

Larger Than Life

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Chapter 1

ZPR_22L_Forczech_Szarejko

1.1 instalacja

- `pip install -r requirements.txt`
- `pip install .`

1.2 testy python

- `pytest`

1.3 testy cpp

Z racji na flagi ustawione przy kompilacji, testowanie jest możliwe tylko na środowisku Linux

- `mkdir build; cd build; cmake ..; make test`

1.4 uruchomienie aplikacji

- przejść do folderu głównego, w którym znajdują się foldery `src` oraz `tests`
- `python3 -m src.main`

Chapter 2

Namespace Index

2.1 Namespace List

Here is a list of all namespaces with brief descriptions:

setup	9
src	12
src.game	12
src.gui	12
src.main	13
tests	14
tests.test_GUI	14

Chapter 3

Class Index

3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Board	17
BoardArgs	21
src.game.Game	22
src.gui.GUI	25

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

setup.py	33
src/__init__.py	33
src/bindings.cpp	34
src/board.cpp	35
src/board.hpp	36
src/game.py	39
src/gui.py	39
src/main.py	40
src/random_rules.cpp	40
src/random_rules.hpp	42
tests/__init__.py	34
tests/test_board.cpp	44
tests/test_GUI.py	51
tests/test_random_rules.cpp	51

Chapter 5

Namespace Documentation

5.1 setup Namespace Reference

Variables

- string `__version__` = "0.0.1"
- list `ext_modules`
- `name`
- `version`
- `install_requires`
- `author`
- `author_email`
- `url`
- `description`
- `long_description`
- `extras_require`
- `cmdclass`
- `zip_safe`
- `python_requires`

5.1.1 Variable Documentation

5.1.1.1 `__version__`

```
string setup.__version__ = "0.0.1" [private]
```

Definition at line 5 of file setup.py.

5.1.1.2 author

`setup.author`

Definition at line 20 of file `setup.py`.

5.1.1.3 author_email

`setup.author_email`

Definition at line 21 of file `setup.py`.

5.1.1.4 cmdclass

`setup.cmdclass`

Definition at line 27 of file `setup.py`.

5.1.1.5 description

`setup.description`

Definition at line 23 of file `setup.py`.

5.1.1.6 ext_modules

`setup.ext_modules`

Initial value:

```
1 = [  
2     Pybind11Extension("board",  
3                       ["src/bindings.cpp"],),  
4     Pybind11Extension("myrandoms",  
5                       ["src/bindings.cpp"],),  
6 ]
```

Definition at line 7 of file `setup.py`.

5.1.1.7 extras_require

`setup.extras_require`

Definition at line 26 of file setup.py.

5.1.1.8 install_requires

`setup.install_requires`

Definition at line 18 of file setup.py.

5.1.1.9 long_description

`setup.long_description`

Definition at line 24 of file setup.py.

5.1.1.10 name

`setup.name`

Definition at line 16 of file setup.py.

5.1.1.11 python_requires

`setup.python_requires`

Definition at line 29 of file setup.py.

5.1.1.12 url

`setup.url`

Definition at line 22 of file setup.py.

5.1.1.13 version

`setup.version`

Definition at line 17 of file setup.py.

5.1.1.14 zip_safe

`setup.zip_safe`

Definition at line 28 of file setup.py.

5.2 src Namespace Reference

Namespaces

- [game](#)
- [gui](#)
- [main](#)

5.3 src.game Namespace Reference

Classes

- class [Game](#)

5.4 src.gui Namespace Reference

Classes

- class [GUI](#)

Variables

- `game` = [GUI](#)()

5.4.1 Variable Documentation

5.4.1.1 game

```
src.gui.game = GUI()
```

Definition at line 263 of file gui.py.

5.5 src.main Namespace Reference

Functions

- def `calc` (params, q, lock)
- def `update_loop` (gui, lock, q, p)
- def `main` ()

5.5.1 Function Documentation

5.5.1.1 calc()

```
def src.main.calc (  
    params,  
    q,  
    lock )
```

Definition at line 8 of file main.py.

5.5.1.2 main()

```
def src.main.main ( )
```

Definition at line 44 of file main.py.

5.5.1.3 update_loop()

```
def src.main.update_loop (  
    gui,  
    lock,  
    q,  
    p )
```

Definition at line 29 of file main.py.

5.6 tests Namespace Reference

Namespaces

- [test_GUI](#)

5.7 tests.test_GUI Namespace Reference

Functions

- def [test_check_conditions](#) ()
- def [test_check_conditions_error](#) ()
- def [test_check_conditions_empty](#) ()
- def [test_close_gui_change](#) ()
- def [test_if_close](#) ()
- def [test_set_close_after_set](#) ()
- def [test_get_params_empty](#) ()
- def [test_get_params_from_json](#) ()
- def [test_get_params_not_empty](#) ()

5.7.1 Function Documentation

5.7.1.1 test_check_conditions()

```
def tests.test_GUI.test_check_conditions ( )
```

Definition at line 5 of file test_GUI.py.

5.7.1.2 test_check_conditions_empty()

```
def tests.test_GUI.test_check_conditions_empty ( )
```

Definition at line 17 of file test_GUI.py.

5.7.1.3 test_check_conditions_error()

```
def tests.test_GUI.test_check_conditions_error ( )
```

Definition at line 11 of file test_GUI.py.

5.7.1.4 test_close_gui_change()

```
def tests.test_GUI.test_close_gui_change ( )
```

Definition at line 23 of file test_GUI.py.

5.7.1.5 test_get_params_empty()

```
def tests.test_GUI.test_get_params_empty ( )
```

Definition at line 44 of file test_GUI.py.

