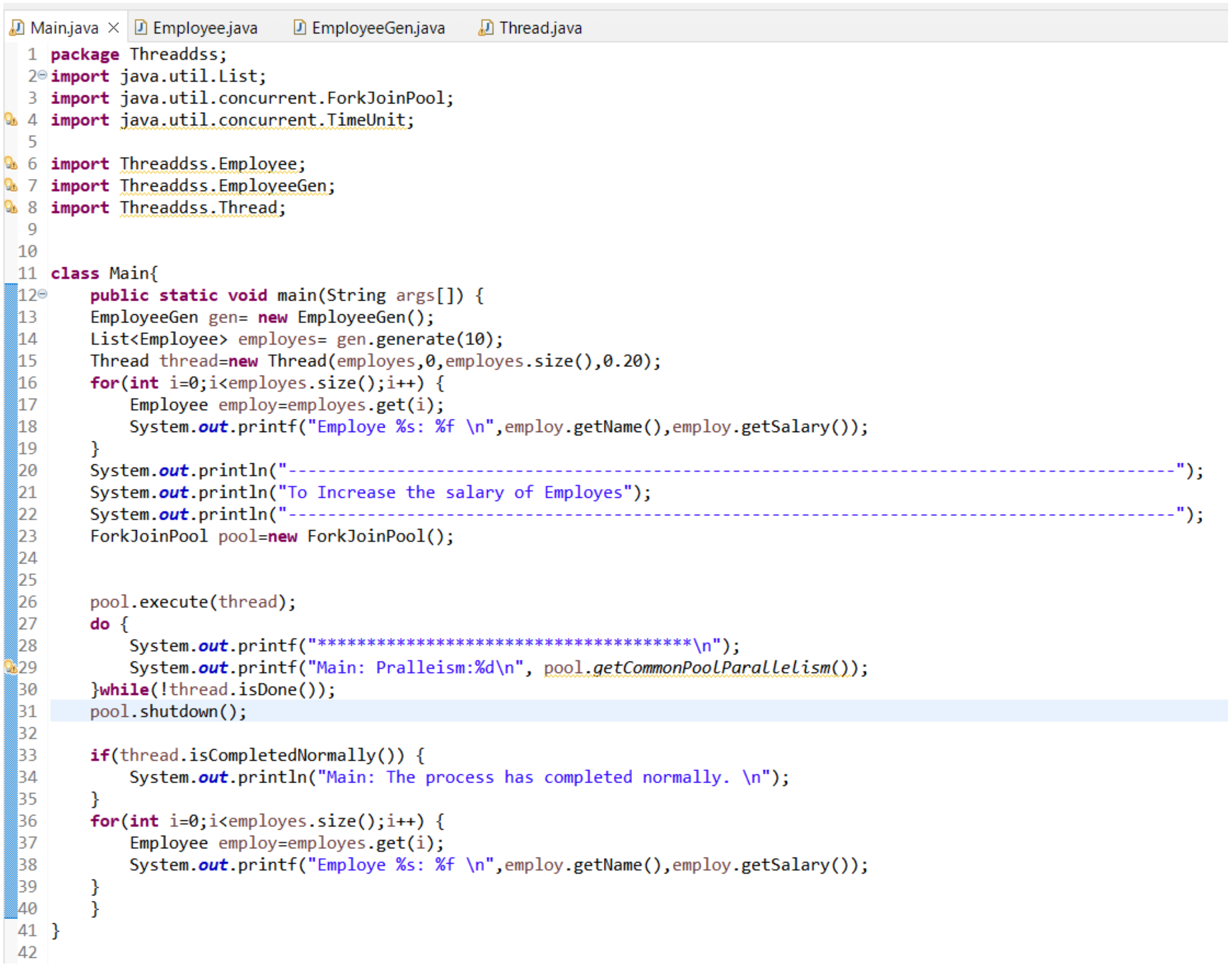
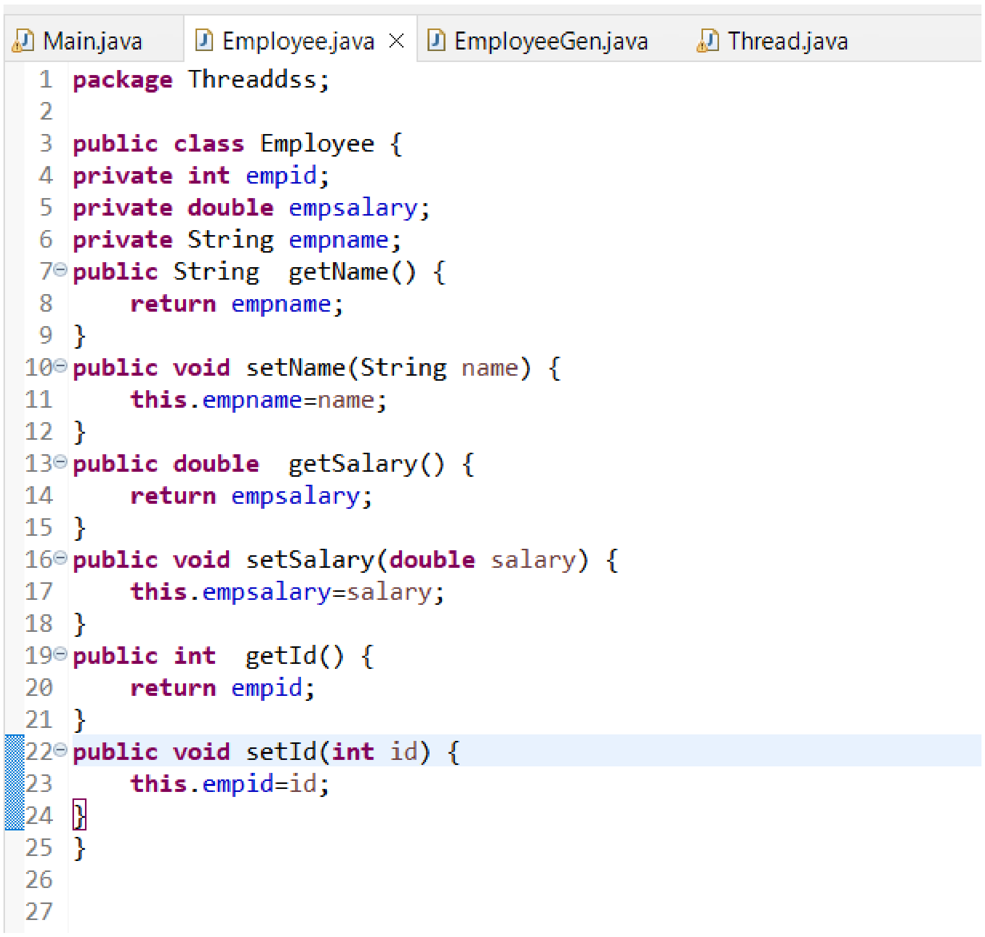


Assignment – 3

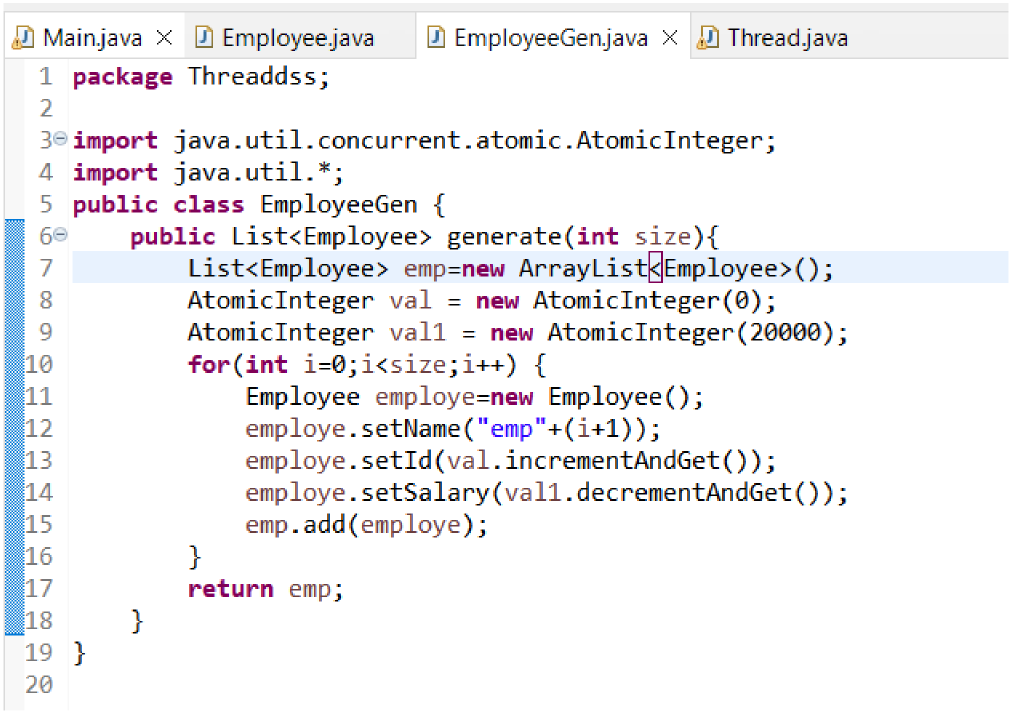
Write a program with data structure ,use atomic methods like get(),incrementAndGet(),decrementAndGet(),compareAndSet(),etc ,also use all other functionalities to make the progrm more responsive.



