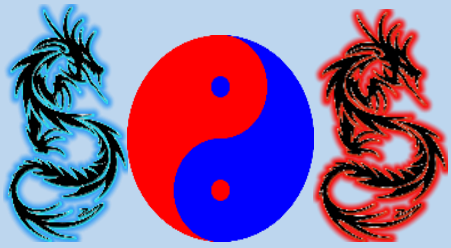
A

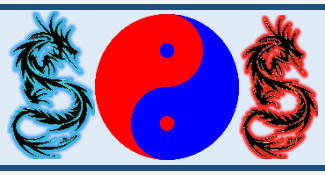
Documentation

Of the



Game

Ofentse and Mnotho



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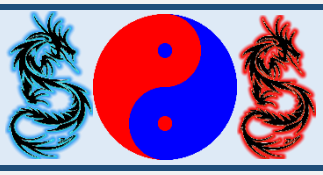


INTRODUCTION

This is a documentation for a project that required us to develop a two player game that had to be played online via an internet connection, the game that we had to develop is called SOS.SOS is a game like Tic Tac Toe but is more complex, SOS game is played on square grid with sixteen square inside the grid, the aim of the game is to create a straight sequence S-O-S among connected squares in a grid.

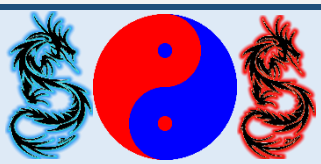
On this document we will explain:

- **Project management**
- **Design of the game**
- **Implementations**
- **Testing**
- **Enhancements**
- **Future Work**

PROJECT MANAGEMENT

PROJECT PLAN and TEAM WORK:

We drafted a time table to schedule our work accordingly So that we do not miss deadlines and due dates .On the time table each team member was allocated a specific task for a specific date.



Time table for the Project plan:

Number	Task	Who	Duration	Start	End
1.	Text-Based Client	Mnotho and Ofentse	7 Days	13 April	20 April
1.1	Creating the display_board method, that deals with displaying the SOS board.	Mnotho and Ofentse	2 Days	13 April	15 April
1.2	Creating the handle_message method , firstly modifying it to notify when a new game is started.	Ofentse	2 hours	15 April	15 April
1.3	Modifying the handle_message method to check if the move a player made is valid or invalid and displaying a proper message .	Mnotho	2 hours	15 April	15 April
Number	Task	Who	Duration	Start	End
1.4	Modifying the handle message method to check and notify the players when the game is over.	Ofentse	2 hours	17 April	17 April

1.5	Modifying the method to check if the player wants to stop playing and terminate the program and display an appropriate method.	Mnotho	3 hours	18 April	18 April
2.	GUI Prototype	Mnotho and Ofentse	7 days	20 April	27 April
2.1	Low-fidelity prototype. Here We'll basically do a rough drawing of what our interface will look like, on a paper. Having combined ideas.	Mnotho and Ofentse	1 hour	20 April	20 April
2.2	Consulting our team leader, Michael January about our low-fidelity prototype.	Mnotho and Ofentse	2 hours	21 April	21 April
2.3	Starting with the high-fidelity prototype, the basic window operations, the resizing, the server text field and label	Ofentse	1 hour	22 April	22 April
2.4	Adding the connect/disconnect button, quit/exit button, text area for server messages	Mnotho	3 hours	23 April	23 April
2.5	Adding some more features, tuning the GUI	Ofentse And Mnotho	2 hours	24 April	24 April
Number	Task	Who	Duration	Start	End

3	Final System Alpha	Mnotho and Ofentse	7 days	27 April	04 May
3.1	Get 5 people to fill out the questionnaire and use the feedback in a User Testing document.	Micheal,2 CSC1011H students and 2 non-CSC1011H students	2 days	27April	29 April
3.2	Implementing the GUI.	Ofentse	4 hours	28 April	28 April
3.3	Writing code to allow both users to connect if they request to(i.e clicking connect)	Mnotho and Ofentse	8 hours	29 April	29 April
3.4	Modifying the interface such that it handles the new game message properly	Ofentse	1 days	30 April	30 May
3.5	Creating an external thread for the play loop method so it won't conflict with the PyQt event loop and also testing the last things modified	Mnotho	2 days	1 April	3 April
4.	Final System Beta	Mnotho and Ofentse	7 days	04May	11 May
4.1	Writing an SOS game GUI client.	Mnotho	1 day	04 may	05 May

4.3	Testing the game by playing a few games and see if it works accordingly and debugging where necessary	Mnotho	12 hours	07 May	07 May
4.4	Mnotho and Ofentse, each one of them implementing two separate features	Mnotho and Ofentse	2 days	08 May	10 May
4.5	Test if the new features are properly working.	Ofentse	4 hours	10 May	10 May
5	Final Report	Mnotho and Ofentse	7 days	11 May	18 May
5.1	Starting the final report, beginning with the Introduction.	Mnotho and Ofentse	1 day	11 May	12 May
5.2	This section is about how the project was managed and the experience with working with my partner.	Mnotho and Ofentse	2 days	13 May	15May
Number	Task	Who	Duration	Start	End
5.3	Summarizing main points in the report	Mnotho And Ofentse	5hours	16 May	17May

5.4	Rehearsing a project presentation	Mnotho And Ofentse	1 day	16 May	17May
5.5	Possible enhancements that could add to user experience.	Mnotho	8 hours	17 may	17may

Team Work:

The experience of us two working as a team wasn't good. We experienced so many problems, delays and disagreements. It's changed how we view working in groups but after all the project was u success.

