5COSC001W - Tutorial 9 Exercises

1 Activity Diagrams

Which of the following pseudocode implements the activity diagram shown in Figure 1?

- ```
  if (OK) then
     do C
  else
     do A OR B //not both
  do D
  ```
- ```
  If (OK) then
     do C
  else
     do A and B //either order
  do D
  ```
- ```
  if (OK) {
     do C
     do A and B
     do D
  }
  ```
- ```
  if (OK) then
     do C
  else {
     do A
     do B
  }
  do D
  ```

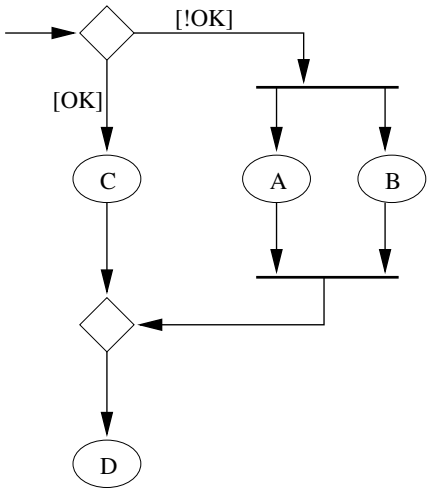

Figure 1: The activity diagram for Question 1.

2 Collaboration Diagrams

Draw the UML collaboration diagram corresponding to the UML sequence diagram shown in Figure 2.

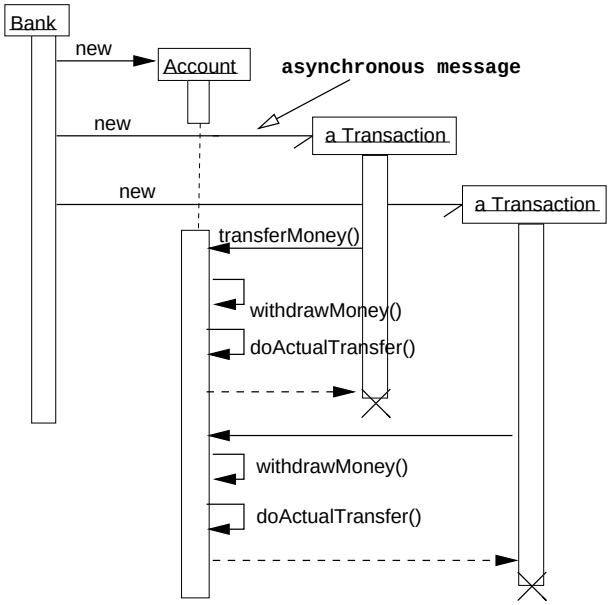

Figure 2: Question 2.

3 Sequence Diagrams

Draw a UML sequence diagram for the following Java code:

```
public class Professor {
    int students_handed_homework = 0;

    public void doWork() throws Exception {
        Student student1 = new Student(this);
        Student student2 = new Student(this);
        student1.start();
        student2.start();

        while (students_handed_homework < 2)
            Thread.sleep(1000);
        System.out.println("Professor finished so
                            going sabbatical!");
    }

    public synchronized void handHomework() {
        ++students_handed_homework;
    }

    public static void main(String[] args) throws Exception {
        Professor prof = new Professor();
        prof.doWork();
    }
}


class Student extends Thread {
    Professor professor;

    public Student(Professor prof) {
        professor = prof;
    }

    public void run() {
        attendLecture();
        Homework coursework = new Homework();
        coursework.doIt();
        professor.handHomework();
    }

    public void attendLecture() {
        System.out.println("Student is attending a lecture");
    }
}
```

```
class Homework {
    public void doIt() {
        System.out.println("Homework done!");
    }
}
```

4 Sequence Diagrams

Write a Java multithreaded program which corresponds to the UML sequence diagram shown in Figure 3.

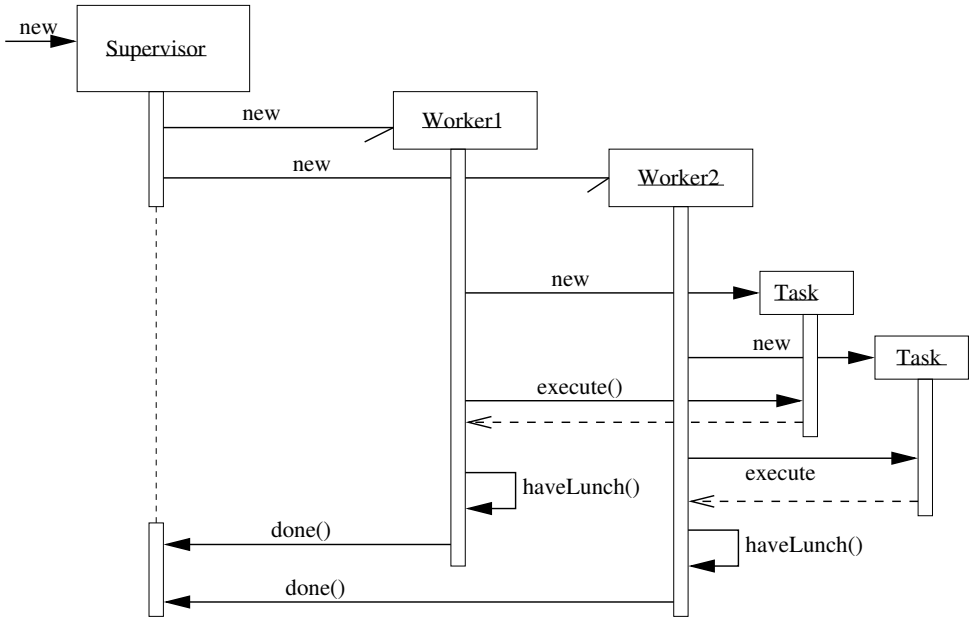

Figure 3: Question 4

5 Class Diagrams

Draw a UML class diagram for the following scenario:

An online company accepts orders placed by customers. An order includes a date and a status (fulfilled, in progress, etc). The details of an order include a product id and the quantity. A customer can place orders to more than one company. A company must receive a payment for an order before processing it. Each company is located in a city and it has a specific address with a postcode, a telephone number and an customer care email address.

You should appropriate methods in each class which seem necessary for the implementation of the problem.