5.7.1.6 test_get_params_from_json()

```
def tests.test_GUI.test_get_params_from_json ( )
```

Definition at line 49 of file test_GUI.py.

5.7.1.7 test_get_params_not_empty()

```
def tests.test_GUI.test_get_params_not_empty ( )
```

Definition at line 58 of file test_GUI.py.

5.7.1.8 test_if_close()

```
def tests.test_GUI.test_if_close ( )
```

Definition at line 30 of file test_GUI.py.

5.7.1.9 test_set_close_after_set()

```
def tests.test_GUI.test_set_close_after_set ( )
```

Definition at line 36 of file test_GUI.py.

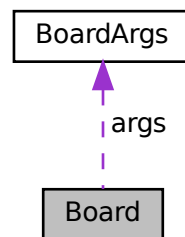
Chapter 6

Class Documentation

6.1 Board Class Reference

```
#include <board.hpp>
```

Collaboration diagram for Board:



Public Member Functions

- [Board](#) ([BoardArgs](#) boardArgs)
- [Board](#) ([BoardArgs](#) boardArgs, const [cells_t](#) &startState)
- void [update](#) ()
- const [cells_t](#) & [getCells](#) () const
- size_t [getSize](#) () const

Private Member Functions

- void [checkArgsCorrect](#) () const
- bool [testBirthConditions](#) (size_t row, size_t col) const
- bool [testSurvivalConditions](#) (size_t row, size_t col) const
- bool [testConditions](#) (size_t row, size_t col, const [conds_t](#) &conds) const
- int [getNeighborsInRow](#) (size_t centerRow, size_t centerCol, int offset) const
- void [getRandomStartCells](#) (std::set< [cell_t](#) > &cellSet) const

Private Attributes

- const [BoardArgs](#) args
- [cells_t](#) cells {}
- [cells_t](#) snapshot {}

6.1.1 Detailed Description

Definition at line 36 of file board.hpp.

6.1.2 Constructor & Destructor Documentation

6.1.2.1 Board() [1/2]

```
Board::Board (  
    BoardArgs boardArgs )    [explicit]
```

Definition at line 6 of file board.cpp.

6.1.2.2 Board() [2/2]

```
Board::Board (  
    BoardArgs boardArgs,  
    const cells\_t & startState )
```

Definition at line 23 of file board.cpp.

6.1.3 Member Function Documentation

6.1.3.1 checkArgsCorrect()

```
void Board::checkArgsCorrect ( ) const    [private]
```

Definition at line 57 of file board.cpp.

6.1.3.2 getCells()

```
const cells_t & Board::getCells ( ) const
```

Definition at line 49 of file board.cpp.

6.1.3.3 getNeighborsInRow()

```
int Board::getNeighborsInRow (
    size_t centerRow,
    size_t centerCol,
    int offset ) const [private]
```

Definition at line 134 of file board.cpp.

6.1.3.4 getRandomStartCells()

```
void Board::getRandomStartCells (
    std::set< cell_t > & cellSet ) const [private]
```

Definition at line 79 of file board.cpp.

6.1.3.5 getSize()

```
size_t Board::getSize ( ) const
```

Definition at line 53 of file board.cpp.

6.1.3.6 testBirthConditions()

```
bool Board::testBirthConditions (
    size_t row,
    size_t col ) const [private]
```

Definition at line 107 of file board.cpp.

6.1.3.7 testConditions()

```
bool Board::testConditions (
    size_t row,
    size_t col,
    const conds\_t & conds ) const [private]
```

Definition at line 117 of file board.cpp.

6.1.3.8 testSurvivalConditions()

```
bool Board::testSurvivalConditions (
    size_t row,
    size_t col ) const [private]
```

Definition at line 112 of file board.cpp.

6.1.3.9 update()

```
void Board::update ( )
```

Definition at line 28 of file board.cpp.

6.1.4 Member Data Documentation

6.1.4.1 args

```
const BoardArgs Board::args [private]
```

Definition at line 38 of file board.hpp.

6.1.4.2 cells

```
cells\_t Board::cells {} [private]
```

Definition at line 39 of file board.hpp.

6.1.4.3 snapshot

```
cells_t Board::snapshot {} [private]
```

Definition at line 40 of file board.hpp.

The documentation for this class was generated from the following files:

- [src/board.hpp](#)
- [src/board.cpp](#)

6.2 BoardArgs Struct Reference

```
#include <board.hpp>
```

Public Attributes

- int [neighborhoodRadius](#) = 1
- int [states](#) = 2
- [conds_t](#) [surviveConds](#) = [conds_t\(\)](#)
- [conds_t](#) [birthConds](#) = [conds_t\(\)](#)
- bool [isIncludeCenter](#) = false
- bool [isMooreType](#) = true

6.2.1 Detailed Description

Definition at line 24 of file board.hpp.

6.2.2 Member Data Documentation

6.2.2.1 birthConds

```
conds_t BoardArgs::birthConds = conds_t()
```

Definition at line 28 of file board.hpp.

6.2.2.2 isIncludeCenter

```
bool BoardArgs::isIncludeCenter = false
```

Definition at line 29 of file board.hpp.

6.2.2.3 isMooreType

```
bool BoardArgs::isMooreType = true
```

Definition at line 30 of file board.hpp.

6.2.2.4 neighborhoodRadius

```
int BoardArgs::neighborhoodRadius = 1
```

Definition at line 25 of file board.hpp.

6.2.2.5 states

```
int BoardArgs::states = 2
```

Definition at line 26 of file board.hpp.