DESIGN:

Software Design:

Python 3.4 and PYQT4 were used to develop the SOS game, since our game had to be played via an internet connection, we choose to use the STOMP {Simple/Streaming Text Oriented Messaging Protocol} because it text based and more simple and easier to use

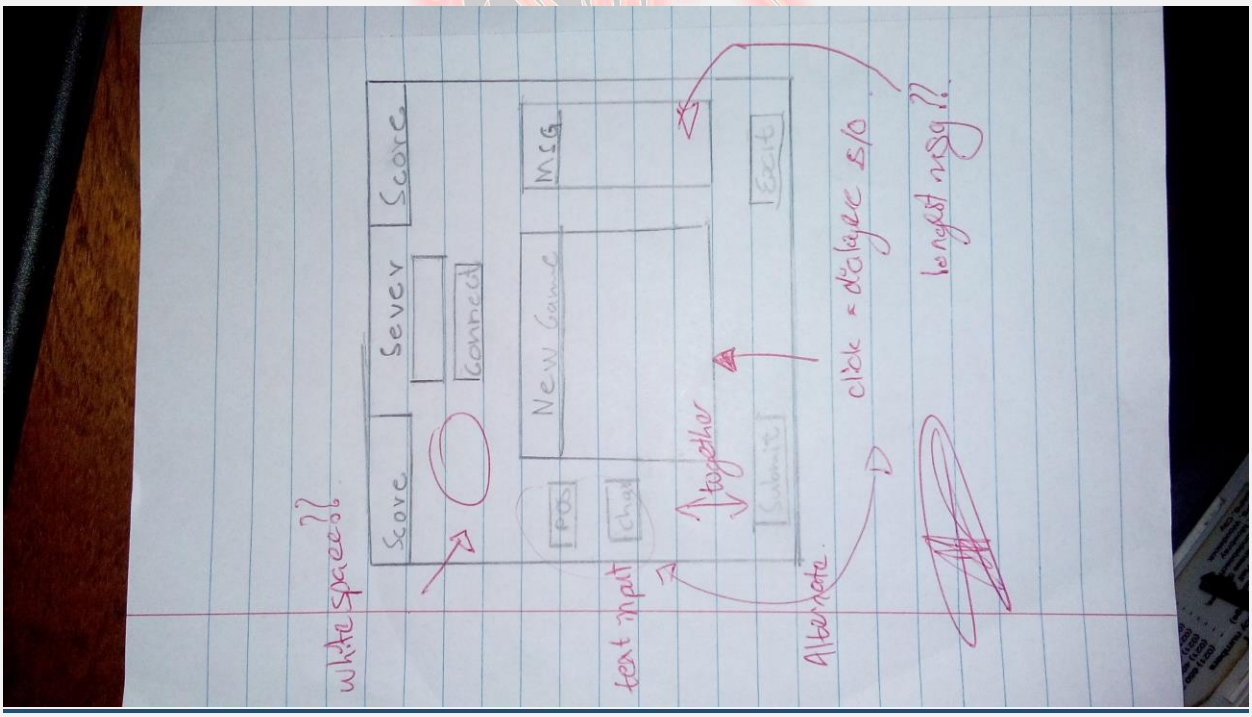
Gui Design:

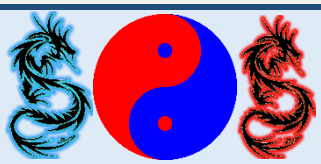
The Gui had three development stages ,the low fidelity prototype which was a simple user interface with a basic layout for SOS game but it no dynamic functionality for the game to run , the high fidelity prototype ,for the high fidelity prototype most the features from low fidelity prototype design where unchanged but a lot of features we added to it to it to make the design run the sos game in the background while it updates the user interface

DESIGN IMPLEMENTATIONS:

Low Fidelity:

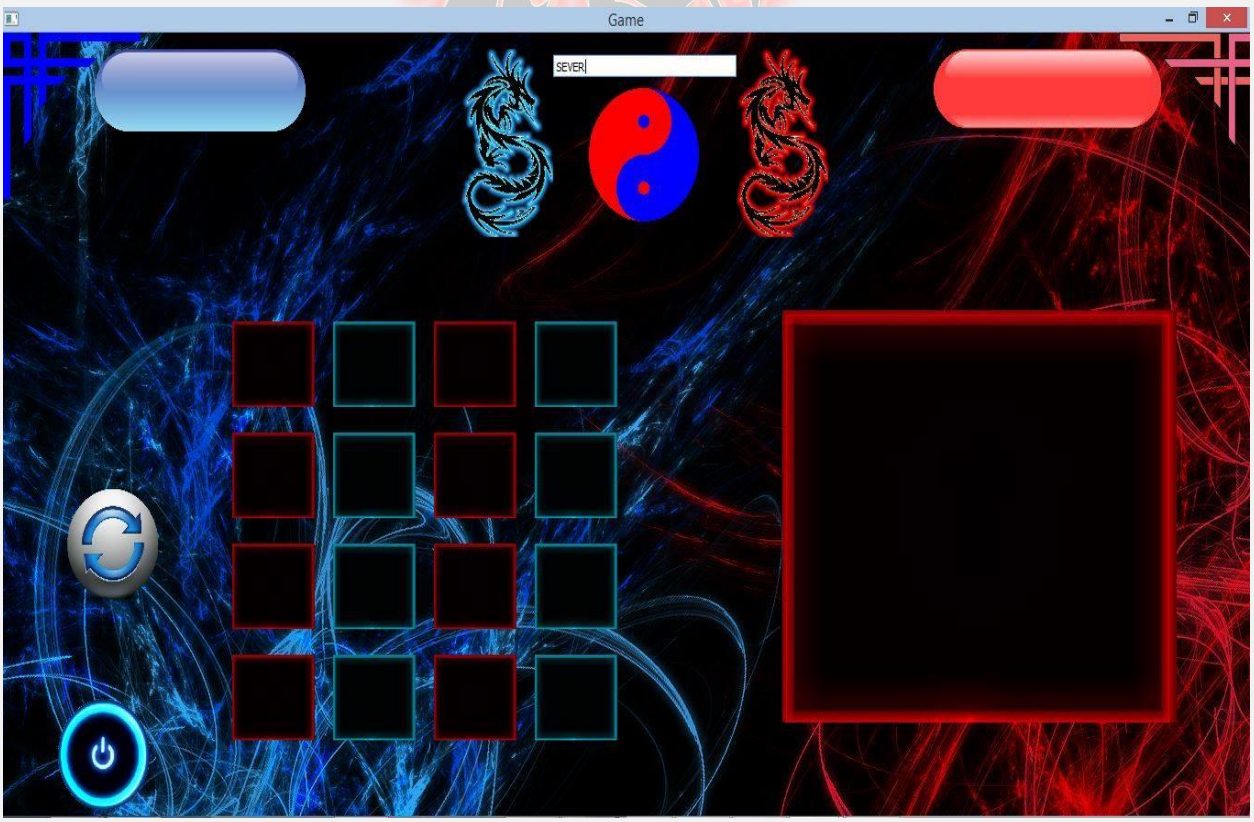
This is our low fidelity GUI ,our aim was to optimize the GUI for touch enabled desktop users and keyboard users ,the draft shows a simple layout with combo boxes, line edit and buttons





