Practice Exam 2022 9 of May.

Due No Due Date **Points** 5 **Submitting** a file upload **File Types** zip and c
Available May 9 at 3pm - May 9 at 4:30pm about 2 hours

This assignment was locked May 9 at 4:30pm.

Solve the following problem in C, which can run on a Linux system (this can be the object server (opsys.inf.elte.hu) or your own local Linux system!) Upload the result (only the C source file, e.g. alma.c) after 1.5 hours after the start at the most. The results will be evaluated by the tutors and the result will be recorded in Canvas.

The result of the essay is satisfactory if the first task is done, 3 if the first two are done, etc.

Easter has passed and the winner of the Easter watering competition will take over and become the new "Chief Bunny". As he walks through his kingdom, he sees the "fruits" of spring running merrily through the freshly planted borders. He decides to have a "bunny count".

1. "Chief Bunny" (parent) does not take a full census, full count, he simple chooses two areas from "North", "East", "South" and "West" teritory, where he sends a bunny counting commissioner (child). Chief Bunny invites the bunny counting commissioners, Tapsi and Hapsi (child) and waits until the commissioners are ready for the task, which is acknowledged by an any signal (arbitrary). Once the Chief Bunny has received the signals, he forwards to both Counting Commissioners(Tapsi and Hapsi) the selected area name to be surveyed by message queue. Both Tapsi and Hapsi read the name of the area from message queue and write it to the screen. Then they finish their activity for the day (child processes exit), which is waited by Chief Bunny, who writes on the screen that both Tapsi and Hapsi are going to rest, and Chief Bunny also exit.

2. The results of bonny counting (random numbers between 50 and 100) are also sent back to Chief Bunny via a message queue, who writes them on the screen. Chief Bunny has the results of the previous bunny count (random number between 50 and 100 for each area), so he immediately compares whether there has been a bunny loss or gain in the area, and writes the results on the screen(e.g. There is a bonny loss in "North".)

3. If there has been a bunny loss in the area, Chief Bunny sends a "Search_more" signal, otherwise he sends a "Home" signal to Tapsi and Hapsi. If Tapsi or Hapsi receives a "Home" signal, they stop their activity, if they receive a "Search_more" signal, they go around the area again and send back the result of the new count (random number between 70 and 100) on a message queue as well, which Chief Bunny writes to the screen

4. Chief Bunny writes the results of the two area samples to both the shared memory and the screen, and uses them to determine whether there has been a population decrease or increase in the bunny count. Protect writes to shared memory with semaphore.