Thief and Police chase down Game

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Short Description

This is a game with a thief and Policemen. Police has to chase the thief.

Game Characters

There is one thief which is acting as a player. There are 3 Policemen which have to caught the thief and one of them has a function to kill thief. When thief is close to this policeman, the policeman starts to fire. Remaining, one is appearing randomly from maze from left side and other is from right side. Thief has specific time to save itself from these Police officers.

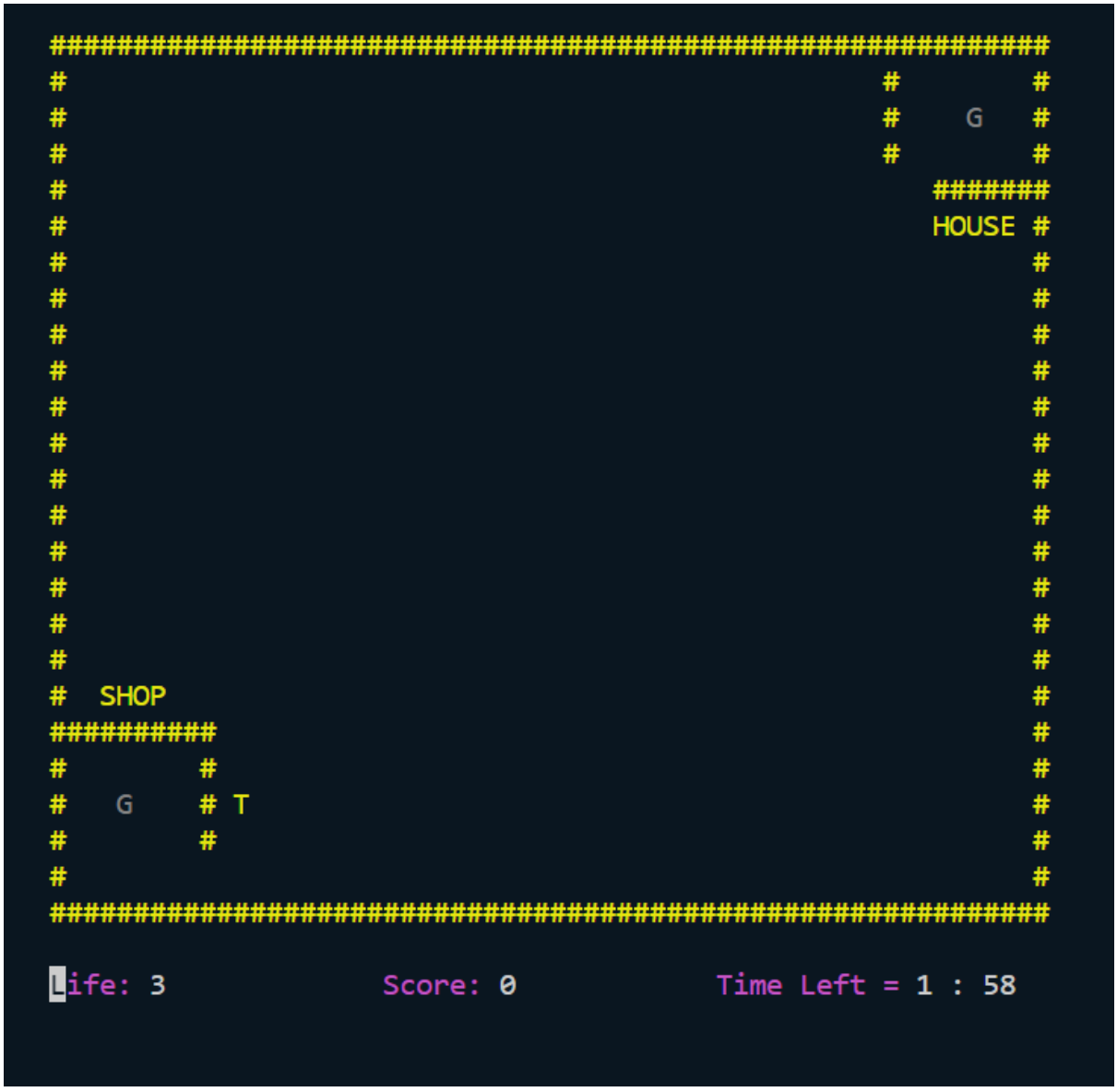
Rules & Interactions

- Thief is control by right, left, up and down keys.
- On the sides there are Obstacles.
- If fire by specific policeman is hit to the thief, life will decrease.
- If game is complete in specific time than specific score is allocated to the player.
- There is specific time to complete game otherwise game will win by the thief.
- Players can play game 3 times.

Goal of the Game

Goal of the game is to save and complete game as early as possible and get high scores.