High Fidelity GUI:

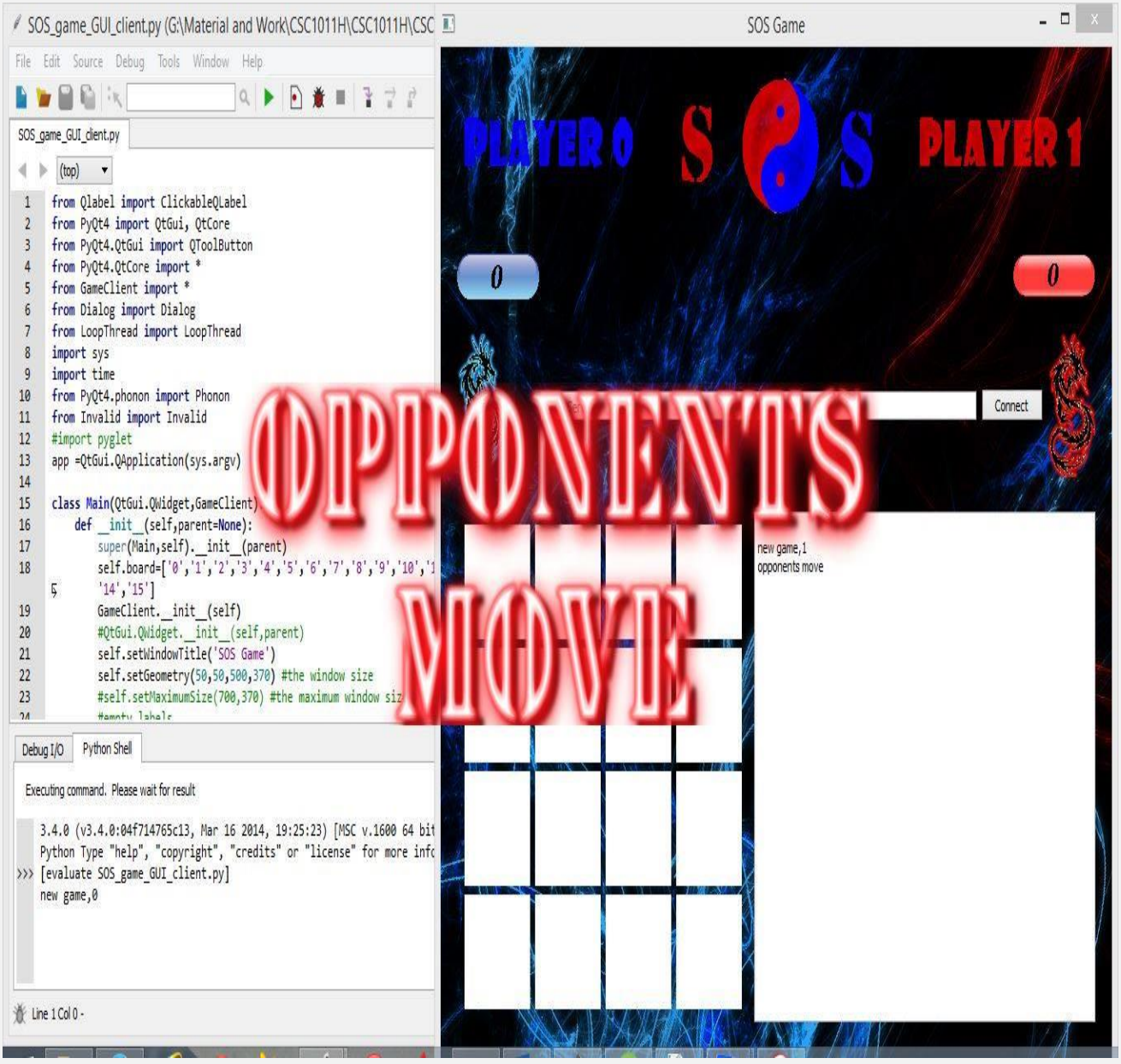
The high fidelity GUI was meant to show a simple SOS game user interface layout but without the game running .all the features from the low fidelity from GUI were but the combo boxes were removed from the interface so that it simple looking yet more user friendly. A theme of red against blue was used that inspired by Chinese traditional art.

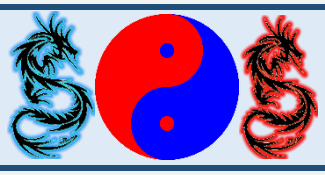


The GUI had some minor issues, absolute positioning was used so the GUI was not adjustable and it could only run only on full screen mode.

Final GUI Design:

On our final GUI Design we had lot of changes that were implemented the .Labels were added, the play again button was removed but the theme was kept the same





TESTING:

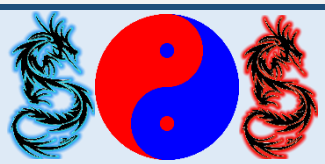
Development testing:

Each time a new feature was implemented on code for the GUI and the SOS game functionality it was tested, for example, when the sound feature was added to GUI for the first time it could not play because an external python module was used, the solution to the problem was to use a PyQT4 build in media play module called phonon

User Testing:

Most of the users had problems using the high fidelity GUI because it did not have any labels to explain what it is happening or what is expected from them, most of them had negative comments about the functionality of high fidelity GUI but they had positive comments about theme of Layout.