6.2.2.6 surviveConds

```
conds_t BoardArgs::surviveConds = conds_t()
```

Definition at line 27 of file board.hpp.

The documentation for this struct was generated from the following file:

- src/[board.hpp](#)

6.3 src.game.Game Class Reference

Public Member Functions

- Any `__init__` (self, pygame.Surface screen, Dict params)
- None `update` (self, List[List[int]] new_values)
- tuple[int] `pick_color` (self, int value)

Static Private Attributes

- `_screen` = None
- `_size` = None
- `_width` = None
- `_height` = None
- `int _tile_size` = 10
- `tuple _dead_color` = (115, 140, 165)
- `tuple _alive_color` = (165, 230, 130)
- `_states_number` = None

6.3.1 Detailed Description

Definition at line 6 of file game.py.

6.3.2 Constructor & Destructor Documentation

6.3.2.1 `__init__()`

```
Any src.game.Game.__init__ (
    self,
    pygame.Surface screen,
    Dict params )
```

Creates object of class Game that is responsible for displaying actual state of game

Args:

- `screen` (pygame.Surface): surface to display
- `params` (Dict): parameters of the game

Definition at line 16 of file game.py.

6.3.3 Member Function Documentation

6.3.3.1 `pick_color()`

```
tuple[int] src.game.Game.pick_color (
    self,
    int value )
```

Generates new color depends on cell value

Args:

- `value` (int): age of cell, where 0 is dead

Returns:

- `tuple[int]`: calculated color in RGB

Definition at line 57 of file game.py.

6.3.3.2 update()

```
None src.game.Game.update (
    self,
    List[List[int]] new_values )
```

Updates rects on pygame.Screen to new states

Args:
new_values (List[List[int]]): new states of cells

Definition at line 42 of file game.py.

6.3.4 Member Data Documentation

6.3.4.1 _alive_color

```
tuple src.game.Game._alive_color = (165, 230, 130) [static], [private]
```

Definition at line 13 of file game.py.

6.3.4.2 _dead_color

```
tuple src.game.Game._dead_color = (115, 140, 165) [static], [private]
```

Definition at line 12 of file game.py.

6.3.4.3 _height

```
src.game.Game._height = None [static], [private]
```

Definition at line 10 of file game.py.

6.3.4.4 _screen

```
src.game.Game._screen = None [static], [private]
```

Definition at line 7 of file game.py.

6.3.4.5 `_size`

```
src.game.Game._size = None [static], [private]
```

Definition at line 8 of file game.py.

6.3.4.6 `_states_number`

```
src.game.Game._states_number = None [static], [private]
```

Definition at line 14 of file game.py.

6.3.4.7 `_tile_size`

```
int src.game.Game._tile_size = 10 [static], [private]
```

Definition at line 11 of file game.py.

6.3.4.8 `_width`

```
src.game.Game._width = None [static], [private]
```

Definition at line 9 of file game.py.

The documentation for this class was generated from the following file:

- [src/game.py](#)

6.4 src.gui.GUI Class Reference

Public Member Functions

- Any `__init__` (self)
- Dict `get_params` (self)
- bool `if_close` (self)
- None `set_gui_close` (self)
- None `create_game` (self)
- None `clear_screen` (self)
- None `create_game_manual` (self)
- None `create_game_random` (self)
- None `prepare_rules` (self)
- None `get_params_from_json` (self, str path)
- None `export_rules` (self)
- None `prompt_file` (self)
- List[int] `check_condition` (self, str text_cond)
- None `start_with_manual_rules` (self)
- None `start_with_random_rules` (self)
- None `choosing_menu` (self)
- None `manual_menu` (self)

Static Public Attributes

- `game` = None

Private Attributes

- `_close_gui`
- `_init_board`

Static Private Attributes

- `_screen` = None
- list `_size` = [600, 600]
- bool `_close_gui` = False
- `_menu` = None
- `_manual` = None
- dictionary `_params` = {}

6.4.1 Detailed Description

Definition at line 12 of file gui.py.

6.4.2 Constructor & Destructor Documentation

6.4.2.1 `__init__()`

```
Any src.gui.GUI.__init__ (  
    self )
```

Definition at line 21 of file gui.py.

6.4.3 Member Function Documentation

6.4.3.1 check_condition()

```
List[int] src.gui.GUI.check_condition (
    self,
    str text_cond )
```

Gets conditions from string

Example: from '2-5,7' gets [2,3,4,5,7]

Args:

text_cond (str): string with rules in format '2-3,5'

Raises:

ValueError: when format of string is not correct

Returns:

List[int]: list with conditions

Definition at line 153 of file gui.py.

6.4.3.2 choosing_menu()

```
None src.gui.GUI.choosing_menu (
    self )
```

Shows main menu. Here it is possible to choose source of rules for the game

Definition at line 213 of file gui.py.

6.4.3.3 clear_screen()

```
None src.gui.GUI.clear_screen (
    self )
```

Clears screen from menus

Definition at line 51 of file gui.py.

6.4.3.4 create_game()

```
None src.gui.GUI.create_game (
    self )
```

Ask how to initialize alive cells

Definition at line 41 of file gui.py.

6.4.3.5 create_game_manual()

```
None src.gui.GUI.create_game_manual (  
    self )
```

Creates game and provide opportunity
to provide manually which cells are alive.

Definition at line 60 of file gui.py.

6.4.3.6 create_game_random()

```
None src.gui.GUI.create_game_random (  
    self )
```

Creates game without manually provided alive cells.

Definition at line 97 of file gui.py.

6.4.3.7 export_rules()

```
None src.gui.GUI.export_rules (  
    self )
```

Export manually provided rules to json file

Definition at line 132 of file gui.py.

