



## **TABIT PROGRAMMING EXAM**

### **- Boardgame simulation “Alexandria” -**

You are provided with a simulation against an empty engine. The engine must be developed in such a way that you can run a complete game with the given simulation.

The simulation consists of:

- an initiation for the number of players: input number of players
- repeating calls to do the turns of each player: input dice number (engine decides which player is next and tracks all situations!)

#### **Your task:**

- Implement the engine and test it extensively and automatically
- You have 3 hours time to finish your task and to hand in your exam

### **Game rules**

The game is a classic board game where between 2 and 4 players play against each other. It consists of a “straight road” of playing fields which have to be traversed. The goal is to pass the 30<sup>th</sup> playing field as the first player to win the game.

The order of the players will be by chance. The starting player roles the dice first and advances as many fields as the numbers on the dice shows. If the field which the player ends up at is a standard playing field his turns ends and the next player in line begins his turn. Players can share the same playing field. If the playing field is a special field, the player has to react to what the special field dictates. As described below there are special fields like bonus and trap fields.

Bonus and trap fields can only be activated once per player turn. That means for example, that if a player ends up on a bonus field which advances him automatically 2 fields further and then ends up on a trap field, the trap is NOT activated for this player.

The special fields are permanently active and do not dissolve by being activated once from a player.

That means that the same bonus can be used by more than one player in case they hit that field.

The distribution of the bonus and trap fields (5 each) is done randomly at the beginning of each game, with the exception that bonus and trap fields cannot overlap each other.

The specific type of the distributed bonus and trap fields is randomly picked when a player activates the special field. That means for example the 5<sup>th</sup> playing field is a trap field. Player 1 activates it and gets randomly the trap type 2. The turn player 3 activates the same trap field (number 5 on the board) and the type of trap is again selected randomly. Meaning the location of the special fields stay the same for one game, the types are always selected randomly.

**Bonus fields**

- Type 1: move forward 2 additional fields
- Type 2: all other players have to go back 2 fields (moving backwards does not trigger bonus or trap fields)
- Type 3: “Joker” that saves the player from the next trap he himself activates; a player can only have one “Joker” at a time

**Trap fields**

- Type 1: move 2 fields back
- Type 2: all other players move forward 2 fields (moving forward does not trigger bonus or trap fields)
- Type 3: skip the next round

**Fields**

- All-in-all 30 playing fields (including the 10 special fields)
- 5 bonus fields
- 5 trap fields

**Players**

- 2-4

**GOOD LUCK!**