Main Screen



Functions Prototypes

```
/************************* Function Prototypes *************************/

void gotoxy(int x, int y);
HANDLE hConsole = GetStdHandle(STD_OUTPUT_HANDLE); // Colour Function

// HANDLE out = GetStdHandle(STD_OUTPUT_HANDLE);...

/************ Load and print maze from file ************/
void load(char maze[][61], int rowSize, int colSize, string path);
void printMaze(char maze[][61], int colSize, int rowSize);

/************ Movement ************/
void moveLeft(char maze[][61], int &xIdx, int &yIdx);
void moveRight(char maze[][61], int &xIdx, int &yIdx);
void moveUp(char maze[][61], int &xIdx, int &yIdx);
void moveDown(char maze[][61], int &xIdx, int &yIdx);
int random();
void gamePlay(bool gameRunning, int &life, char maze[][61], int rowSize, int colSize, int &xIdx, int &yIdx, int &police1X, int &
police1Y, int &police2X, int &police2Y, int &police3X, int &police3Y);

void bulletMovement(char maze[][61], int rowSize, int colSize, int &score);
void police2Bullet(char maze[][61], int rowSize, int colSize, int &life);
void police1Bullet(char maze[][61], int rowSize, int colSize, int &life);
void police3Bullet(char maze[][61], int rowSize, int colSize, int &life);
bool checking(char maze[][61], int xIdx, int yIdx);
```

```
void movePolice1_down(char maze[][61], int &police1X, int &police1Y);
void movePolice1_up(char maze[][61], int &police1X, int &police1Y);
void movePolice1_right(char maze[][61], int &police1X, int &police1Y);
void movePolice1_left(char maze[][61], int &police1X, int &police1Y);
void movePolice2_left(char maze[][61], int &police2X, int &police2Y);
void movePolice2_right(char maze[][61], int &police2X, int &police2Y);
void movePolice2_down(char maze[][61], int &police2X, int &police2Y);
void movePolice2_up(char maze[][61], int &police2X, int &police2Y);
void movePolice3_right(char maze[][61], int &police3X, int &police3Y);
void movePolice3_left(char maze[][61], int &police3X, int &police3Y);
void movePolice3_up(char maze[][61], int &police3X, int &police3Y);
void movePolice3_down(char maze[][61], int &police3X, int &police3Y);
```

Complete Code

```
#include <iostream>  // input output
#include <windows.h> // gotoxy,colour
#include <fstream>   // File Handling
#include <ctime>     // Srand function
#include <conio.h>   // system ClS , getch
using namespace std;

/********** Function Prototypes **********/

void gotoxy(int x, int y);
HANDLE hConsole = GetStdHandle(STD_OUTPUT_HANDLE); // Colour
Function

// HANDLE out = GetStdHandle(STD_OUTPUT_HANDLE);
// CONSOLE_CURSOR_INFO cursorInfo;
```

```
// GetConsoleCursorInfo(out, &cursorInfo);
// cursorInfo.bVisible = false; // set the cursor visibility
// SetConsoleCursorInfo(out, &cursorInfo);

/***** Load and print maze from file *****/
void load(char maze[][61], int rowSize, int colSize, string path);
void printMaze(char maze[][61], int colSize, int rowSize);

/***** Movement *****/
void moveLeft(char maze[][61], int &xIdx, int &yIdx);
void moveRight(char maze[][61], int &xIdx, int &yIdx);
void moveUp(char maze[][61], int &xIdx, int &yIdx);
void moveDown(char maze[][61], int &xIdx, int &yIdx);
int random();
void gamePlay(bool gameRunning, int &life, char maze[][61], int rowSize, int
colSize, int &xIdx, int &yIdx, int &police1X, int &police1Y, int &police2X, int
&police2Y, int &police3X, int &police3Y);

void bulletMovement(char maze[][61], int rowSize, int colSize, int &score);
void police2Bullet(char maze[][61], int rowSize, int colSize, int &life);
void police1Bullet(char maze[][61], int rowSize, int colSize, int &life);
void police3Bullet(char maze[][61], int rowSize, int colSize, int &life);
bool checking(char maze[][61], int xIdx, int yIdx);

void movePolice1_down(char maze[][61], int &police1X, int &police1Y);
void movePolice1_up(char maze[][61], int &police1X, int &police1Y);
void movePolice1_right(char maze[][61], int &police1X, int &police1Y);