After user testing comments were reviewed, changes were implemented on the GUI to enhance user experience then we gave a second round of testing for the users to enjoy themselves ,We had positive comments from users after that because the help button for instruction on how to use the GUI were there and labels were also added.



ENHANCEMENTS:

- **Sound (PHONON): for notifications**
- **Clickable Images(MousePressedEvent): for the gameplay**
- **Flash plash: for notifications**
- **Massage box : for alerts (if what to quit the game)**
-

Future enhancement:

- **Animations for more user interaction**
- **Multiple player mode(more than two players to players)**
- **Multiple themes**

CONCLUSION:

The project was an SOS game. The game was basically for use with a mouse, the formation of SOS's. The road to getting the project done was indeed long and the team had a lot of difficulties and issues. Through it all, the game was finished and it was quite a learning experience.

APPENDENCES:

```
from Qlabel import ClickableQLabel
from PyQt4 import QtGui, QtCore
from PyQt4.QtGui import QToolButton
from PyQt4.QtCore import *
from GameClient import *
from Dialog import Dialog
from LoopThread import LoopThread
import sys
import time
from PyQt4.phonon import Phonon
from Invalid import Invalid
#import pyglet
app =QtGui.QApplication(sys.argv)


class Main(QtGui.QWidget,GameClient):
    def __init__(self,parent=None):
        super(Main,self).__init__(parent)
        self.board=['0','1','2','3','4','5','6','7','8','9','10','11','12','13','14','15']
        GameClient.__init__(self)
        #QtGui.QWidget.__init__(self,parent)
        self.setWindowTitle('SOS Game')
```

```
        self.setGeometry(50,50,500,370) #the window size
        #self.setMaximumSize(700,370) #the maximum window size
        #empty_labels
        self.how_to_label=QtGui.QLabel('')
        self.empty2=QtGui.QLabel('')

        #pop up buttons to click when you want to play
        self.st=QtGui.QPixmap("S")
        self.st= self.st.scaled(150, 200, QtCore.Qt.KeepAspectRatio)
        self.sd=QtGui.QLabel(self)
        self.sd.setPixmap(self.st)



        self.so=QtGui.QPixmap("O")
        self.so= self.so.scaled(150, 200, QtCore.Qt.KeepAspectRatio)
        self.sdo=QtGui.QLabel(self)
        self.sdo.setPixmap(self.so)

        self.grid2=QtGui.QGridLayout()
        self.grid2.addWidget(self.sd,0,0) #adding the buttons to be clicked on the
grid
        self.grid2.addWidget(self.sdo,0,1)
        self.grid2wid=QtGui.QWidget()
        self.grid2wid.setLayout(self.grid2)
```

```
        #background
        self.picture = QtGui.QPalette(self) # Background image
        self.picture.setBrush(QtGui.QPalette.Background,
                              QtGui.QBrush(QtGui.QPixmap("back.jpg")))


        self.setPalette(self.picture)


        #layouts
        self.grid_one=QtGui.QGridLayout() #the grid layout for images,S, O
        self.vbox_1=QtGui.QVBoxLayout()
        self.score_hbox=QtGui.QHBoxLayout() #the hbox layout for the scores
        self.conn_hbox=QtGui.QHBoxLayout() #the hbox for the server label, line edit
and the button
        self.grid_vbox1_layout=QtGui.QHBoxLayout() #the layout for the grid_one
and vbox1 widgets
        self.bottom_hbox=QtGui.QHBoxLayout() #the hbox layout for the bottom
part, for the buttons (shut and play)
        self.top_hbox=QtGui.QHBoxLayout() #the upper most hbox layout
        self.edit_box=QtGui.QTextEdit()
        self.main_layout=QtGui.QVBoxLayout()


        #Labels
        self.server=QtGui.QLabel("Server")
        self.position=QtGui.QLabel("Position")
        self.character=QtGui.QLabel("Character")
```

```
        self.score0=QtGui.QLabel("Player0:")
        self.score1=QtGui.QLabel("Player1:")
        self.drag_1=QtGui.QLabel() #blue dragon
        self.drag_2=QtGui.QLabel() #red dragon
        self.score_zero=QtGui.QLabel()
        self.score_one=QtGui.QLabel()
        self.top_left_dec=QtGui.QLabel()
        self.top_right_dec=QtGui.QLabel()
        self.sides_label=QtGui.QLabel()

        self.shut_label=QtGui.QLabel()
        self.shut_pix = QtGui.QPixmap("Close.png")
        self.shut_label.setPixmap(self.shut_pix) #the label next to the shutting down
button will be a close image

       # self.shut_label.setAutoFillBackground(True)

        self.play_again_label=QtGui.QLabel()
        self.play_a_pix=QtGui.QPixmap("PlayAgain.png")
        self.play_again_label.setPixmap(self.play_a_pix) #the label next to this one
will be a play_again image

        #text boxes
        self.pos_field=QtGui.QLineEdit()
        self.char_field=QtGui.QLineEdit()
```

```
        self.server_field=QtGui.QLineEdit()
        self.server_field.setPlaceholderText("Enter Server")
        #images/pixmaps

        self.S_pix = QtGui.QPixmap('S.gif').scaled(80, 80, QtCore.Qt.KeepAspectRatio)
#the S image, scaled to be a bit bigger
        self.O_pix = QtGui.QPixmap('O.gif').scaled(80, 80,
QtCore.Qt.KeepAspectRatio) #the O image
        self.Blank = QtGui.QPixmap('blank.gif').scaled(80, 80,
QtCore.Qt.KeepAspectRatio) #the blank image
        self.dragon_blue=QtGui.QPixmap("TribalBlue.png").scaled(100, 100,
QtCore.Qt.KeepAspectRatio) #a pixmap with the dragon image that has been
resized to fit in thewindow
        self.player_div=QtGui.QPixmap("Heading_11.png").scaled(1200, 100,
QtCore.Qt.KeepAspectRatio) #this image allocates to you the sides of the players
        self.red_dec=QtGui.QPixmap("redc.png").scaled(70, 70,
QtCore.Qt.KeepAspectRatio) #the red corner decoration
        self.blue_dec=QtGui.QPixmap("bluec.png").scaled(70, 70,
QtCore.Qt.KeepAspectRatio) #the blue corner decoration

        self.dragon_red=QtGui.QPixmap("TribalRed.png").scaled(100, 100,
QtCore.Qt.KeepAspectRatio) #same here, but with the red dragon
        self.drag_1.setPixmap(self.dragon_blue)
        self.drag_2.setPixmap(self.dragon_red)
        self.top_left_dec.setPixmap(self.blue_dec)
        self.top_right_dec.setPixmap(self.red_dec)
        self.sides_label.setPixmap(self.player_div)
```

```
        #player zero scores



        '''Score_PlayerNumber_Score'''


        self.score_0_0 = QtGui.QPixmap("recblue_0.png").scaled(100, 100,
QtCore.Qt.KeepAspectRatio) #the blue record image, score_(player)0_score(0)

        self.score_0_1 = QtGui.QPixmap("recblue_1.png").scaled(100, 100,
QtCore.Qt.KeepAspectRatio) #player 0 score pixmap when the score is 1

        self.score_0_2 = QtGui.QPixmap("recblue_2.png").scaled(100, 100,
QtCore.Qt.KeepAspectRatio)

        self.score_0_3 = QtGui.QPixmap("recblue_3.png").scaled(100, 100,
QtCore.Qt.KeepAspectRatio)

        self.score_0_4 = QtGui.QPixmap("recblue_4.png").scaled(100, 100,
QtCore.Qt.KeepAspectRatio)

        self.score_0_5 = QtGui.QPixmap("recblue_5.png").scaled(100, 100,
QtCore.Qt.KeepAspectRatio)

        self.score_0_6 = QtGui.QPixmap("recblue_6.png").scaled(100, 100,
QtCore.Qt.KeepAspectRatio)

        self.score_0_7 = QtGui.QPixmap("recblue_7.png").scaled(100, 100,
QtCore.Qt.KeepAspectRatio)

        self.score_0_8 = QtGui.QPixmap("recblue_8.png").scaled(100, 100,
QtCore.Qt.KeepAspectRatio)


        #the score: pixmap dictionary for player0 scores
```

