JACOBS UNIVERSITY BREMEN
BACHELOR OF COMPUTER SCIENCE

OS 2022 Problem Sheet #4

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Course: *CO-562 Operating Systems* – Professor: *Dr. Jurgen Schonwalder*
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Problem 4.1: ***multi-threaded 100 prisoners problemreaders / writers problem***

The 100 prisoners problem is stated by Philippe Flajolet and Robert Sedgewick as follows:
The director of a prison offers 100 death row prisoners, who are numbered from 1 to 100, a last chance. A room contains a cupboard with 100 drawers. The director randomly puts one prisoner's number in each closed drawer. The prisoners enter the room, one after another. Each prisoner may open and look into 50 drawers in any order. The drawers are closed again afterwards. If, during this search, every prisoner finds his number in one of the drawers, all prisoners are pardoned. If just one prisoner does not find his number, all prisoners die. Before the first prisoner enters the room, the prisoners may discuss strategy — but may not communicate once the first prisoner enters to look in the drawers. What is the prisoners' best strategy?
Submit the times you measured. What do you observe?

Answer. Overall method strategy has a lower performance than method random.

```
$ ./prisoner
0/100 wins method random_global 412.890 ms
0/100 wins method random_drawer 412.300 ms
0/100 wins method strategy_global 464.867 ms
0/100 wins method strategy_drawer 413.502 ms
```