void movePolice1_left(char maze[][61], int &police1X, int &police1Y);
void movePolice2_left(char maze[][61], int &police2X, int &police2Y);
void movePolice2_right(char maze[][61], int &police2X, int &police2Y);
void movePolice2_down(char maze[][61], int &police2X, int &police2Y);
void movePolice2_up(char maze[][61], int &police2X, int &police2Y);
void movePolice3_right(char maze[][61], int &police3X, int &police3Y);
void movePolice3_left(char maze[][61], int &police3X, int &police3Y);
void movePolice3_up(char maze[][61], int &police3X, int &police3Y);
void movePolice3_down(char maze[][61], int &police3X, int &police3Y);

int score = 0;
bool Eat = false;
```

```
int thing1X = 21;
int thing1Y = 4;

int thing2X = 2;
int thing2Y = 55;

/********** Main Function **********/
main()
{
  char maze[25][61]; // 2d array for maze
  string path = "maze.txt";

  int rowSize = sizeof(maze) / sizeof(maze[0]);
  int colSize = sizeof(maze[0]) / sizeof(maze[0][0]);

  load(maze, rowSize, colSize, path);

  int xIdx = 21; // Printing Player at specific position
  int yIdx = 11;
  maze[xIdx][yIdx] = 'T';

  int police1X = 2; // Printing Police at specific position
  int police1Y = 49;

  int police2X = 14; // Printing Police at specific position
  int police2Y = 1;

  int police3X = 12; // Printing Police at specific position
  int police3Y = 58;

  system("CLS");

  SetConsoleTextAttribute(hConsole, 6); // Yellow
  printMaze(maze, colSize, rowSize);    // End of Load and Printing objects and
maze
  SetConsoleTextAttribute(hConsole, 7); // Whtie

  maze[thing1X][thing1Y] = 'G';
  SetConsoleTextAttribute(hConsole, 8); // Gray
  gotoxy(thing1Y, thing1X);
```

```
  cout << "G";

  maze[thing2X][thing2Y] = 'G';
  SetConsoleTextAttribute(hConsole, 8); // Gray
  gotoxy(thing2Y, thing2X);
  cout << "G";

  int life = 3;

  gamePlay(1, life, maze, rowSize, colSize, xIdx, yIdx, police1X, police1Y,
police2X, police2Y, police3X, police3Y);

  if (life == 0)
  {
    SetConsoleTextAttribute(hConsole, 5); // Purple
    gotoxy(0, 26);
    cout << "Life: ";
    SetConsoleTextAttribute(hConsole, 7); // Whtie
    cout << "0";

    SetConsoleTextAttribute(hConsole, 2); // Green
    gotoxy(70, 13);
    cout << "YOU LOSE!!!";
    getch();
    SetConsoleTextAttribute(hConsole, 7); // Whtie
  }
}

// Functions Defination
void gotoxy(int x, int y)
{
  COORD coordinates;
  coordinates.X = x;
  coordinates.Y = y;
  SetConsoleCursorPosition(GetStdHandle(STD_OUTPUT_HANDLE),
coordinates);
}

/***** Load and print maze from file *****/
void load(char maze[][61], int rowSize, int colSize, string path)
```

```
{
  fstream myFile;
  string record;
  myFile.open(path, ios::in);
  for (int row = 0; row < rowSize; row++)
  {
    getline(myFile, record);
    for (int col = 0; col < colSize; col++)
    {
      maze[row][col] = record[col];
    }
  }
}

void printMaze(char maze[][61], int colSize, int rowSize)
{
  for (int x = 0; x < rowSize; x++)
  {
    for (int y = 0; y < colSize; y++)
    {
      cout << maze[x][y];
    }
    cout << endl;
  }
}

/***** Movement *****/
void moveLeft(char maze[][61], int &xIdx, int &yIdx)
{
  if (maze[xIdx][yIdx - 1] == ' ' || maze[xIdx][yIdx - 1] == 'G') // checking and
Printing space
  {
    maze[xIdx][yIdx] = ' ';
    gotoxy(yIdx, xIdx);
    cout << " ";

    yIdx--;

    SetConsoleTextAttribute(hConsole, 1); // Blue
    maze[xIdx][yIdx] = 'T';              // Printing object
```

```
    gotoxy(yIdx, xIdx);
    cout << 'T';
  }
}

void moveRight(char maze[][61], int &xIdx, int &yIdx)
{
  if (maze[xIdx][yIdx + 1] == ' ' || maze[xIdx][yIdx + 1] == 'G') // checking and
Printing space
  {
    maze[xIdx][yIdx] = ' ';
    gotoxy(yIdx, xIdx);
    cout << " ";

    yIdx++;

    SetConsoleTextAttribute(hConsole, 1); // Blue
    maze[xIdx][yIdx] = 'T';              // Printing object
    gotoxy(yIdx, xIdx);
    cout << 'T';
  }
}

void moveUp(char maze[][61], int &xIdx, int &yIdx)
{