6.4.3.8 get_params()

```
Dict src.gui.GUI.get_params (  
    self )
```

Definition at line 26 of file gui.py.

6.4.3.9 get_params_from_json()

```
None src.gui.GUI.get_params_from_json (
    self,
    str path )
```

Loads parameters from json file

Args:

path (str): path to json file with params

Definition at line 117 of file gui.py.

6.4.3.10 if_close()

```
bool src.gui.GUI.if_close (
    self )
```

Checks if program can close gui

Returns:

bool: close gui or not

Definition at line 29 of file gui.py.

6.4.3.11 manual_menu()

```
None src.gui.GUI.manual_menu (
    self )
```

Shows menu to provide rules manually.
Provide option to save rules in json file.

Definition at line 231 of file gui.py.

6.4.3.12 prepare_rules()

```
None src.gui.GUI.prepare_rules (
    self )
```

Prepares rules from widgets from manual menu

Definition at line 104 of file gui.py.

6.4.3.13 `prompt_file()`

```
None src.gui.GUI.prompt_file (  
    self )
```

Create a Tk file dialog to choose json file
with rules for the game and cleanup when finished

Definition at line 143 of file gui.py.

6.4.3.14 `set_gui_close()`

```
None src.gui.GUI.set_gui_close (  
    self )
```

Sets `close_gui` to true

Definition at line 37 of file gui.py.

6.4.3.15 `start_with_manual_rules()`

```
None src.gui.GUI.start_with_manual_rules (  
    self )
```

Prepare rules provided and start main loop of the game

Definition at line 182 of file gui.py.

6.4.3.16 `start_with_random_rules()`

```
None src.gui.GUI.start_with_random_rules (  
    self )
```

Generates random rules and export them to 'actual_rules.json'

Definition at line 188 of file gui.py.

6.4.4 Member Data Documentation

6.4.4.1 `_close_gui` [1/2]

```
bool src.gui.GUI._close_gui = False [static], [private]
```

Definition at line 15 of file gui.py.

6.4.4.2 `_close_gui` [2/2]

```
src.gui.GUI._close_gui [private]
```

Definition at line 22 of file gui.py.

6.4.4.3 `_init_board`

```
src.gui.GUI._init_board [private]
```

Definition at line 44 of file gui.py.

6.4.4.4 `_manual`

```
src.gui.GUI._manual = None [static], [private]
```

Definition at line 17 of file gui.py.

6.4.4.5 `_menu`

```
src.gui.GUI._menu = None [static], [private]
```

Definition at line 16 of file gui.py.

6.4.4.6 `_params`

```
dictionary src.gui.GUI._params = {} [static], [private]
```

Definition at line 18 of file gui.py.

6.4.4.7 `_screen`

```
src.gui.GUI._screen = None [static], [private]
```

Definition at line 13 of file gui.py.

6.4.4.8 `_size`

```
list src.gui.GUI._size = [600, 600] [static], [private]
```

Definition at line 14 of file gui.py.

6.4.4.9 `game`

```
src.gui.GUI.game = None [static]
```

Definition at line 19 of file gui.py.

The documentation for this class was generated from the following file:

- [src/gui.py](#)

Chapter 7

File Documentation

7.1 README.md File Reference

7.2 setup.py File Reference

Namespaces

- [setup](#)

Variables

- string [setup.__version__](#) = "0.0.1"
- list [setup.ext_modules](#)
- [setup.name](#)
- [setup.version](#)
- [setup.install_requires](#)
- [setup.author](#)
- [setup.author_email](#)
- [setup.url](#)
- [setup.description](#)
- [setup.long_description](#)
- [setup.extras_require](#)
- [setup.cmdclass](#)
- [setup.zip_safe](#)
- [setup.python_requires](#)

7.3 src/__init__.py File Reference

Namespaces

- [src](#)

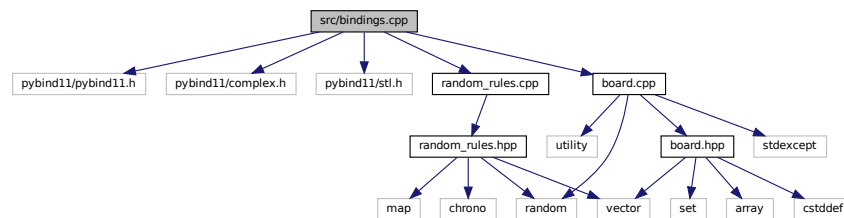
7.4 tests/___init___py File Reference

Namespaces

- [tests](#)

7.5 src/bindings.cpp File Reference

```
#include <pybind11/pybind11.h>
#include <pybind11/complex.h>
#include <pybind11/stl.h>
#include "board.cpp"
#include "random_rules.cpp"
Include dependency graph for bindings.cpp:
```



Functions

- [PYBIND11_MODULE](#) ([board](#), m)
- [PYBIND11_MODULE](#) ([myrandoms](#), m)

7.5.1 Function Documentation

7.5.1.1 PYBIND11_MODULE() [1/2]

```
PYBIND11_MODULE (
    board ,
    m )
```

Definition at line 9 of file bindings.cpp.