'''The score is the key and the pixmap is the value, this will be used for displaying the score for each player based on the score they have'''

self.p0_scores = { 0:self.score_0_0 , 1:self.score_0_1 , 2: self.score_0_2 , 3: self.score_0_3 , 4:self.score_0_4 , 5:self.score_0_5, 6:self.score_0_6, 7:self.score_0_7, 8:self.score_0_8}

#player one scores

'''Score_PlayerNumber_Score'''

self.score_1_0=QtGui.QPixmap("recred_0.png").scaled(100, 100, QtCore.Qt.KeepAspectRatio) #the red record image, the same as the above scores pixmpas

self.score_1_1=QtGui.QPixmap("recred_1.png").scaled(100, 100, QtCore.Qt.KeepAspectRatio) #the red record image

self.score_1_2=QtGui.QPixmap("recred_2.png").scaled(100, 100, QtCore.Qt.KeepAspectRatio)

self.score_1_3=QtGui.QPixmap("recred_3.png").scaled(100, 100, QtCore.Qt.KeepAspectRatio)

self.score_1_4=QtGui.QPixmap("recred_4.png").scaled(100, 100, QtCore.Qt.KeepAspectRatio)

self.score_1_5=QtGui.QPixmap("recred_5.png").scaled(100, 100, QtCore.Qt.KeepAspectRatio)

self.score_1_6=QtGui.QPixmap("recred_6.png").scaled(100, 100, QtCore.Qt.KeepAspectRatio)

