Tic-Tac-Toe Documentation

Programming Concepts – Game Designing

Group 13

DIM-FOS

UOK

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Origination

The designed game is a straightforward game to play with another individual (dual player). Namely "Tic Tac Toe", is said to be originated from Ancient Egypt where such game boards have been found on roofing tiles dating from around 1300 BC. Even though it has evolved from those days, there are no huge improvements in the game and gameplay.

NOTE: This is a digitalized version of the "Tic Tac Toe" game.

Instructions to maneuver inside the game

1. The game is played on a 3x3 grid (total of 9 squares).
2. The game is programmed to let the first player use the symbol 'X' while the other player is prompted the symbol '0'.
3. In order to win the game, one has to get three identical marks (of that specific player) in the following ways:
    - Three identical marks vertically
    - Three identical marks horizontally
    - Three identical marks diagonally
4. If all the nine squares are filled without any formation of three identical marks of either 'X' or '0' in the required orders, the contest is considered to be drawn.

Encountered Problems and Challenges

- Initially, conceptualizing the design about how to develop the game using the C++ was tough.
- When a specific player enters a value (1-9) as the input and the same input is given by the opponent, the mark in the same place in the structure overwrites. (Without prompting an error)
- Assuming that in the 9^{th}(final) move of the game, the game always draws. (Wrong – Due to players being able to win in any move of the game)

- Another challenge was to make the code re-usable. As in, how to play the game again after the first game was entirely over.

Different approaches of the game

- Apply a timer for a players turn.
- Upgrade the interface (Preferably with C++ Builder) [Add labels, buttons, etc.]
- Deploy a single-user (Human vs Computer) choice to play the game.
- Add sound effects as players choose different options in the game.