  if (maze[xIdx - 1][yIdx] == ' ' || maze[xIdx - 1][yIdx] == 'G') // checking and
Printing space
  {
    maze[xIdx][yIdx] = ' ';
    gotoxy(yIdx, xIdx);
    cout << " ";

    xIdx--;

    SetConsoleTextAttribute(hConsole, 1); // Blue
    maze[xIdx][yIdx] = 'T';              // Printing object
    gotoxy(yIdx, xIdx);
    cout << 'T';
  }
}
```

```
void moveDown(char maze[][61], int &xIdx, int &yIdx)
{
  if (maze[xIdx + 1][yIdx] == ' ' || maze[xIdx + 1][yIdx] == 'G') // checking and
Printing space
  {
    maze[xIdx][yIdx] = ' ';
    gotoxy(yIdx, xIdx);
    cout << " ";

    xIdx++;

    SetConsoleTextAttribute(hConsole, 1); // Blue
    maze[xIdx][yIdx] = 'T';              // Printing object
    gotoxy(yIdx, xIdx);
    cout << 'T';
  }
}

int random()
{
  srand(time(0));
  int result = rand() % 4;
  return result;
}

void gamePlay(bool gameRunning, int &life, char maze[][61], int rowSize, int
colSize, int &xIdx, int &yIdx, int &police1X, int &police1Y, int &police2X, int
&police2Y, int &police3X, int &police3Y)
{
  int seconds = 120;
  int counter = 0;
  int position;
  time_t end = time(NULL) + 120;
  while (time(NULL) <= end && gameRunning == true && life > 0 && (Eat !=
true || maze[thing1X][thing1Y] == 'G'))
  {
    Sleep(170);

    Eat = checking(maze, xIdx, yIdx);
```

```
if (Eat == true && maze[thing1X][thing1Y] != 'G' && life > 0)
{
  SetConsoleTextAttribute(hConsole, 2); // Green
  gotoxy(70, 13);
  cout << "YOU WIN!!!";
  getch();
}

SetConsoleTextAttribute(hConsole, 5); // Purple
gotoxy(0, 26);
cout << "Life: ";

SetConsoleTextAttribute(hConsole, 7); // Whtie
cout << life;

SetConsoleTextAttribute(hConsole, 5); // Purple
gotoxy(20, 26);
cout << "Score: ";
SetConsoleTextAttribute(hConsole, 7); // Whtie
cout << score;

int minutes = seconds / 60;
int sec = seconds % 60;
SetConsoleTextAttribute(hConsole, 5); // Purple
gotoxy(40, 26);
cout << "Time Left = ";

SetConsoleTextAttribute(hConsole, 7); // Whtie
gotoxy(40, 39);
cout << minutes << " : " << sec;

position = random();

if (maze[thing1X][thing1Y] != 'G')
{
  if (position == 0)
  {
    movePolice1_left(maze, police1X, police1Y);
    movePolice2_right(maze, police2X, police2Y);
```

```
      movePolice3_down(maze, police3X, police3Y);
     }

     if (position == 1)
     {
      movePolice1_right(maze, police1X, police1Y);
      movePolice2_left(maze, police2X, police2Y);
      movePolice3_up(maze, police3X, police3Y);
     }

     if (position == 2)
     {
      movePolice1_up(maze, police1X, police1Y);
      movePolice2_down(maze, police2X, police2Y);
      movePolice3_left(maze, police3X, police3Y);
     }

     if (position == 3)
     {
      movePolice1_down(maze, police1X, police1Y);
      movePolice2_up(maze, police2X, police2Y);
      movePolice3_right(maze, police3X, police3Y);
     }

     police1Bullet(maze, rowSize, colSize, life);
     police2Bullet(maze, rowSize, colSize, life);
     police3Bullet(maze, rowSize, colSize, life);
    }

    if (GetAsyncKeyState(VK_LEFT))
    {
     moveLeft(maze, xIdx, yIdx);
    }

    if (GetAsyncKeyState(VK_RIGHT))
    {
     moveRight(maze, xIdx, yIdx);
    }

    if (GetAsyncKeyState(VK_UP))
```

```
    {
      moveUp(maze, xIdx, yIdx);
    }

    if (GetAsyncKeyState(VK_DOWN))
    {
      moveDown(maze, xIdx, yIdx);
    }

    if (GetAsyncKeyState(VK_ESCAPE))
    {
      gameRunning = false; // Stop the game
    }

    if (GetAsyncKeyState(VK_SPACE))
    {
      if (maze[xIdx - 1][yIdx] == ' ' || maze[xIdx - 1][yIdx] == 'P')
      {
        int TIdx = xIdx;
        TIdx--;
        maze[TIdx][yIdx] = '.';
        SetConsoleTextAttribute(hConsole, 3); // Aqua
        gotoxy(yIdx, TIdx);
        cout << ".";
      }
    }

    bulletMovement(maze, rowSize, colSize, score);
    if (counter >= 5 && seconds > 0)
    {
      seconds--;
      counter = 0;
    }
    counter++;
  }
}

void bulletMovement(char maze[][61], int rowSize, int colSize, int &score)
{