self.score_1_7=QtGui.QPixmap("recred_7.png").scaled(100, 100, QtCore.Qt.KeepAspectRatio)

```
        self.score_1_8=QtGui.QPixmap("recred_8.png").scaled(100, 100,
QtCore.Qt.KeepAspectRatio)


        #the score: pixmap dictionary for player1 scores
        '''The score is the key and the pixmap is the value, this will be used for
displaying the score for each player based on the score they have'''


        self.p1_scores = { 0:self.score_1_0 , 1:self.score_1_1 , 2: self.score_1_2 , 3:
self.score_1_3 , 4:self.score_1_4 , 5:self.score_1_5, 6:self.score_1_6,
7:self.score_1_7, 8:self.score_1_8} #each and every score with it's corresponding
pixmap


        #the scores images initially to be both zero
        self.score_zero.setPixmap(self.score_0_0)
        self.score_one.setPixmap(self.score_1_0) #setting the pixmaps accordingly


        ##zero1= 0,1, zero0=0,0 , their positions as they will be put in the grid##


        '''I used the Qlabel class to make these buttons clickable'''
        #first row
        self.zero0 = ClickableQLabel(self) #clickable labels to hold pixmap,
        self.zero1 = ClickableQLabel(self) #"      "  "     "     topmiddle
        self.zero2 = ClickableQLabel(self)
        self.zero3 = ClickableQLabel(self)


        #second row
```

```
        self.one0 = ClickableQLabel(self)
        self.one1 = ClickableQLabel(self)
        self.one2 = ClickableQLabel(self)
        self.one3 = ClickableQLabel(self)

        #third row
        self.two0 = ClickableQLabel(self)
        self.two1 = ClickableQLabel(self)
        self.two2 = ClickableQLabel(self)
        self.two3 = ClickableQLabel(self)

        #fourth row
        self.three0 = ClickableQLabel(self)
        self.three1 = ClickableQLabel(self)
        self.three2 = ClickableQLabel(self)
        self.three3 = ClickableQLabel(self)


        #the list of these labels:
        self.empty_labels= [ self.zero0, self.zero1 , self.zero2 , self.zero3 , self.one0
,self.one1 , self.one2 ,self.one3 , self.two0 ,self.two1 , self.two2 , self.two3 ,
self.three0 , self.three1, self.three2, self.three3 ]
        '''These are all the empty clickable image labels'''
```

```
        #buttons
        self.connect_button=QtGui.QPushButton("Connect")
        self.play_pix=QtGui.QPixmap("play_again.png").scaled(70, 70,
QtCore.Qt.KeepAspectRatio)
        #self.play_again=ClickableQLabel(self)
        #self.play_again.setPixmap(self.play_pix)

        #the shut button for closing the game ang the how to play
        self.how_to_button=ClickableQLabel(self)
        self.how_to_pix=QtGui.QPixmap("HowToPlay.png").scaled(100, 100,
QtCore.Qt.KeepAspectRatio) #the how_to_play button / image
        self.how_to_button.setPixmap(self.how_to_pix)

        self.shut_button=ClickableQLabel(self) #the button(image)for closing the
game
        self.shut_pix=QtGui.QPixmap("shut.png").scaled(70, 70,
QtCore.Qt.KeepAspectRatio)
        self.shut_button.setPixmap(self.shut_pix)

        self.how_to_lpix=QtGui.QPixmap("HowTo.png").scaled(250, 100,
QtCore.Qt.KeepAspectRatio) #the pixmap for the how to play label image
        self.how_to_label.setPixmap(self.how_to_lpix)

        '''Adding widgets to layouts'''

        #top_hbox
```

```
        # self.top_hbox.addWidget(self.empty1) #empty labels to place the image in the middle
        self.top_hbox.addWidget(self.sides_label)
        self.top_hbox.addWidget(self.empty2)
        self.top_hbox.addStretch(100)

        #shutdown hbox, for the shutdown button
        #self.bottom_hbox.addWidget(self.play_again) #button
        #self.bottom_hbox.addWidget(self.play_again_label) #play again label
        self.bottom_hbox.addWidget(self.shut_button) #button
        self.bottom_hbox.addWidget(self.shut_label) #shut down game label
        self.bottom_hbox.addWidget(self.how_to_button)
        self.bottom_hbox.addWidget(self.how_to_label)
        self.bottom_hbox.addStretch(150)

        #adding widgets to the grid_one layout
        self.grid_one.addWidget(self.zero0,0,0) #adding the blank images to their corresponding positions
        self.grid_one.addWidget(self.zero1,0,1)
        self.grid_one.addWidget(self.zero2,0,2)
        self.grid_one.addWidget(self.zero3,0,3)

        #row 2
        self.grid_one.addWidget(self.one0,1,0)
        self.grid_one.addWidget(self.one1,1,1)
```

```
        self.grid_one.addWidget(self.one2,1,2)
        self.grid_one.addWidget(self.one3,1,3)

        #row3
        self.grid_one.addWidget(self.two0,2,0)
        self.grid_one.addWidget(self.two1,2,1)
        self.grid_one.addWidget(self.two2,2,2)
        self.grid_one.addWidget(self.two3,2,3)

        #row4
        self.grid_one.addWidget(self.three0,3,0)
        self.grid_one.addWidget(self.three1,3,1)
        self.grid_one.addWidget(self.three2,3,2)
        self.grid_one.addWidget(self.three3,3,3)

        #conn_hbox
        self.conn_hbox.addWidget(self.drag_1)
        self.conn_hbox.addWidget(self.server) #the server label
        self.conn_hbox.addWidget(self.server_field) #the line edit for entering the IP
adress
        self.conn_hbox.addWidget(self.connect_button)
        self.conn_hbox.addWidget(self.drag_2)



        #score_hbox
```

```
        #self.score_hbox.addWidget(self.score0)
        self.score_hbox.addWidget(self.score_zero)
        #self.score_hbox.addWidget(self.score1)
        self.score_hbox.addStretch(40)
        self.score_hbox.addWidget(self.score_one)
        #self.score_one.setText("NIl")



        '''layout widgets'''
        '''Here we take a layout and put it as a widget so it could be added to another layout'''
        #the top hbox
        self.top_hbox_wid=QtGui.QWidget()
        self.top_hbox_wid.setLayout(self.top_hbox)

        #for the shut and play again buttons
        self.bottom_hbox_wid=QtGui.QWidget()
        self.bottom_hbox_wid.setLayout(self.bottom_hbox)

        #grid_one
        #the grid with the images
        self.grid_one_wid=QtGui.QWidget() #the grid widget
        self.grid_one_wid.setLayout(self.grid_one)      #setting the layout to be grid_one
```

```
#vbox1

self.vbox1_wid=QtGui.QWidget() #the vbox1
self.vbox1_wid.setLayout(self.vbox_1) #making vbox1 layout a widget

#bottom_hbox
#self.top_hbox_wid=QtGui.QWidget()
#self.top_hbox_wid.setLayout(self.top_hbox) #same thing here

#conn_hbox
self.conn_hbox_wid=QtGui.QWidget()
self.conn_hbox_wid.setLayout(self.conn_hbox)

#score_hbox
self.score_hbox_wid=QtGui.QWidget()
self.score_hbox_wid.setLayout(self.score_hbox)

#adding the vbox1 and grid_one layout widgets to their hbox,
'''I added the text edit box instead of the vbox1'''

#this one takes the layout widgets and adds them

self.grid_vbox1_layout.addWidget(self.grid_one_wid)
```

```
        self.grid_vbox1_layout.addWidget(self.edit_box)


        #grid_vbox1_layout
        self.grid_vbox1_layout_wid=QtGui.QWidget() #the same layouts out with other layout widgets is made a widget for, so we could add it to the main layout
        self.grid_vbox1_layout_wid.setLayout(self.grid_vbox1_layout)



        '''The main layout'''

        #adding the other layouts(widgets) to the main Vbox layout

        self.main_layout.addWidget(self.top_hbox_wid)

        self.main_layout.addWidget(self.score_hbox_wid)

        self.main_layout.addWidget(self.conn_hbox_wid)

        self.main_layout.addWidget(self.grid_vbox1_layout_wid)

        self.main_layout.addWidget(self.bottom_hbox_wid)

        self.setLayout(self.main_layout)
```

```