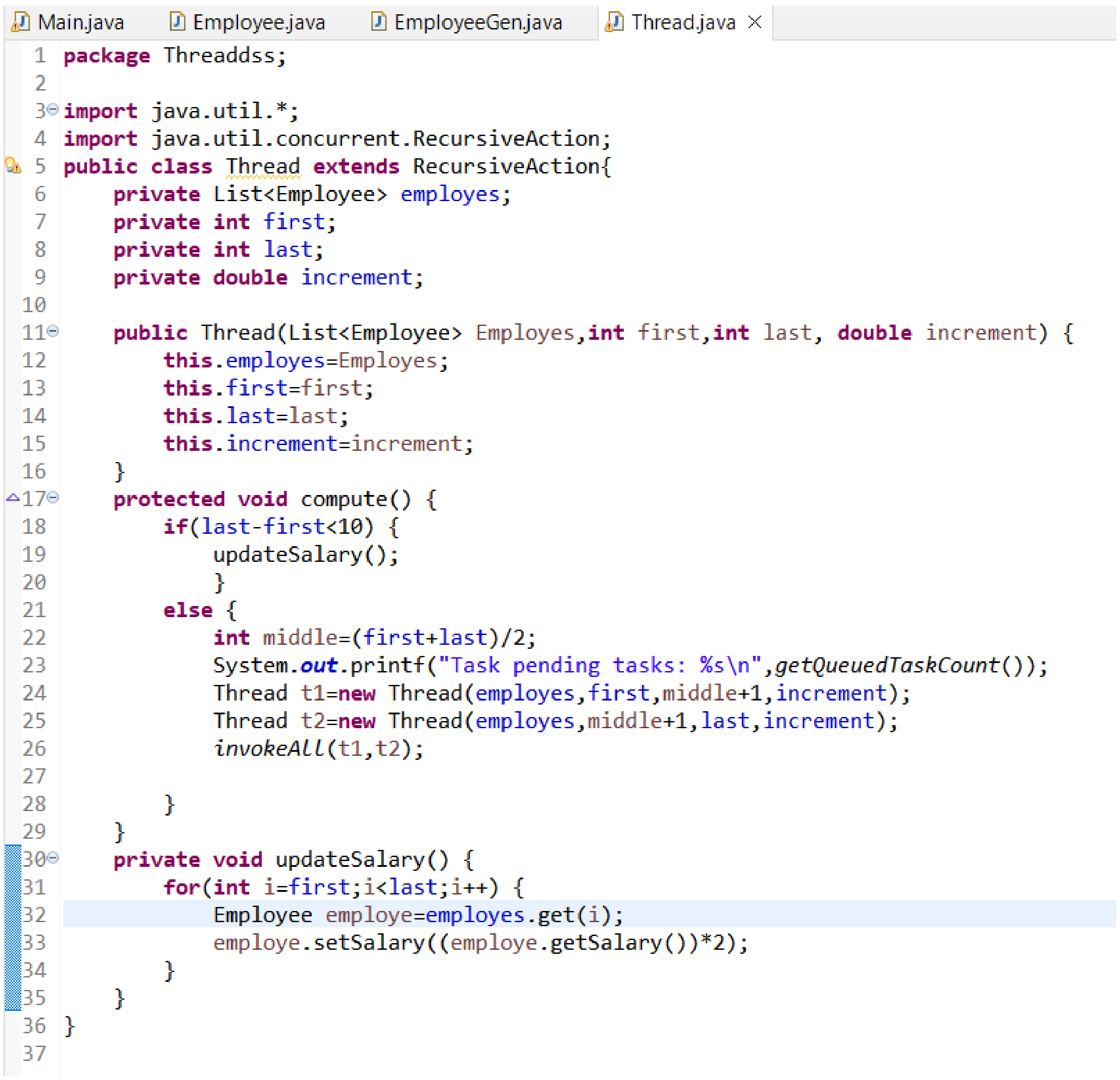
```java
package Threaddss;
import java.util.List;
import java.util.concurrent.ForkJoinPool;
import java.util.concurrent.TimeUnit;

import Threaddss.Employee;
import Threaddss.EmployeeGen;
import Threaddss.Thread;


class Main{
    public static void main(String args[]) {
    EmployeeGen gen= new EmployeeGen();
    List<Employee> employes= gen.generate(10);
    Thread thread=new Thread(employes,0,employes.size(),0.20);
    for(int i=0;i<employes.size();i++) {
        Employee employ=employes.get(i);
        System.out.printf("Employe %s: %f \n",employ.getName(),employ.getSalary());
    }
    System.out.println("------------------------------------------------------------------------------------------");
    System.out.println("To Increase the salary of Employes");
    System.out.println("------------------------------------------------------------------------------------------");
    ForkJoinPool pool=new ForkJoinPool();


    pool.execute(thread);
    do {
        System.out.printf("**************************************\n");
        System.out.printf("Main: Pralleism:%d\n", pool.getCommonPoolParallelism());
    }while(!thread.isDone());
    pool.shutdown();

    if(thread.isCompletedNormally()) {