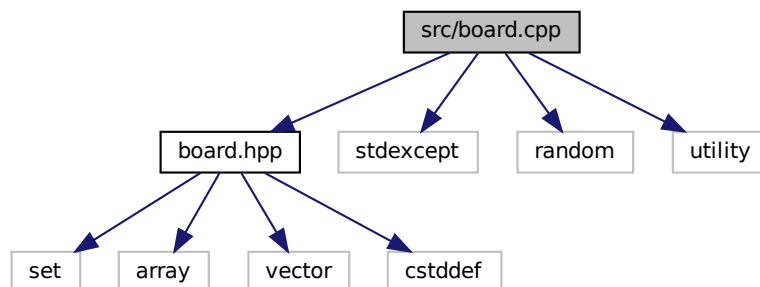
7.5.1.2 PYBIND11_MODULE() [2/2]

```
PYBIND11_MODULE (
    myrandoms ,
    m )
```

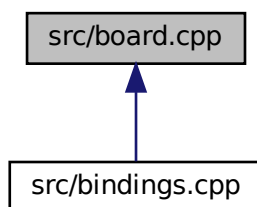
Definition at line 30 of file bindings.cpp.

7.6 src/board.cpp File Reference

```
#include "board.hpp"
#include <stdexcept>
#include <random>
#include <utility>
Include dependency graph for board.cpp:
```



This graph shows which files directly or indirectly include this file:



Functions

- bool [isCorrectOffset](#) (size_t coord, int offset)
- size_t [addOffset](#) (size_t coord, int offset)

7.6.1 Function Documentation

7.6.1.1 addOffset()

```
size_t addOffset (
    size_t coord,
    int offset ) [inline]
```

Definition at line 95 of file board.cpp.

7.6.1.2 isCorrectOffset()

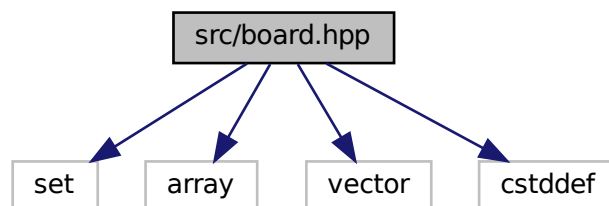
```
bool isCorrectOffset (
    size_t coord,
    int offset ) [inline]
```

Definition at line 91 of file board.cpp.

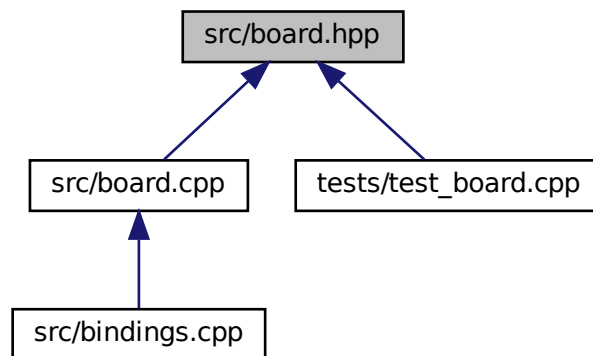
7.7 src/board.hpp File Reference

```
#include <set>
#include <array>
#include <vector>
#include <cstdint>
```

Include dependency graph for board.hpp:



This graph shows which files directly or indirectly include this file:



Classes

- struct [BoardArgs](#)
- class [Board](#)

Typedefs

- typedef std::set< int > [conds_t](#)
- typedef int [cell_t](#)
- typedef std::array< [cell_t](#), [BOARD_SIZE](#) > [row_t](#)
- typedef std::array< [row_t](#), [BOARD_SIZE](#) > [cells_t](#)

Variables

- const int [NEIGHBORHOOD_RADIUS_MIN](#) = 1
- const int [NEIGHBORHOOD_RADIUS_MAX](#) = 10
- const int [STATES_MIN](#) = 2
- const int [STATES_MAX](#) = 256
- const int [START_CELLS_ALIVE](#) = 150
- const size_t [BOARD_SIZE](#) = 60

7.7.1 Typedef Documentation

7.7.1.1 cell_t

```
typedef int cell_t
```

Definition at line 18 of file board.hpp.

7.7.1.2 cells_t

```
typedef std::array<row_t, BOARD_SIZE> cells_t
```

Definition at line 20 of file board.hpp.

7.7.1.3 conds_t

```
typedef std::set<int> conds_t
```

Definition at line 16 of file board.hpp.

7.7.1.4 row_t

```
typedef std::array<cell_t, BOARD_SIZE> row_t
```

Definition at line 19 of file board.hpp.

7.7.2 Variable Documentation

7.7.2.1 BOARD_SIZE

```
const size_t BOARD_SIZE = 60
```

Definition at line 14 of file board.hpp.

7.7.2.2 NEIGHBORHOOD_RADIUS_MAX

```
const int NEIGHBORHOOD_RADIUS_MAX = 10
```

Definition at line 8 of file board.hpp.

7.7.2.3 NEIGHBORHOOD_RADIUS_MIN

```
const int NEIGHBORHOOD_RADIUS_MIN = 1
```

Definition at line 7 of file board.hpp.

7.7.2.4 START_CELLS_ALIVE

```
const int START_CELLS_ALIVE = 150
```

Definition at line 13 of file board.hpp.

7.7.2.5 STATES_MAX

```
const int STATES_MAX = 256
```

Definition at line 11 of file board.hpp.

7.7.2.6 STATES_MIN

```
const int STATES_MIN = 2
```

Definition at line 10 of file board.hpp.

