Carrefour - Techniqual informations

File architecture

```
|
|__ includes
|  |
|  |__ carrefour.h : all data structures and function definition
|
|__ src
   |
   |__ main.c : core functions and main
   |__ options.c : options parsing
```

Semaphores

We have few semaphores:

- a semaphor for each traffic lights, which is used to let a car known when it can go
- a semaphor which is used to prevent parallel modifications of counters

Global variables

data which contains state and parameters **light_sems** and **add_car_sem** (see above)

Differents processes

There are a few different processes types:

- traffic light switcher process
- car addition processes (for interactive and automatic modes)
- car watcher, waiting for the car to pass

Traffic light switcher

```
def traffic_light_switcher():
    while car_can_be_added() or road_is_not_empty():
        turn_off(first_light)
        turn_on(second_light)
        release_cars(second_light)

        swap(first_light, second_light)
        sleep()
```

Car addition (automatic)

```
def add_car(light):
    car = create_car(next_id(), light)
    fork(car_watcher(car))

def car_addition_auto():
    while car_can_be_added():
        sleep_random_time()
        add_car(first_light)
```

Car addition (interactive)

```
def car_addition_interactive():
    while car_can_be_added():
        if input_ready():
            add_car(input())
        else:
            sleep() # sleep a short amount of time
```

Car watcher

```
def car_watcher(car):
    semaphore_road[car.road].wait()
```