        System.out.println("Main: The process has completed normally. \n");
    }
    for(int i=0;i<employes.size();i++) {
        Employee employ=employes.get(i);
        System.out.printf("Employe %s: %f \n",employ.getName(),employ.getSalary());
    }
    }
}
```



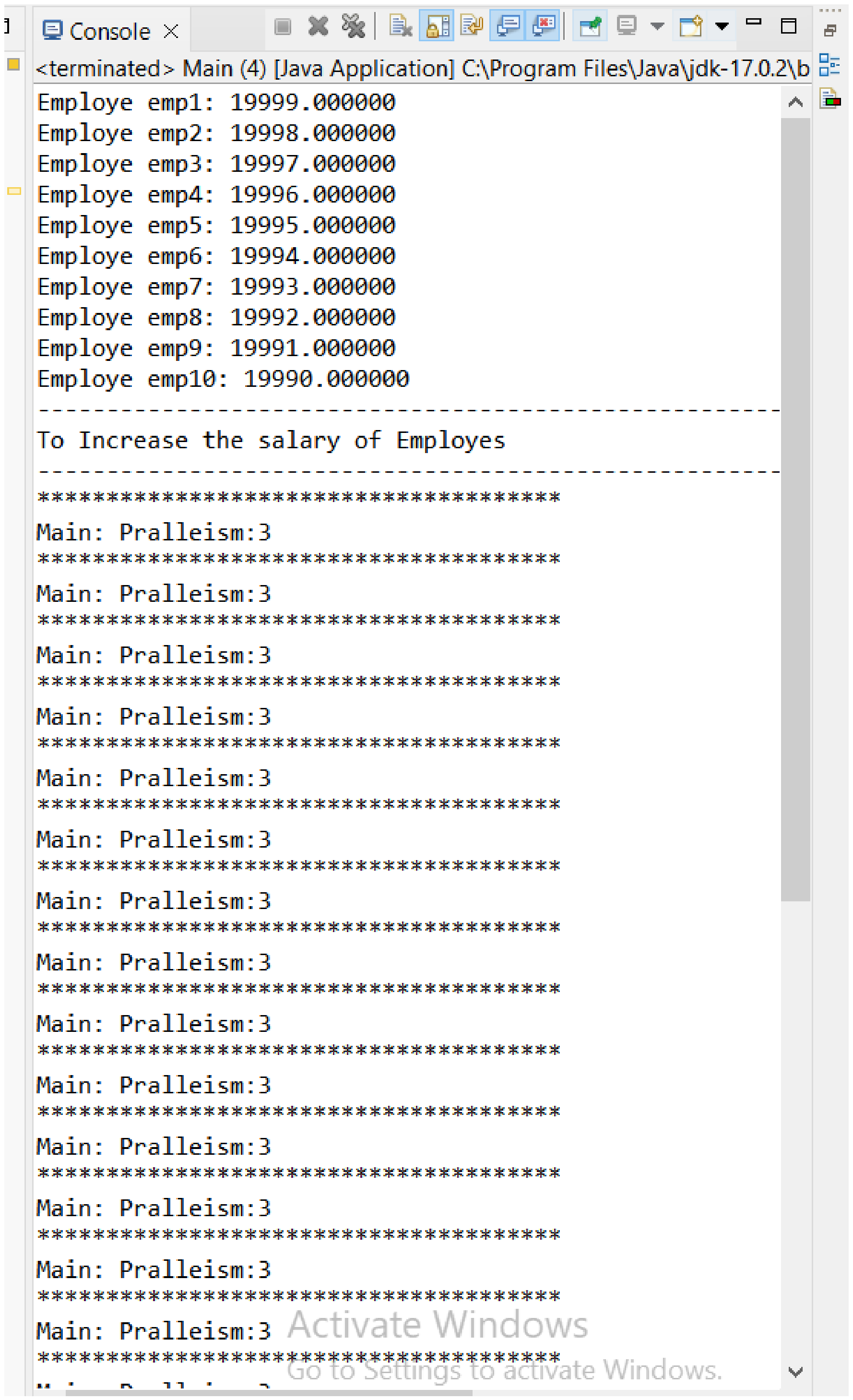
```java
package Threaddss;

public class Employee {
private int empid;
private double empsalary;
private String empname;
public String  getName() {
    return empname;
}
public void setName(String name) {
    this.empname=name;
}
public double  getSalary() {
    return empsalary;
}
public void setSalary(double salary) {
    this.empsalary=salary;
}
public int  getId() {
    return empid;
}
public void setId(int id) {
    this.empid=id;
}
}


```



```java
package Threaddss;

import java.util.concurrent.atomic.AtomicInteger;
import java.util.*;
public class EmployeeGen {
    public List<Employee> generate(int size){
        List<Employee> emp=new ArrayList<Employee>();
        AtomicInteger val = new AtomicInteger(0);
        AtomicInteger val1 = new AtomicInteger(20000);
        for(int i=0;i<size;i++) {
            Employee employe=new Employee();
            employe.setName("emp"+(i+1));
            employe.setId(val.incrementAndGet());