  for (int row = 0; row < rowSize; row++)
```

```
  {
    for (int col = 0; col < colSize; col++)
    {
      if (maze[row][col] == '.' && (maze[row - 1][col] == ' ' || maze[row - 1][col]
== 'P'))
      {
        if (maze[row - 1][col] == 'P')
        {
          score++;
        }

        maze[row][col] = ' ';
        gotoxy(col, row);
        cout << " ";

        maze[row - 1][col] = '.';
        SetConsoleTextAttribute(hConsole, 3); // Aqua
        gotoxy(col, row - 1);
        cout << ".";
      }

      else if (maze[row][col] == '.' && (maze[row - 1][col] != ' ' && maze[row -
1][col] != 'P'))
      {
        maze[row][col] = ' ';
        gotoxy(col, row);
        cout << " ";
      }
    }
  }
}

void police1Bullet(char maze[][61], int rowSize, int colSize, int &life)
{
  for (int row = 0; row < rowSize; row++)
  {
    for (int col = 0; col < colSize; col++)
    {
      if (maze[row][col] == '*' && (maze[row + 1][col] == ' ' || maze[row +
1][col] == 'T'))
```

```
      {
       if (maze[row + 1][col] == 'T')
       {
         life--;
       }
       maze[row][col] = ' ';
       gotoxy(col, row);
       cout << " ";

       maze[row + 1][col] = '*';
       SetConsoleTextAttribute(hConsole, 7); // white
       gotoxy(col, row + 1);
       cout << '*';
      }

     else if (maze[row][col] == '*' && (maze[row + 1][col] != ' ' && maze[row
+ 1][col] != 'T' && maze[row][col + 1] != 'P'))
      {
       maze[row][col] = ' ';
       gotoxy(col, row);
       cout << " ";
      }
    }
  }
}

void police2Bullet(char maze[][61], int rowSize, int colSize, int &life)
{
  for (int row = 0; row < rowSize; row++)
  {
    for (int col = 0; col < colSize; col++)
    {
     if (maze[row][col] == ',' && (maze[row][col - 1] == ' ' || maze[row][col - 1]
== 'T'))
      {
       if (maze[row][col - 1] == 'T')
       {
         life--;
       }
       maze[row][col] = ' ';
```

```
        gotoxy(col, row);
        cout << " ";

        maze[row][col - 1] = ',';
        SetConsoleTextAttribute(hConsole, 7); // white
        gotoxy(col - 1, row);
        cout << ",";
       }

      else if (maze[row][col] == ',' && (maze[row][col - 1] != ' ' &&
maze[row][col - 1] != 'T' && maze[row][col + 1] != 'P'))
      {
        maze[row][col] = ' ';
        gotoxy(col, row);
        cout << " ";
      }
    }
  }
}

void police3Bullet(char maze[][61], int rowSize, int colSize, int &life)
{
  for (int row = 0; row < rowSize; row++)
  {
    for (int col = 0; col < colSize; col++)
    {
      if (maze[row][col] == '@' && (maze[row][col + 1] == ' ' || maze[row][col +
1] == 'T')) // Right
      {
        if (maze[row][col + 1] == 'T')
        {
          life--;
        }
        maze[row][col] = ' ';
        gotoxy(col, row);
        cout << " ";

        maze[row][col + 1] = '@';
        SetConsoleTextAttribute(hConsole, 7); // white
        gotoxy(col + 1, row);
```

```
      cout << "@";
     }

    else if (maze[row][col] == '@' && (maze[row][col + 1] != ' ' &&
maze[row][col + 1] != 'T'))
     {
      maze[row][col] = ' ';
      gotoxy(col, row);
      cout << " ";
     }
   }
  }
}

bool checking(char maze[][61], int xIdx, int yIdx)
{
  if (maze[xIdx][yIdx] == maze[thing2X][thing2Y])
  {
   return true;
  }
  else
  {
   return false;
  }
}

void movePolice1_up(char maze[][61], int &police1X, int &police1Y)
{
  if (maze[police1X - 1][police1Y] == ' ') // checking and Printing space
  {
   maze[police1X][police1Y] = ' ';
   gotoxy(police1Y, police1X);
   cout << " ";

   police1X--;

   maze[police1X][police1Y] = 'P';       // Printing object
   SetConsoleTextAttribute(hConsole, 4); // Red
   gotoxy(police1Y, police1X);
   cout << 'P';
```

```
  }

  if (maze[police1X - 1][police1Y] == ' ' || maze[police1X - 1][police1Y] == 'T')
  {
    int AIdx = police1X;
    AIdx--;
    maze[AIdx][police1Y] = '*';
    SetConsoleTextAttribute(hConsole, 7); // white
    gotoxy(police1Y, AIdx);