#connecting to the server
self.connect_button.clicked.connect(self.Connect_client)



#if zero1 is clicked, then the zero1_Clicked() method will be called

#connections to be modified
self.connect(self.zero0, SIGNAL('clicked()'), self.Clicked_zero0)
self.connect(self.zero1, SIGNAL('clicked()'), self.Clicked_zero1)
self.connect(self.zero2, SIGNAL('clicked()'), self.Clicked_zero2)
self.connect(self.zero3, SIGNAL('clicked()'), self.Clicked_zero3)

self.connect(self.one0, SIGNAL('clicked()'), self.one0_Clicked)
self.connect(self.one1, SIGNAL('clicked()'), self.one1_Clicked)
self.connect(self.one2, SIGNAL('clicked()'), self.one2_Clicked)
self.connect(self.one3, SIGNAL('clicked()'), self.one3_Clicked)

#row3 connections
self.connect(self.two0, SIGNAL('clicked()'), self.two0_Clicked)
self.connect(self.two1, SIGNAL('clicked()'), self.two1_Clicked)
self.connect(self.two2, SIGNAL('clicked()'), self.two2_Clicked)
self.connect(self.two3, SIGNAL('clicked()'), self.two3_Clicked)

#row4 connections
```

```
        self.connect(self.three0, SIGNAL('clicked()'), self.three0_Clicked)
        self.connect(self.three1, SIGNAL('clicked()'), self.three1_Clicked)
        self.connect(self.three2, SIGNAL('clicked()'), self.three2_Clicked)
        self.connect(self.three3, SIGNAL('clicked()'), self.three3_Clicked)


        #other buttons connection
        self.connect(self.shut_button, SIGNAL('clicked()'), self.shut_win) #when the shut button is clicked, the shut_win module is ran
        self.connect(self.how_to_button, SIGNAL('clicked()'), self.how_to_play)




        #the play thread


        self.mess_thread = LoopThread() #the threat object
        self.mess_thread.message_signal.connect(self.handle_message) #connecting the signal to the handle_message method


    def play_sound(self,clip): #plays the clicked sound
        self.mediaObject = Phonon.MediaObject(self)
        self.audioOutput = Phonon.AudioOutput(Phonon.MusicCategory, self)
        Phonon.createPath(self.mediaObject, self.audioOutput)
        #  self.mediaObject.stateChanged.connect(self.handleStateChanged)
```

```
        self.mediaObject.setCurrentSource(Phonon.MediaSource(clip))
        self.mediaObject.play()

    #this function shows the message whether it's your move
    def show_msg(self,pic,showtime):

        self.splash = QtGui.QSplashScreen(QtGui.QPixmap(pic))

        # SplashScreen will be in the center of the screen by default.

        self.splash.show()

        # Close the SplashScreen after the specified secs (ms)
        QtCore.QTimer.singleShot(showtime, self.splash.close)



    def clear_interface(self): #this method clears the images and set them to blank
        #the list of the clickable labels just incase i want to aplly something to all of
them

        '''setting the initial scores'''
        self.score_zero.setPixmap(self.score_0_0)
        self.score_one.setPixmap(self.score_1_0)
        '''reseting all the pixmaps to blank'''
        #row1
```

```
self.zero0.setPixmap(self.Blank)
self.zero1.setPixmap(self.Blank)
self.zero2.setPixmap(self.Blank)
self.zero3.setPixmap(self.Blank)

#row2
self.one0.setPixmap(self.Blank)
self.one1.setPixmap(self.Blank)
self.one2.setPixmap(self.Blank)
self.one3.setPixmap(self.Blank)

#row3
self.two0.setPixmap(self.Blank)
self.two1.setPixmap(self.Blank)
self.two2.setPixmap(self.Blank)
self.two3.setPixmap(self.Blank)

#row4
self.three0.setPixmap(self.Blank)
self.three1.setPixmap(self.Blank)
self.three2.setPixmap(self.Blank)
self.three3.setPixmap(self.Blank)

#adding the blank to all the labels initially
```

```
    def Connect_client(self):


        self.mess_thread.connecter(self.server_field.displayText()) #connecting using the thread because the connection is a loop on it's own
        self.server_field.setText('')
        self.clear_interface() #not neccessary cause new game will do this
        self.mess_thread.start() #start the playloop
        self.show_msg("Connected.png",1500) #show the connected image for 1.5 s
        self.play_sound("Connected.wav")  #play the connected sound




    #row1
    def how_to_play(self):


        QtGui.QMessageBox.information(self, "SOS game", "SOS is a game similar to tic-tac-toe, where by you fill in boxes with either S or O to make the word SOS, which gives you a point. The player with the most points is a winner.\nHow to play: To make a move, you click on an empty box (white) and then click either an \'s\' or an \'o\' to play." )
        #some information about how to play


    def handle_message(self,msg):
```

```
        print(msg)
        self.edit_box.setText( self.edit_box.toPlainText() + "\n" + msg) #displaying the server messages on the text edit
        self.checking=msg



        if msg[:3]=="new": #if the first 3 ketters of msg are 'new' , then we have a 'new game,N' message.. that tells us that it's a new game

            #clearing the board
            self.clear_interface()
            #QtGui.QMessageBox.information(self, "SOS", "A new has started.\nHINT: Click on a box to make a move" )
            self.show_msg('NewGame.png',1000)


        if msg=="your move": #if the server sends me that it's my move
            print(msg)
            time.sleep(1) #wait for a second before a notification
            ##QtGui.QMessageBox.information( self, "SOS", "Your Move" ) #a dialog that tells you that it's your move
            self.show_msg('YourMove.png',1500) #show the your move picture


        if msg[:9]=="opponents": #if the server sent 'opponents move', we know it's the opponents move
```

```
            #Tell the user it's the other players move
            self.show_msg('OpponentsMove.png',1500)
            time.sleep(1)

        if msg[:3]=="gam":

            self.show_msg("GameOver_note.png",2000) #show that it's game over
            self.split_msg= msg.split(',') # now we havethe message as a list
[GameOver,W,S0,S1], W- For the winner, S0- Player0 score, S1- Player1 score

            S0=self.split_msg[2] #player1's score
            S1=self.split_msg[3] #player2's score
            Winner=self.split_msg[1]
            time.sleep(1.5)

            if Winner=="T": #T is sent when it's a tie, so we'll print it to both the clients
that it's tie
                self.show_msg("Tie.png",3000)
                time.sleep(1.5)

            elif Winner =="0":
                self.show_msg('Player0_wins.png',3000)
                time.sleep(1.5)
```

```
        elif Winner == "1":
            self.show_msg('Player1_wins.png',3000)
            time.sleep(1.5)

    if msg[:5]=="valid": #if the first FIVE  elements of the string are 'valid', we know that it's valid move so we further proceed

        self.msg_list=msg.split(',') # we have a list, [valid move,P,C,S1,S2]
        self.P = self.msg_list[1] #the position
        #print(self.P)
        self.C = self.msg_list[2] #the charactor
        #print(self.C)
        self.board[int(self.P)] = str(self.C) #replace the charactor in the specified position in the list with the specified charactor


        S0=self.msg_list[3] #player0's score
        S1=self.msg_list[4] #player1's score

        if self.C=="S": #if the character was S
                self.empty_labels[int(self.P)].setPixmap(self.S_pix)

        elif self.C=="O": # if the character was O
                self.empty_labels[int(self.P)].setPixmap(self.O_pix) #change the image to O
```

```
            #print('\n')
            #print("Player 0:",S0)
            #print("Palyer 1:",S1)
```

