Concurrent Programming Languages

Channel-based Concurrency Module
Lab 2: Mini-Project

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MIEI - Integrated Masters in Comp. Science and Informatics
Specialization Block

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NOVALINCS

Course Infrastructure

- We are going to use GitHub Classroom to the mini-project
- Today's **graded** assignment (teams of 2) is available here:

  https://classroom.github.com/a/esDzec9i

- Sign up, teams of 2 people.
- Deadline on 25/10/2020 23:59. Have fun.

Feeding the Dog

A producer-consumer scenario:

- Alice has a dog in her house with access to a yard.
- Alice buys dog food online and has it delivered to the yard.
- The dog and the delivery person cannot be simultaneously in the yard.

Feeding the Dog

Agreed upon protocol:

- Alice puts a flag in the yard, initially up.
- When the flag is up, the dog is not in the yard.
- Delivery person makes the delivery when the flag is up, and puts it down when leaving the yard.
- When Alice sees the flag is down, gets the food and lets the dog out.
- When Alice runs out of dog food, locks the dog and puts the flag up.

Feeding the Dog

Task 1

- An implementation of the protocol between Alice and the delivery person.
- No locks.
- At least 2 (non-main) goroutines: one for Alice, another for the delivery person.
- Helpful if goroutines log their “state”.
- Convenient if you put your goroutines to sleep for some amount of time (e.g. to model the time between letting the dog out and running out of food).
- A small report that answers what properties your implementation ensures or not.

Two Dogs

A mutual exclusion scenario:

- Alice and Bob both have dogs.
- Bob lives in a separate house, facing Alice's house and sharing the yard.
- The dogs don’t get along so they cannot be together in the yard, but both need to access it.

Two Dogs

Agreed upon protocol:

- Both Alice and Bob put up a flag on their windows, initially down.
- When of them wants to release their pet, both flags must be down.
- When a pet is released, the flag of its house is first put up.
- When the pet returns, the flag of its house is put down.

The flags indicate whose dog is entitled to be in the yard, which means that **at most one flag** should be up at any given time.

Two Dogs

Task 2

- An implementation of the protocol between Alice and Bob.
- At least 4 (non-main) goroutines: Alice, Bob and the two dogs.
- The code for each dog must be identical.
- The code for each person must be identical.
- A small report regarding the underspecified aspects of the protocol and its properties.
- What happens if we can make the code for each person different? (report + code)