            employe.setSalary(val1.decrementAndGet());
            emp.add(employe);
        }
        return emp;
    }
}

```



```java
package Threaddss;

import java.util.*;
import java.util.concurrent.RecursiveAction;
public class Thread extends RecursiveAction{
    private List<Employee> employes;
    private int first;
    private int last;
    private double increment;

    public Thread(List<Employee> Employes,int first,int last, double increment) {
        this.employes=Employes;
        this.first=first;
        this.last=last;
        this.increment=increment;
    }
    protected void compute() {
        if(last-first<10) {
            updateSalary();
            }
        else {
            int middle=(first+last)/2;
            System.out.printf("Task pending tasks: %s\n",getQueuedTaskCount());
            Thread t1=new Thread(employes,first,middle+1,increment);
            Thread t2=new Thread(employes,middle+1,last,increment);
            invokeAll(t1,t2);

        }
    }
    private void updateSalary() {
        for(int i=first;i<last;i++) {
            Employee employe=employes.get(i);
            employe.setSalary((employe.getSalary())*2);
        }
    }
}

```



Console

<terminated> Main (4) [Java Application] C:\Program Files\Java\jdk-17.0.2\b

```
Employe emp1: 19999.000000
Employe emp2: 19998.000000
Employe emp3: 19997.000000
Employe emp4: 19996.000000
Employe emp5: 19995.000000
Employe emp6: 19994.000000
Employe emp7: 19993.000000
Employe emp8: 19992.000000
Employe emp9: 19991.000000
Employe emp10: 19990.000000
-----------------------------------------------------
To Increase the salary of Employes
-----------------------------------------------------
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
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Main: Pralleism:3
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Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
```

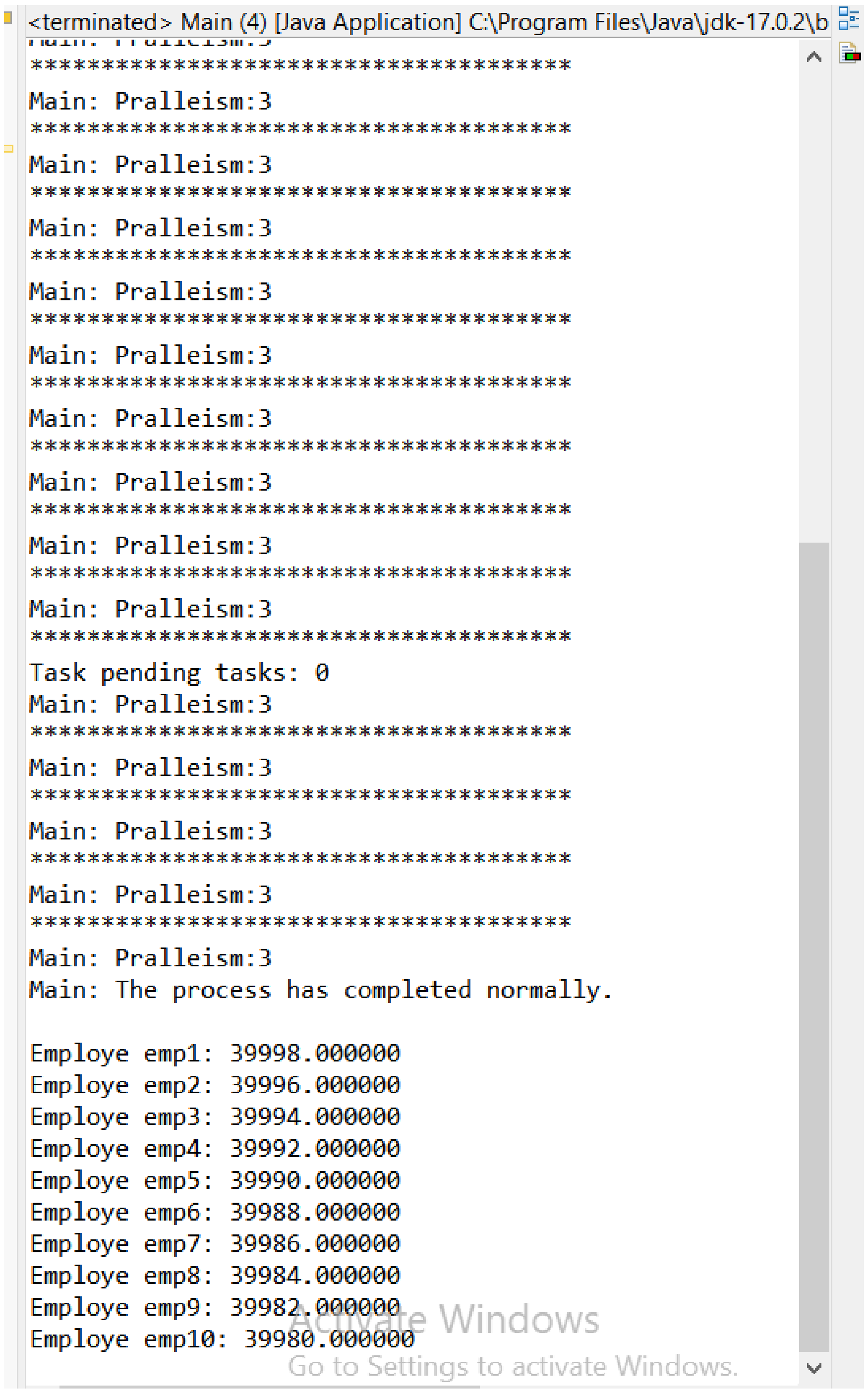

```
<terminated> Main (4) [Java Application] C:\Program Files\Java\jdk-17.0.2\b
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Task pending tasks: 0
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
**************************************
Main: Pralleism:3
Main: The process has completed normally.

Employe emp1: 39998.000000
Employe emp2: 39996.000000
Employe emp3: 39994.000000
Employe emp4: 39992.000000
Employe emp5: 39990.000000
Employe emp6: 39988.000000
Employe emp7: 39986.000000
Employe emp8: 39984.000000
Employe emp9: 39982.000000
Employe emp10: 39980.000000
```