    cout << "*";
  }
}

void movePolice1_down(char maze[][61], int &police1X, int &police1Y)
{
  if (maze[police1X + 1][police1Y] == ' ') // checking and Printing space
  {
    maze[police1X][police1Y] = ' ';
    gotoxy(police1Y, police1X);
    cout << " ";

    police1X++;

    maze[police1X][police1Y] = 'P';       // Printing object
    SetConsoleTextAttribute(hConsole, 4); // Red
    gotoxy(police1Y, police1X);
    cout << 'P';
  }

  if (maze[police1X + 1][police1Y] == ' ' || maze[police1X + 1][police1Y] ==
'T')
  {
    int AIdx = police1X;
    AIdx++;
    maze[police1X][police1Y] = '*';
    SetConsoleTextAttribute(hConsole, 7); // white
    gotoxy(police1Y, police1X);
    cout << "*";
  }
}
```

```
void movePolice1_right(char maze[][61], int &police1X, int &police1Y)
{
  if (maze[police1X][police1Y + 1] == ' ') // checking and Printing space
  {
    maze[police1X][police1Y] = ' ';
    gotoxy(police1Y, police1X);
    cout << " ";

    police1Y++;

    maze[police1X][police1Y] = 'P';       // Printing object
    SetConsoleTextAttribute(hConsole, 4); // Red
    gotoxy(police1Y, police1X);
    cout << 'P';
  }

  if (maze[police1X][police1Y + 1] == ' ' || maze[police1X][police1Y + 1] ==
'T')
  {
    int AIdx = police1Y;
    AIdx++;
    maze[police1X][AIdx] = '*';
    SetConsoleTextAttribute(hConsole, 7); // white
    gotoxy(AIdx, police1X);
    cout << "*";
  }
}

void movePolice1_left(char maze[][61], int &police1X, int &police1Y)
{
  if (maze[police1X][police1Y - 1] == ' ' || maze[police1X][police1Y - 1] == ',' ||
maze[police1X][police1Y - 1] == '@', maze[police1X][police1Y - 1] == '*') //
checking and Printing space
  {
    maze[police1X][police1Y] = ' ';
    gotoxy(police1Y, police1X);
    cout << " ";

    police1Y--;
```

```
    maze[police1X][police1Y] = 'P';       // Printing object
    SetConsoleTextAttribute(hConsole, 4); // Red
    gotoxy(police1Y, police1X);
    cout << 'P';
   }

   if (maze[police1X][police1Y - 1] == ' ' || maze[police1X][police1Y - 1] == 'T')
   {
    int AIdx = police1Y;
    AIdx--;
    maze[police1X][AIdx] = '*';
    SetConsoleTextAttribute(hConsole, 7); // white
    gotoxy(AIdx, police1X);
    cout << "*";
   }
}

void movePolice2_up(char maze[][61], int &police2X, int &police2Y)
{
   if (maze[police2X - 1][police2Y] == ' ') // checking and Printing space
   {
    maze[police2X][police2Y] = ' ';
    gotoxy(police2Y, police2X);
    cout << " ";

    police2X--;

    maze[police2X][police2Y] = 'P';       // Printing object
    SetConsoleTextAttribute(hConsole, 4); // Red
    gotoxy(police2Y, police2X);
    cout << 'P';
   }

   if (maze[police2X - 1][police2Y] == ' ' || maze[police2X - 1][police2Y] == 'T')
   {
    int BIdx = police2X;
    BIdx--;
    maze[BIdx][police2Y] = ',';
    SetConsoleTextAttribute(hConsole, 7); // white
```

```
    gotoxy(police2Y, BIdx);
    cout << ",";
  }
}

void movePolice2_down(char maze[][61], int &police2X, int &police2Y)
{
  if (maze[police2X + 1][police2Y] == ' ') // checking and Printing space
  {
    maze[police2X][police2Y] = ' ';
    gotoxy(police2Y, police2X);
    cout << " ";

    police2X++;

    maze[police2X][police2Y] = 'P';       // Printing object
    SetConsoleTextAttribute(hConsole, 4); // Red
    gotoxy(police2Y, police2X);
    cout << 'P';
  }

  if (maze[police2X + 1][police2Y] == ' ' || maze[police2X + 1][police2Y] ==
'T')
  {
    int BIdx = police2X;
    BIdx++;
    maze[BIdx][police2Y] = ',';
    SetConsoleTextAttribute(hConsole, 7); // white
    gotoxy(police2Y, BIdx);
    cout << ",";
  }
}

void movePolice2_right(char maze[][61], int &police2X, int &police2Y)
{
  if (maze[police2X][police2Y + 1] == ' ') // checking and Printing space
  {
    maze[police2X][police2Y] = ' ';
    gotoxy(police2Y, police2X);
    cout << " ";
```

```
    police2Y++;

    maze[police2X][police2Y] = 'P';       // Printing object
    SetConsoleTextAttribute(hConsole, 4); // Red