7.8 src/game.py File Reference

Classes

- class [src.game.Game](#)

Namespaces

- [src.game](#)

7.9 src/gui.py File Reference

Classes

- class [src.gui.GUI](#)

Namespaces

- [src.gui](#)

Variables

- [src.gui.game](#) = GUI()

7.10 src/main.py File Reference

Namespaces

- [src.main](#)

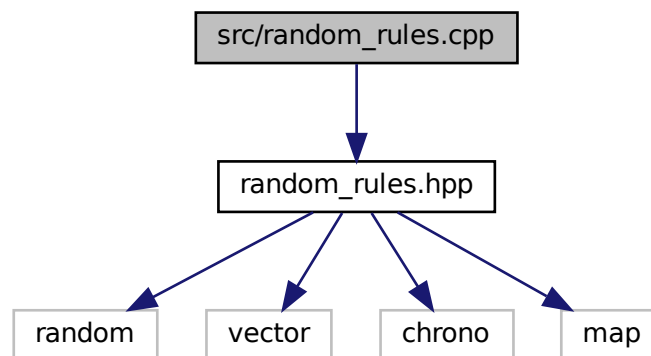
Functions

- def [src.main.calc](#) (params, q, lock)
- def [src.main.update_loop](#) (gui, lock, q, p)
- def [src.main.main](#) ()

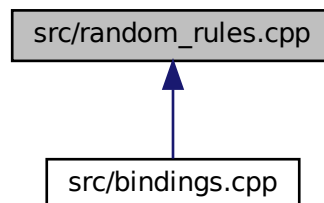
7.11 src/random_rules.cpp File Reference

```
#include "random_rules.hpp"
```

Include dependency graph for random_rules.cpp:



This graph shows which files directly or indirectly include this file:



Functions

- `mt19937 generator (seed)`
- `vector< int > generate_birth_survive_cond ()`
- `int generate_range ()`
- `bool generate_middle_included ()`
- `char generate_neighbourhood ()`
- `int generate_number_of_states ()`

Variables

- `auto seed = chrono::high_resolution_clock::now().time_since_epoch().count()`

7.11.1 Function Documentation

7.11.1.1 generate_birth_survive_cond()

```
vector<int> generate_birth_survive_cond ( )
```

Definition at line 6 of file random_rules.cpp.

7.11.1.2 generate_middle_included()

```
bool generate_middle_included ( )
```

Definition at line 18 of file random_rules.cpp.

7.11.1.3 generate_neighbourhood()

```
char generate_neighbourhood ( )
```

Definition at line 22 of file random_rules.cpp.

7.11.1.4 generate_number_of_states()

```
int generate_number_of_states ( )
```

Definition at line 26 of file random_rules.cpp.

7.11.1.5 generate_range()

```
int generate_range ( )
```

Definition at line 14 of file random_rules.cpp.

7.11.1.6 generator()

```
mt19937 generator (
    seed )
```

7.11.2 Variable Documentation

7.11.2.1 seed

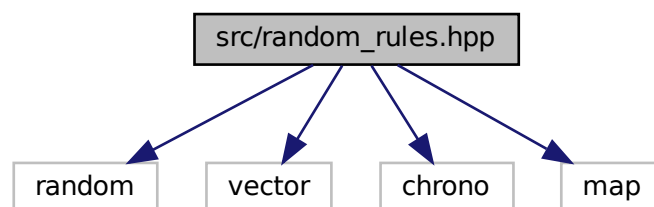
```
auto seed = chrono::high_resolution_clock::now().time_since_epoch().count()
```

Definition at line 3 of file random_rules.cpp.

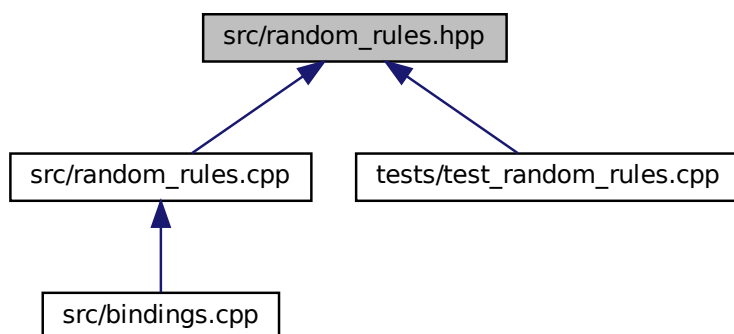
7.12 src/random_rules.hpp File Reference

```
#include <random>
#include <vector>
#include <chrono>
#include <map>
```

Include dependency graph for random_rules.hpp:



This graph shows which files directly or indirectly include this file:



Functions

- `vector< int > generate_birth_survive_cond ()`
- `int generate_number_of_states ()`
- `int generate_range ()`
- `bool generate_middle_included ()`
- `char generate_neighbourhood ()`

7.12.1 Function Documentation

7.12.1.1 generate_birth_survive_cond()

```
vector<int> generate_birth_survive_cond ( )
```

Definition at line 6 of file random_rules.cpp.

7.12.1.2 generate_middle_included()

```
bool generate_middle_included ( )
```

Definition at line 18 of file random_rules.cpp.

7.12.1.3 generate_neighbourhood()

```
char generate_neighbourhood ( )
```

Definition at line 22 of file random_rules.cpp.

7.12.1.4 generate_number_of_states()

```
int generate_number_of_states ( )
```

Definition at line 26 of file random_rules.cpp.

7.12.1.5 generate_range()

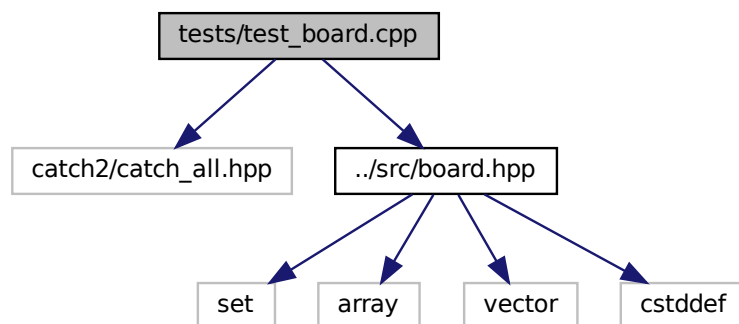
```
int generate_range ( )
```

Definition at line 14 of file random_rules.cpp.