self.score_zero.setPixmap(self.p0_scores[int(S0)]) #displaying the appropiate score, by taking the score and getting the corresponding pixmap from the scores dictionary

self.score_one.setPixmap(self.p1_scores[int(S1)]) #same here

if msg == "invalid move": #if the move is considered to be invalid by the server, then We'll notify the user

```
            self.play_sound("invalid_move.wav")
            QtGui.QMessageBox.information( self, "SOS", "Invalid move. Please try a different position." ) #a dialog that tells you that it's an invalid move
            #a dialog that tells you that it's your move

            #self.show_msg('Invalidmove.png',1500)
```

if msg[:4] =='play': #now we know we have to prompt users to play a new game

```
        #QtGui.QMessageBox.information( self, "SOS", "Game Over \n\n(Press Play
Again to restart)" )

        reply = QtGui.QMessageBox.question(None,'SOS','Do you want to play
again?',QtGui.QMessageBox.Yes, QtGui.QMessageBox.No)


        if reply == QtGui.QMessageBox.Yes:

            self.mess_thread.message_sender("y") #send a yes if the user wants to
play again


        elif reply== QtGui.QMessageBox.No:

            self.mess_thread.message_sender("n") #else, send a no


    if msg =='exit game':

        print('Game Over')


  def play_again_clicked(self):


    reply = QtGui.QMessageBox.question(None,'Confirm Restart','Are you sure
you want to quit and restart?',QtGui.QMessageBox.Yes, QtGui.QMessageBox.No)


    if reply == QtGui.QMessageBox.Yes:

        self.clear_interface() #clears the interface because the play_again button
has been selected


    elif reply== QtGui.QMessageBox.No:

        pass
```

```
    def make_move(self,pos): #for making moves, using the thread it's called
everytime a button is clicked
        self.play_sound("clicked.wav") #plays the clicked sound


        if self.checking=="your move":


            self.grid2wid.show()
            self.sd.mousePressEvent= self.s_play
            self.sdo.mousePressEvent= self.o_play


        #if self.checking=="invalid move":
            #self.play_sound("invalid_move.wav")
            #print("Invalid Move")
            #print('\n')
            #self.show_msg("Invalidmove.png",1500)
            ##time.sleep(1)


        if self.checking[:9]=="opponents":
            self.show_msg('OpponentsMove',1000)
```

```
        self.pos=pos #setting self.pos to the position of the clicked space



    def o_play(self,event):
        self.char="O"
        self.grid2wid.close()
        self.mess_thread.message_sender(str(self.pos)+","+str(self.char).upper())


    def s_play(self,event):
        self.char="S"
        self.grid2wid.close()
        self.mess_thread.message_sender(str(self.pos)+","+str(self.char).upper())


    def shut_win(self):


        reply = QtGui.QMessageBox.question(None,'Confirm Exit...','Are you sure you
want exit?',QtGui.QMessageBox.Yes, QtGui.QMessageBox.No) #asking if the user
really wants to exit


        if reply == QtGui.QMessageBox.Yes: #if they click yes, close the window
            self.close()


        elif reply== QtGui.QMessageBox.No:
            pass
```

```
#you can only make a move if it's your move

def Clicked_zero0(self):

    print("zero")
    pos=0 #the position if this button was clicked

    self.make_move(pos)

    #self.show_msg()


def Clicked_zero1(self):

    pos=1
    self.make_move(pos)

def Clicked_zero2(self):

    pos=2
    self.make_move(pos)
```

```
def Clicked_zero3(self):

    pos=3
    self.make_move(pos)

#row2
def one0_Clicked(self):

    pos=4
    self.make_move(pos)

def one1_Clicked(self):
    pos=5
    self.make_move(pos)

def one2_Clicked(self):

    pos=6
    self.make_move(pos)

def one3_Clicked(self):

    pos=7
    self.make_move(pos)
```

```
#row3
def two0_Clicked(self):

    pos=8
    self.make_move(pos)

def two1_Clicked(self):

    pos=9
    self.make_move(pos)

def two2_Clicked(self):

    pos=10
    self.make_move(pos)

def two3_Clicked(self):

    pos=11
    self.make_move(pos)

#row4
def three0_Clicked(self):
```

```
        pos=12
        self.make_move(pos)

    def three1_Clicked(self):

        pos=13
        self.make_move(pos)

    def three2_Clicked(self):

        pos=14
        self.make_move(pos)

    def three3_Clicked(self):

        pos=15
        self.make_move(pos)


def main():

    main=Main()
    main.clear_interface() #so it could show
```

```
    #input('Press enter to exit.')


    main.show()
    sys.exit(app.exec_())


main()
```