    gotoxy(police2Y, police2X);
    cout << 'P';
   }

  if (maze[police2X][police2Y + 1] == ' ' || maze[police2X][police2Y + 1] ==
'T')
  {
    int BIdx = police2Y;
    BIdx++;
    maze[police2X][BIdx] = ',';
    SetConsoleTextAttribute(hConsole, 7); // white
    gotoxy(BIdx, police2X);
    cout << ",";
  }
}

void movePolice2_left(char maze[][61], int &police2X, int &police2Y)
{
  if (maze[police2X][police2Y - 1] == ' ') // checking and Printing space
  {
    maze[police2X][police2Y] = ' ';
    gotoxy(police2Y, police2X);
    cout << " ";

    police2Y--;

    maze[police2X][police2Y] = 'P';       // Printing object
    SetConsoleTextAttribute(hConsole, 4); // Red
    gotoxy(police2Y, police2X);
    cout << 'P';
  }

  if (maze[police2X][police2Y - 1] == ' ' || maze[police2X][police2Y - 1] == 'T')
  {
    int BIdx = police2Y;
```

```
    BIdx--;
    maze[police2X][BIdx] = ',';
    SetConsoleTextAttribute(hConsole, 7); // white
    gotoxy(BIdx, police2X);
    cout << ",";
  }
}

void movePolice3_up(char maze[][61], int &police3X, int &police3Y)
{
  if (maze[police3X - 1][police3Y] == ' ') // checking and Printing space
  {
    maze[police3X][police3Y] = ' ';
    gotoxy(police3Y, police3X);
    cout << " ";

    police3X--;

    maze[police3X][police3Y] = 'P';       // Printing object
    SetConsoleTextAttribute(hConsole, 4); // Red
    gotoxy(police3Y, police3X);
    cout << 'P';
  }

  if (maze[police3X - 1][police3Y] == ' ' || maze[police3X - 1][police3Y == 'T'])
  {
    int AIdx = police3X;
    AIdx--;
    maze[AIdx][police3Y] = '@';
    SetConsoleTextAttribute(hConsole, 7); // white
    gotoxy(police3Y, AIdx);
    cout << "@";
  }
}

void movePolice3_down(char maze[][61], int &police3X, int &police3Y)
{
  if (maze[police3X + 1][police3Y] == ' ') // checking and Printing space
  {
    maze[police3X][police3Y] = ' ';
```

```
    gotoxy(police3Y, police3X);
    cout << " ";

    police3X++;

    maze[police3X][police3Y] = 'P';       // Printing object
    SetConsoleTextAttribute(hConsole, 4); // Red
    gotoxy(police3Y, police3X);
    cout << 'P';
   }

  if (maze[police3X + 1][police3Y] == ' ' || maze[police3X + 1][police3Y ==
'T'])
   {
    int AIdx = police3X;
    AIdx++;
    maze[AIdx][police3Y] = '@';
    SetConsoleTextAttribute(hConsole, 7); // white
    gotoxy(police3Y, AIdx);
    cout << "@";
   }
}

void movePolice3_right(char maze[][61], int &police3X, int &police3Y)
{
  if (maze[police3X][police3Y + 1] == ' ') // checking and Printing space
   {
    maze[police3X][police3Y] = ' ';
    gotoxy(police3Y, police3X);
    cout << " ";

    police3Y++;

    maze[police3X][police3Y] = 'P';       // Printing object
    SetConsoleTextAttribute(hConsole, 4); // Red
    gotoxy(police3Y, police3X);
    cout << 'P';
   }
```

```
  if (maze[police3X][police3Y + 1] == ' ' || maze[police3X][police3Y + 1] ==
'T')
  {
    int AIdx = police3Y;
    AIdx++;
    maze[police3X][AIdx] = '@';
    SetConsoleTextAttribute(hConsole, 7); // white
    gotoxy(AIdx, police3X);
    cout << "@";
  }
}

void movePolice3_left(char maze[][61], int &police3X, int &police3Y)
{
  if (maze[police3X][police3Y - 1] == ' ') // checking and Printing space
  {
    maze[police3X][police3Y] = ' ';
    gotoxy(police3Y, police3X);
    cout << " ";

    police3Y--;

    maze[police3X][police3Y] = 'P';       // Printing object
    SetConsoleTextAttribute(hConsole, 4); // Red
    gotoxy(police3Y, police3X);
    cout << 'P';
  }

  if (maze[police3X][police3Y - 1] == ' ' || maze[police3X][police3Y - 1] == 'T')
  {
    int AIdx = police3Y;
    AIdx--;
    maze[police3X][AIdx] = '@';
    SetConsoleTextAttribute(hConsole, 7); // white
    gotoxy(AIdx, police3X);
    cout << "@";
  }
}
```

Student Reg. No: 2021-CS-144 **Student Name.** Muhammad Umair Shahid

	A-Extensive Evidence	**B-Convincing Evidence**	**C-Limited Evidence**	**D-No Evidence**