Group Members

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Appendix

```
#include <iostream>
using namespace std;

struct p{
   char x;
} p[9]={'1','2','3','4','5','6','7','8','9'};
```

```
void draw();
int check();
int design();
int menu();
int instructions();
int multiplayer();
int credits();

int main(){
     menu();
}

void draw(){
   printf("  \n\n\n\n\t %c | %c | %c     \n"
        "  \t---|---|---\n"
        "  \t %c | %c | %c   \n"
        "  \t---|---|---\n"
        "                          \t          %c          |          %c          |          %c
\n",p[0].x,p[1].x,p[2].x,p[3].x,p[4].x,p[5].x,p[6].x,p[7].x,p[8].x,p[9].x);
}

// The play bord has designed here in draw function.

int check() {

     if ((p[0].x=='O' && p[1].x=='O' && p[2].x=='O') || (p[3].x=='O' && p[4].x=='O' &&
p[5].x=='O') ||
       (p[6].x=='O' && p[7].x=='O' && p[8].x=='O') || (p[0].x=='O' && p[3].x=='O' &&
p[6].x=='O') ||
```

```
    (p[1].x=='O' && p[4].x=='O' && p[7].x=='O') || (p[2].x=='O' && p[5].x=='O' &&
p[8].x=='O') ||
    (p[0].x=='O' && p[4].x=='O' && p[8].x=='O') || (p[2].x=='O' && p[4].x=='O' &&
p[6].x=='O'))

  {
        return 1;
  }

  else if ((p[0].x=='X' && p[1].x=='X' && p[2].x=='X') || (p[3].x=='X' && p[4].x=='X'
&& p[5].x=='X')||
        (p[6].x=='X' && p[7].x=='X' && p[8].x=='X') || (p[0].x=='X' &&
p[3].x=='X' && p[6].x=='X')||
        (p[1].x=='X' && p[4].x=='X' && p[7].x=='X') || (p[2].x=='X' &&
p[5].x=='X' && p[8].x=='X')||
        (p[0].x=='X' && p[4].x=='X' && p[8].x=='X') || (p[2].x=='X' &&
p[4].x=='X' && p[6].x=='X'))

        {
            return 2;
        }
  else if (p[0].x!='1' && p[1].x!='2' && p[2].x!='3' &&
        p[3].x!='4' && p[4].x!='5' && p[5].x!='6' &&
        p[6].x!='7' && p[7].x!='8' && p[8].x!='9')
        {
        return 0;
        }

}
//  The conditions to Check whether which player has won the game.
```

```
int design(){
    cout<<"\n\n
**********************************************************************************
*****"<< endl;
    cout<<"          ||||||  |||| |||||   ||||||  ||||||  ||||||  ||||||  ||||||"<<endl;
    cout<<"           ||    ||  ||      ||   ||  || ||      ||   ||  ||  ||   "<<endl;
    cout<<"           ||    ||  ||      ||   ||||||  ||      ||   ||  ||  ||||||"<<endl;
    cout<<"           ||    ||  ||      ||   ||  || ||      ||   ||  ||  ||   "<<endl;
    cout<<"           ||   ||||  |||||    ||   ||  ||  ||||||   ||   ||||||  ||||||"<<endl;
    cout<<"
**********************************************************************************
*****"<< endl;


    cout << "" << endl;
    cout << "" << endl;
    cout << "" << endl;
    cout << "                                Menu
    " << endl;
    cout << "" << endl;
    cout << "" << endl;


}

// Design of the game menu is here

int credits(){
    char m;
    system("cls");
    cout<<endl;
```

```
    cout<< "          |||| ||// |||||  ||||||  || ||||||  ||||||        "<<endl;
    cout<< "          ||   ||/  ||     ||  || ||   ||   ||           "<<endl;
    cout<< "          ||   ||   |||||  ||  || ||   ||   ||||||        "<<endl;
    cout<< "          ||   ||   ||     ||  || ||   ||      ||        "<<endl;
    cout<< "          |||| ||   |||||  ||||||  ||   ||   ||||||        "<<endl;


   cout<<endl<<endl;




    cout<<"       IM/2020/006-Sansala Nanayakkara"<<endl;
    cout<<"       IM/2020/035-Sadeesha Dilrangi"<<endl;
    cout<<"       IM/2020/040-Anushanga Kaluarachchi"<<endl;
    cout<<"       IM/2020/069-Navod Yasara"<<endl;
    cout<<"       IM/2020/115-Sonal Paranawithana"<<endl;
    cout<<"\n\n\nDo you want to go to the main menu?(y/n)\n";   // go back to menu
or exit
        cin>>m;
        if(m=='y'){
            system("cls");
            menu();
                    }else if(m=='n'){
                            exit(0);
                    }

}
```

```
int menu(){
    int i;
    struct p p2[9]={'1','2','3','4','5','6','7','8','9'};
    for(int i=0;i<9;i++){
     p[i]=p2[i];
    }

    design();
    cout<<"\t\t\t\t\t1. Start Game\n";
    cout<<"\t\t\t\t\t2. Instructions\n";
    cout<<"\t\t\t\t\t3. Credits"<<endl;
    cout<<"\t\t\t\t\t4. Quit Game\n"<<endl;
    cout<<"\n\nSubmit the number of the preferred option: ";
    cin>>i;
    if(i==1){
            multiplayer();
    }
    else if (i==2){
            instructions();
    }
    else if (i==3){
            credits();
    }
}

int multiplayer(){
   system("cls");
```

```
  string p1;
   string p2;

   cout<<"Enter name of the First Player: \n";
   cin>>p1;

   cout<<"Enter name of the Second Player: \n";
   cin>>p2;

   cout<<p1<< " is player 1, therefore "<<p1<< " will go first. \n";
