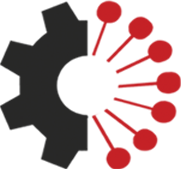
Project Report

**Computer Programming – II (MCT-243)**

**Minesweeper**

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# Project Abstract:

Very briefly describe your project. Different inputs, calculations, outputs etc.

Minesweeper’s objective is to clear a rectangular board containing hidden "[mines](https://en.wikipedia.org/wiki/Land_mine)" without detonating any of them, with help from clues about the number of neighbouring mines in each field.

# Class Hierarchy:

Show the class hierarchy via UML diagram showing class name and attributes, method signatures and links between different classes.

Class Gameattr

Object attributes

Rows, columns,mines  
(getter and setter methods)

Class Time

Class Grid

Class Start

Class GUI

Whileloop()

Create()

Created()

Window()

Nearbomb(x,y)

placebomb()

Setter()

counter()

createWindow()

CreateMenu()

Saveattr()

saveConfig()

Display(x,y)

Flag(x,y)

Setsize()

Gamepre()

Load Config()

Winner()

disabledButtons(x,y)

Detail of classes:

|  |  |  |  |
| --- | --- | --- | --- |
| Class1 Name  Gameattr() | Description of Attribute/Method | Purpose of Attribute/Method | Any other detail needed |
| Att1 | rows | No.of rows of our game window | Remains same for all the classes |
| Att2 | cols | No. of columns of our game window |  |
| Att3 | mines | No. of mines hidden in our window buttons |  |
| Method1 | Getter and setter method of rows |  |  |
| Method2 | Getter and setter method of columns |  |  |
| Method3 | Getter and setter method of mines |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Class2 Name  GUI(gameattr) | Description of Attribute/Method | Purpose of Attribute/Method | Any other detail needed |
| Method1 | Window() | Main window of game | Contains 2 buttons  (Start(the command is stored in a class start) and Exit) |
| Method2 | Setter() | Set the data attributes(rows,columns,mines) | Used by the class start to set the data attributes when switch to the next level or restart the game. |

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| --- | --- | --- | --- |
| Class2 Name  Grid(gameattr) | Description of Attribute/Method | Purpose of Attribute/Method | Any other detail needed |
| Method1 | Create() | Return the list of hidden values behind the window buttons | We call this method in class start |
| Method2 | placebomb() | Place the mines in list |  |
| Method3 | Nearbomb(x,y) | Place the clue numbers near the bomb in list |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Class2 Name  Start(gameattr) | Description of Attribute/Method | Purpose of Attribute/Method | Any other detail needed |
| Method1 | Created() | Method contains the whole game (Saveattr(),CreateMenu(),createWindow(),Time.counter()) |  |
| Method2 | Saveattr() | Set the rows , cols , mines update it in config.ini file whenever the player will change level of game the function will be called. | It sets the window size of level from where player left the last time. |
| Method3 | Createmenu() | Create the menu bar having (level,exit,restart) option buttons |  |
| Method4 | createWindow() | Place the buttons according to the given attributes(rows, cols) and flag and timer label. | Every button has a hidden value which get displayed and disabled when we click it. |
|  | saveConfig() | Sets the data attributes and write it in a config.ini file. |  |
|  | loadConfig() | Load or read data attributes from config file. |  |
|  | Setsize(r,c,m) | The method will be called when player wants to change the level. | It will set the data attributes , delete previous widgets except menu , save the data attributes and prepare new game. |
|  | Gamepre() | Delete the second window widgets except menu widgets and set the counter and flags. | Called when player want to restart or shift from level. |
|  | Display(x,y) | Display the value hidden behind the buttons and disable the button |  |
|  | Winner() | Return message box of congratulations if there is no mine left in the sol grid |  |
|  | Flag(x,y) | Flags are equal to no. of mines, if player put a flag and there is a mine hidden in a box then it will be replaced by ‘F’ in a solution grid list (named as board). |  |

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| --- | --- | --- | --- |
| Class1 Name  Time() | Description of Attribute/Method | Purpose of Attribute/Method | Any other detail needed |
| Method1(static) | Counter() | Used to create thread , execute function in parallel with other program. |  |
| Method2(static) | Whileloop() | Setting the thread to daemon (daemonic thread runs along with main program) | Set the counter label value. |

GUI:

|  |  |  |  |
| --- | --- | --- | --- |
| GUI Widget | Purpose | Connection with Program | Any other detail needed |
| Root window(Parent) | Allow the user to start or exit the game. | Defined in class GUI (start button allows to enter new window and contains the whole game) | Start button command is defined in a class sart |
| Top window(child) | Contains the whole game(Window contains menu bar, updating flag label and a counter. | Class start contains the whole logic of the top window. |  |
| Menu bar | Have levels, exit, reset buttons. | Level has three child widgets(Easy, Medium , High) …sets the data attributes defined for it in their command defined in createMenu() method of class start  Reset command defined in gamepre() method of class start | When player will change level or reset game it will destroy the previous window(gamepre() method defined in class start). |
| Labels and rest of the grid of window | Flag and counter label  Buttons grid in rest of window. | Flag label decrement by value 1 whenever player put a flag on any button defined in Flag(x,y)method of class start.  Counter label will increment value by 1 when the player will start the game and will stop when the game will end defined in class Time. |  |

Screen Shot of GUI

**Note🡪 The major purpose of the report is that the reader can get the visual detail of your project as much as possible.**