Documentation Formatting **Grade:**	All the documentation meets all the criteria.	Documentation is well formatted but some of the criteria is not fulfilled.	Documentation is required a lot of improvement.	Documentation is not Available
Documentation Formatting Criteria: In **Binder**, **Title** Page, **Header**-Footers, Font **Style**, Font **Size** all are all consistence and according to given **guidelines**. Project **Poster** is professionally design and well presented				
Documentation Contents **Grade:**	Documentation includes all of the criteria.	Documentation meet more than 80% of the criteria given.	Documentation meet more than 50% of the criteria.	When the documentation meet less than 50% of the criteria.
Documentation Contents Criteria: Title Page - **Table** of Contents - Project **Abstract** - **Functional** Requirements - **Wire** Frames –**Data Flow** Diagram-**Data** Structure (Arrays)-**Function** Headers and Description - **Algorithms** and Flow Charts of all functions- **Test Cases** are defined Project **Code.** - **Weakness** in the Project and **Future** Directions. - **Conclusion** and What your **Learn** from the Project and Course and What is your **Future** Planning.				
Project Complexity **Grade:**	Project has at least 2 user's types and each user has at least 5 functionalities.	Project complexity meet 80% criteria given in extensive evidence	Project complexity meet 50% criteria given in extensive evidence	Project complexity meet less than 50% criteria given in extensive evidence
Code Style **Grade:**	All Code style criteria is followed	All code style criteria followed but some improvements required	lot of improvements required in coding style.	**Did not follow** code style,
Code Style Criteria: Consistent code style. Code is well indented. Variable and Function names are well defined. White Spaces are well used. Comments are added.				
Code Documentation Mapping **Grade:**	Code and documentation is synchronized.	Code and documentation does not synchronized at **some** places	Code and documentation does not synchronized at **many** places	Code and documentation **does not** synchronized.
Data Structure (Arrays) **Grade:**	Data structure is sufficient for the project requirements	Data Structure is sufficient but require improvement to meet project requirements.	Data structure is not sufficient and need a lot of improvement	Data Structure is not properly identified and declared.
Sorting Features **Grade:**	Sort working 100% and generating useful report	Sorting Feature is working but sorted data is not useful for project.	Sorting feature is partial implemented	Project do not contain sorting
Modularity **Grade:**	Meet all Modularity criteria	Meet all Modularity criteria but at some places it is missing	Do not sufficiently meet the modularity criteria.	No modularity or very minimum modularity.
Modularity criteria: Functions are defined for each major feature. Functions are independent (identify from parameter list and return types)- Demo Data Functionality Added-At least Two Unit Tests are defined.				
Validations **Grade:**	Validations on all number type inputs are applied	Validations are applied but at some places it is missing.	Validations are missing at lot of places	No Validations are used
Recommendation Feature	Proper meaning full recommendation is present into system	Partial Recommendation is implemented	Implemented but not meaning full.	Not implemented
Presentation and Demo **Grade:**	Presentation and Demo was 100% working	Presentation and Demo require some improvements	Presentation and Demo require a lot of improvements	Presentation was not ok and Demo was not working
Student Understanding with the Code. **Grade:**	Student has complete understanding how the code is working and knows the concept.	Student has good understand but some place he does not know the concepts	Student has a very little understand and lack the major concepts.	Student does not have any level of understanding of the code.