   cout<<p2<< " is player 2, therefore "<<p2<< " will go second. \n\n";
  draw();
  int i,ps,ps1;

  for(i=0;i<=9;i++){

    if(check()==1)
    {
          char m;
      printf("\nCongratulations!!! \nPlayer 2 Wins the Game\n");

                cout<<"\nDo you want to go to the main menu?(y/n)\n";      //    go
back to menu or exit
      cin>>m;
      if(m=='y'){
          system("cls");
          menu();
                }else if(m=='n'){
                      exit(0);
```

```
                }
    break;
}

    if(check()==2)
{
    char m;
    printf("\nCongratulations!!!\nPlayer 1 Wins the Game\nPlay again\n");

      cout<<"\nYou want to go to the main menu?(y/n)\n";        //  go back to menu or exit
    cin>>m;
    if(m=='y'){
    system("cls");
    menu();
            }else if(m=='n'){
                exit(0);
            }
    break;
}


    if(i%2==0){
            printf("\n\nMake Player 1's turn: ");
  scanf("%d",&ps);
  system("cls");


            if(p[ps-1].x!='1' && p[ps-1].x!='2' && p[ps-1].x!='3' &&
```

```
        p[ps-1].x!='4' && p[ps-1].x!='5' && p[ps-1].x!='6' &&          //array index
= TTT Board Number-1(ps-1 in this case)
        p[ps-1].x!='7' && p[ps-1].x!='8' && p[ps-1].x!='9')
        {
          printf("\n\nInvalid position\n Invalid Input ! \nPlay again\n");
          break;
        }

      p[ps-1].x='X';
      draw();

            if(check()==0) {

                  char m;
                  printf("\n\nThe Game has Drawn !\n");

                    cout<<"\nYou want to go to the main menu?(y/n)";
  // go back to menu or exit
        cin>>m;

                  if(m=='y'){
        system("cls");
        menu();
                  }
                  else if(m=='n'){
                  multiplayer();
                  }
                  break;
                  }
```

```
    }

        if(i%2==1){
                    printf("\n\nMake Player 2's turn: ");
            scanf("%d",&ps1);
            system("cls");


              if(p[ps1-1].x!='1' && p[ps1-1].x!='2' && p[ps1-1].x!='3' &&
        p[ps1-1].x!='4' && p[ps1-1].x!='5' && p[ps1-1].x!='6' &&          //array index
= TTT Board Number-1(ps-1 in this case)
        p[ps1-1].x!='7' && p[ps1-1].x!='8' && p[ps1-1].x!='9')

                    {
            printf("\n\nInvalid position\nInvalid Input!\nPlay again\n");
            break;
            }
            p[ps1-1].x='O';
            draw();

              if(check()==0){

                    char m;
                    printf("\nThe Game has Drawn !\n");

                      cout<<"\nYou want to go to the main menu?(y/n)";
    // go back to menu or exit
        cin>>m;
```

```
            if(m=='y'){

                        system("cls");
            menu();
                        }

                        else if(m=='n'){
                        multiplayer();
                        }
                        break;

                    }
        }
    }

}

int instructions(){
     char m;
     system("cls");

     cout<< "              || ||/||||| ||||||  ||  ||// ||  ||  ||||  ||  ||  ||||  ||/||||| ||||||
"<<endl;
   cout<< "          || ||/  || ||    |||| ||/  ||  || ||   |||| || ||  || ||/  || ||      "<<endl;
   cout<< "          || ||   || ||||||  ||  ||  ||  || ||    ||  || ||  || ||   || ||||||    "<<endl;
   cout<< "          || ||   ||    ||  ||  ||  ||  || ||    ||  || ||  || ||   ||    ||   "<<endl;
   cout<< "          || ||   || ||||||  || ||   ||||  ||||  || ||  |||| ||   || ||||||     "<<endl;
   cout << "" << endl;
     cout << "1.The game is played on a 3x3 grid (total of 9 squares)\n" << endl;
```

```
    cout << "2.The game is programmed to let the first player use the symbol X while the other player is prompted the symbol O\n" << endl;

    cout <<         "3.In order to win the game, one has to get three identical marks (of that specific player) in the following ways: \n";

    cout << "* Three identical marks vertically" << endl;

    cout << "* Three identical marks horizontally" << endl;

    cout << "* Three identical marks diagonally\n" << endl;

    cout << "4.If all the nine squares are filled without any formation of three identical marks of either X or O in the required orders, the contest is considered to be drawn.\n\n";


    //  Display how to play the game.


    cout<<"\n\n\nDo you want to go to the main menu?(y/n)";              // go back to menu or exit

    cin>>m;

        if(m=='y'){

            system("cls");

            menu();

                    }else if(m=='n'){

                            exit(0);

                    }


}
```

END OF CODE