7.13 tests/test_board.cpp File Reference

```
#include <catch2/catch_all.hpp>  
#include "../src/board.hpp"
```

Include dependency graph for test_board.cpp:



Typedefs

- typedef std::tuple< size_t, size_t > [coords_t](#)
- typedef std::set< [coords_t](#) > [coords_vect_t](#)

Functions

- `TEST_CASE` ("Create `Board` with negative `neighborhoodRadius`")
- `TEST_CASE` ("Create `Board` with `neighborhoodRadius` out of bounds")
- `TEST_CASE` ("Create `Board` with negative `states`")
- `TEST_CASE` ("Create `Board` with `states` out of bounds")
- `TEST_CASE` ("Create `Board` with empty `birthConds`")
- `TEST_CASE` ("Create `Board` with empty `surviveConds`")
- `TEST_CASE` ("Create `Board` with incorrect cell values")
- `TEST_CASE` ("Constructor taking `BoardArgs` OK")
- `TEST_CASE` ("Constructor taking `BoardArgs` and `cells_t` OK")
- `TEST_CASE` ("getSize returns correct size")
- `TEST_CASE` ("Correct amount of alive `cells` initialized")
- `int calculateNeighbors` (const `cells_t` &`cells`, const `coords_t` &`coords`)
- `args birthConds insert` (1)
- `args surviveConds insert` (3)
- `for` (`size_t row=0; row < board.getSize(); ++row`)
- `board update` ()
- `for` (auto `coords :shouldBeAlive`)
- `args birthConds insert` (2)
- `args birthConds insert` (4)
- `for` (int `state=2; state <= args.states; ++state`)

Variables

- `args neighborhoodRadius` = 1
- `args states` = 2
- `args isIncludeCenter` = false
- `args isMooreType` = false
- `auto board` = `Board(args)`
- `coords_vect_t shouldBeAlive`
- `auto cells` = `board.getCells()`
- `coords_vect_t shouldBeDead`
- `coords_vect_t shouldDecrease`

7.13.1 Typedef Documentation

7.13.1.1 `coords_t`

```
typedef std::tuple<size_t, size_t> coords_t
```

Definition at line 132 of file `test_board.cpp`.

7.13.1.2 `coords_vect_t`

```
typedef std::set<coords_t> coords_vect_t
```

Definition at line 133 of file `test_board.cpp`.

7.13.2 Function Documentation

7.13.2.1 calculateNeighbors()

```
int calculateNeighbors (
    const cells\_t & cells,
    const coords\_t & coords )
```

Definition at line 135 of file test_board.cpp.

7.13.2.2 for() [1/3]

```
for (
    auto coords :shouldBeAlive )
```

Definition at line 189 of file test_board.cpp.

7.13.2.3 for() [2/3]

```
for (
    int state = 2; state <= args.states; ++state )
```

Definition at line 445 of file test_board.cpp.

7.13.2.4 for() [3/3]

```
for ( )
```

Definition at line 172 of file test_board.cpp.

7.13.2.5 insert() [1/4]

```
args surviveConds insert (
    1 )
```

Initial value:

```
{
    BoardArgs args
```

7.13.2.6 insert() [2/4]

```
args surviveConds insert (  
    2 )
```

Initial value:

```
{  
    BoardArgs args
```

7.13.2.7 insert() [3/4]

```
args surviveConds insert (  
    3 )
```

7.13.2.8 insert() [4/4]

```
args surviveConds insert (  
    4 )
```

7.13.2.9 TEST_CASE() [1/11]

```
TEST_CASE (  
    "Constructor taking BoardArgs and cells_t OK" )
```

Definition at line 85 of file test_board.cpp.

7.13.2.10 TEST_CASE() [2/11]

```
TEST_CASE (  
    "Constructor taking BoardArgs OK" )
```

Definition at line 77 of file test_board.cpp.

7.13.2.11 TEST_CASE() [3/11]

```
TEST_CASE (  
    "Correct amount of alive cells initialized" )
```

Definition at line 110 of file test_board.cpp.

7.13.2.12 TEST_CASE() [4/11]

```
TEST_CASE (
    "Create Board with empty birthConds" )
```

Definition at line 44 of file test_board.cpp.

7.13.2.13 TEST_CASE() [5/11]

```
TEST_CASE (
    "Create Board with empty surviveConds" )
```

Definition at line 52 of file test_board.cpp.

7.13.2.14 TEST_CASE() [6/11]

```
TEST_CASE (
    "Create Board with incorrect cell values" )
```

Definition at line 60 of file test_board.cpp.

7.13.2.15 TEST_CASE() [7/11]

```
TEST_CASE (
    "Create Board with negative neighborhoodRadius" )
```

Definition at line 8 of file test_board.cpp.

7.13.2.16 TEST_CASE() [8/11]

```
TEST_CASE (
    "Create Board with negative states" )
```

Definition at line 26 of file test_board.cpp.

7.13.2.17 TEST_CASE() [9/11]

```
TEST_CASE (
    "Create Board with neighborhoodRadius out of bounds" )
```

Definition at line 17 of file test_board.cpp.

7.13.2.18 TEST_CASE() [10/11]

```
TEST_CASE (
    "Create Board with states out of bounds" )
```

Definition at line 35 of file test_board.cpp.

7.13.2.19 TEST_CASE() [11/11]

```
TEST_CASE (
    "getSize returns correct size" )
```

Definition at line 99 of file test_board.cpp.

