

# **System Programming (MEEC/MEAer)**

## **Project Assignment 2019/2020**

This document presents a possible organization of the project report, stating the required section and the content that should be there.

### **1 – Architecture**

Graphical presentation of the project architecture with the identification of:

- Nodes (various processes that participate on the project)
- Modules (logical modules that are responsible for the execution of particular functionalities)
- Threads

A node is a process that has some functionalities. Each type of node is composed of various modules.

A module is a set of functions and data types that is responsible for the implementation of a certain type of functionalities

This architecture should also represent the threads running on each node, describing the responsibility of each one.

The graphical representation of the architecture should also include the communication mechanism (shared memory, pipes/FIFOS/sockets, SDL events).

### **2 – Code organization**

Description on how nodes and modules are implemented in code, presenting the various source code files (.c and .h), the functions present in such modules, and its documentation.

### **3 – Data structures**

Description of the data structures that are stored on the various modules (for instance board and player list), characters, ...

### **4 – Communication protocols**

Description of the communications protocol between the clients and the server. This should include a list of the various operations that are requested by the clients, along with the presentation of the structure and order of the various messages exchanged between the client and the server

### **5 – Validation**

Description of the data validations that are performed with respect to:

- the data that is transferred between processes
- functions returned values

For each message exchanges this section should present the various incorrect cases that are handled by the validations. This should also identify the function/line code where they are performed.

### **5 – Description of the various implemented functionalities**

This section should include a list of all the rules/actions of the games with description of how they were implemented with the help of the algorithms or complementary diagrams:

- Control of the pacman and monster on the client
- Validation of the maximum number of players
- Placement of new players
- Client disconnect
- Character movement
  - empty position
  - against wall
  - against fruit
  - change position
  - monster eating
  - superpowered pacman eating
- Guarantee of 2 movements per second max.
- Fruit management (eating and placement)
  - 2 seconds
- Character inactivity
  - 30 seconds
- Superpowered pacman
  - Activation/deactivation
- Game score board
  - 1 minute frequency
- Data cleanup

## **6 – Critical regions/Synchronization**

Identification of the various critical regions presented in the code (presentation of the threads that intervene in such critical regions and on what operations they occur), with indication of code lines where such critical regions occur.

Description on how the race conditions are solved, presentation of the various synchronizations primitives used to guard the data structure.