

Name and Surname(s):

- This test **must** be recorded with **OBS**.
- The **only** internet access that you can have is the **MUdle** page of this course.
- Any content in the **MUdle** page of this course **can** be used.
- You can **not** use any exercise stored in your computer.
- You must upload **3 files** named `tram.zip`, `fishshop.zip` and `kindergarten.zip`.
- The exercises must be solved with monitors. You can not implement a semaphore with monitors and solve it with semaphores.

1. **Tram** (3 points). There is an intersection where both trams and cars can enter. At that intersection,
 - (a) any number of cars can enter simultaneously.
 - (b) trams must have exclusive access (once a tram enters the section no other trams or cars can enter).
 - (c) once the tram arrives, cars already in the intersection can finish, but the new ones must wait.

Modify the code in `tram.zip` to regulate this intersection.

2. **Fish Shop** (4 points). Recently, a fish shop has implemented a turn-o-matic system. With this system, the customer who arrives first is the first to be attended (FIFO). When a customer arrives, he/she takes a numbered ticket from a `ticketDispenser`, and waits until this number is displayed on the `turnDisplay`. When his/her number is displayed he/she will be attended by the fishmonger. The fishmonger will wait for the customer to be ready, and then start serving. Once the fishmonger finishes, he/she will notify the customer and wait for him/her to leave, creating the following sequence:

```
...
Customer 2 has taken ticket #18
...
Display shows now turn #18
    Fishmonger waiting client
    Customer 2 is going to be served
    Fishmonger serving
    Fishmonger serving done
        Customer 2 goes
...
```

Finally, the fishmonger will update the `turnDisplay` and begin serving the next customer. Modify the code in `fishshop.zip` to recreate this behavior.

3. **Kindergarten** (3 points) At a child care center, state regulations require that there is always one adult present for every three children. When a adult enters, he/she waits until there are three children waiting. Then, the adult notifies these three children that they may enter. The children can leave at any time. When three children leave and an adult is not required, he/she also leaves.

Modify the code in `kindergarten.zip` to enforce this constraints in a critical section.