7.13.2.20 update()

```
board update ( )
```

7.13.3 Variable Documentation

7.13.3.1 board

```
auto board = Board(args)
```

Definition at line 165 of file test_board.cpp.

7.13.3.2 cells

```
auto cells = board.getCells()
```

Definition at line 169 of file test_board.cpp.

7.13.3.3 isIncludeCenter

```
args isIncludeCenter = false
```

Definition at line 162 of file test_board.cpp.

7.13.3.4 isMooreType

```
args isMooreType = false
```

Definition at line 163 of file test_board.cpp.

7.13.3.5 neighborhoodRadius

```
args neighborhoodRadius = 1
```

Definition at line 160 of file test_board.cpp.

7.13.3.6 shouldBeAlive

```
coords_vect_t shouldBeAlive
```

Definition at line 167 of file test_board.cpp.

7.13.3.7 shouldBeDead

```
coords_vect_t shouldBeDead
```

Definition at line 336 of file test_board.cpp.

7.13.3.8 shouldDecrease

```
coords_vect_t shouldDecrease
```

Definition at line 427 of file test_board.cpp.

7.13.3.9 states

```
args states = 2
```

Definition at line 161 of file test_board.cpp.

7.14 tests/test_GUI.py File Reference

Namespaces

- [tests.test_GUI](#)

Functions

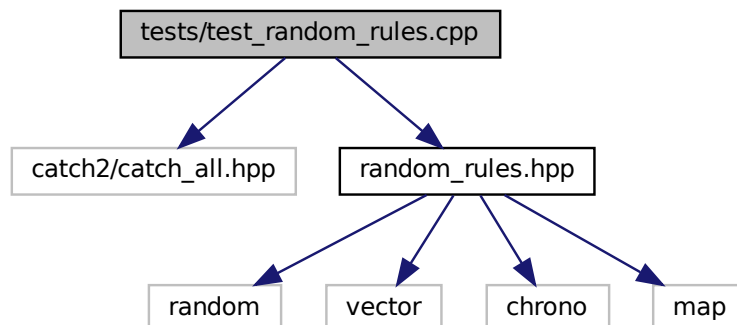
- [def tests.test_GUI.test_check_conditions \(\)](#)
- [def tests.test_GUI.test_check_conditions_error \(\)](#)
- [def tests.test_GUI.test_check_conditions_empty \(\)](#)
- [def tests.test_GUI.test_close_gui_change \(\)](#)
- [def tests.test_GUI.test_if_close \(\)](#)
- [def tests.test_GUI.test_set_close_after_set \(\)](#)
- [def tests.test_GUI.test_get_params_empty \(\)](#)
- [def tests.test_GUI.test_get_params_from_json \(\)](#)
- [def tests.test_GUI.test_get_params_not_empty \(\)](#)

7.15 tests/test_random_rules.cpp File Reference

```
#include <catch2/catch_all.hpp>
```

```
#include "random_rules.hpp"
```

Include dependency graph for test_random_rules.cpp:



Functions

- [TEST_CASE](#) ("Range greater than 0")
- [TEST_CASE](#) ("Range lower or equal 10")
- [TEST_CASE](#) ("Neighbourhood", "[!shouldfail]")
- [TEST_CASE](#) ("Middle included", "[!shouldfail]")
- [TEST_CASE](#) ("Number of [states](#) greater or equal 2")
- [TEST_CASE](#) ("Number of [states](#) lower or equal 255")
- [TEST_CASE](#) ("Birth or survive cond len greater than 0")
- [TEST_CASE](#) ("Birth or survive cond len lower or equal 10")
- [TEST_CASE](#) ("Birth or survive cond greater or equal 0")
- [TEST_CASE](#) ("Birth or survive cond lower than 10")

7.15.1 Function Documentation

7.15.1.1 TEST_CASE() [1/10]

```
TEST_CASE (
    "Birth or survive cond greater or equal 0" )
```

Definition at line 49 of file test_random_rules.cpp.

7.15.1.2 TEST_CASE() [2/10]

```
TEST_CASE (
    "Birth or survive cond len greater than 0" )
```

Definition at line 39 of file test_random_rules.cpp.

7.15.1.3 TEST_CASE() [3/10]

```
TEST_CASE (
    "Birth or survive cond len lower or equal 10" )
```

Definition at line 44 of file test_random_rules.cpp.

7.15.1.4 TEST_CASE() [4/10]

```
TEST_CASE (
    "Birth or survive cond lower than 10" )
```

Definition at line 57 of file test_random_rules.cpp.

7.15.1.5 TEST_CASE() [5/10]

```
TEST_CASE (
    "Middle included" ,
    "" [!shouldfail] )
```

Definition at line 22 of file test_random_rules.cpp.

7.15.1.6 TEST_CASE() [6/10]

```
TEST_CASE (
    "Neighbourhood" ,
    ""  [!shouldfail]  )
```

Definition at line 15 of file test_random_rules.cpp.

7.15.1.7 TEST_CASE() [7/10]

```
TEST_CASE (
    "Number of states greater or equal 2" )
```

Definition at line 29 of file test_random_rules.cpp.

7.15.1.8 TEST_CASE() [8/10]

```
TEST_CASE (
    "Number of states lower or equal 255" )
```

Definition at line 34 of file test_random_rules.cpp.

7.15.1.9 TEST_CASE() [9/10]

```
TEST_CASE (
    "Range greater than 0" )
```

Definition at line 5 of file test_random_rules.cpp.

7.15.1.10 TEST_CASE() [10/10]

```
TEST_CASE (
    "Range lower or equal 10" )
```

Definition at line 10 of file test_random_rules.cpp.

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