Unix System

Rice-eating philosophers

Contents

Administrative details

- Your sources shall be turned-in on the `PSU_year_philo` directory
  ex: PSU_2013_philo for the 2013-2014 scolar year
- Your binary shall be compiled using a Makefile.
- The binary's name shall be `philo`.
- The binary must be placed in your repo's root directory.
- The project must be carried out as a team of two students.

Subject

A group of philosophers has decided to start a new theory, dictating a group of rules about sharing natural resources that prevents famishment around the world.

Before the release of those rule, they decided testing it in a simulator. They hired you to carry through this simulator and finally showing the whole world their infinite wisdom.

On your shoulders is a huge responsibility : proving that your new friends have resolved the famishment problem. In order to avoid the stress linked to the amount of risk of this mission, you'll have to do this project by group of two persons.

The simulator will have to respond to these requirements :

- N philosophers are around one table (N is defined on the command line).
- Each philosopher has one rice bowl in front of him.
- There is a chopstick at the left of each bowl.
- A philosopher can only use a chopstick if it is at the left or at the right of his bowl.
- A philosopher goes through three steps :
  - Eats with two chopsticks. One left and one right.
  - Rests, does not use any chopstick, even if one is available.
  - Thinks, uses one and only one chopstick.

And beyond that there are a few more rules to guarantee a better digestion - it is really important for them to be healthy, and a better assimilation of nutritious elements of the rice - and that's the real solution about abolition of famishement... but you have to keep the secret ! :

- A philosopher that thinks must eat before resting. In order to get his energy back, obviously.
- After resting, a philosopher can either eat, or think.
- The states "think" and "eat" have a maximum duration that you'll have to determine.
- A chopstick cannot be used by two philosophers at the same time, for hygienic reasons, they said.

So you have to create this simulator, defining yourself a few confines (execution time of actions, resources usage quota, program execution time...).

Obviously, each resource can be used only by one person at the same time. Else, you might create a spatiotemporal disaster that we have never seen.

The philosophers (and the whole planet, but they doesn't know it) placed all their hopes in you... Do not disappoint them !

Courage, strength, self-sacrifice, and man pages will be you best friends in order to achieve this mission !

Technical details

- You MUST use the given library for project monitoring.

Indices `Read the header file to have a description for each function`

- Your program takes the following parameters
  - -p followed by the number of philosophers.
  - -e followed by the max eat occurence for a philosopher before exiting the program.

ex:

```
./philo -p 7 -e 15
```

- Do NOT print anything on the standard output, only the referee library is allowed to print a final report.

Forbidden functions

- signal
- sigaction

Authorized functions

- C Library
- POSIX Threads library