PACMAN PSEUDOCODE

Project Description

Recreate the classic arcade game “PACMAN”

This is a single screen game in which the player controls a character while being pursued by a group of 3 computer controlled ghosts.

The game is set within a 2D maze, where the player moves using the four keyboard arrow keys . As PacMan moves through the maze, he will consume food, one per square of the maze. The objective is to clear the maze of all food without being touched by any of the ghosts.

Game Components

Pacman

Pacman is controlled by the player and can only move left to right, up and down. He can move anywhere within the maze, but must not pass through any of the walls throughout. As he moves, he will pass over kibble objects which he will consume.

Ghosts

Three ghosts will be controlled by the computer. They constantly move inside the maze but cannot pass through any walls within it. Their objective is to try to come into physical contact with Pacman.

Kibble

At the beginning of the game, a piece of kibble is placed within each square in the maze. PacMan consumes the kibble once he comes into contact with it. The kibble will disappear from the maze once consumed.

Maze

The maze is the playing area of the game and consists of a series of walls that will block progress of both PacMan and the ghosts. Players must constantly navigate through the maze to be successful. The maze consists of a 20 x 20 grid, and remains in place through the entire game.

NOTE: playable maze area is 20 x 20, actual grid size is 22 x 22

Point Scoring

The user scores points each time they consume a piece of kibble.

Game Completion

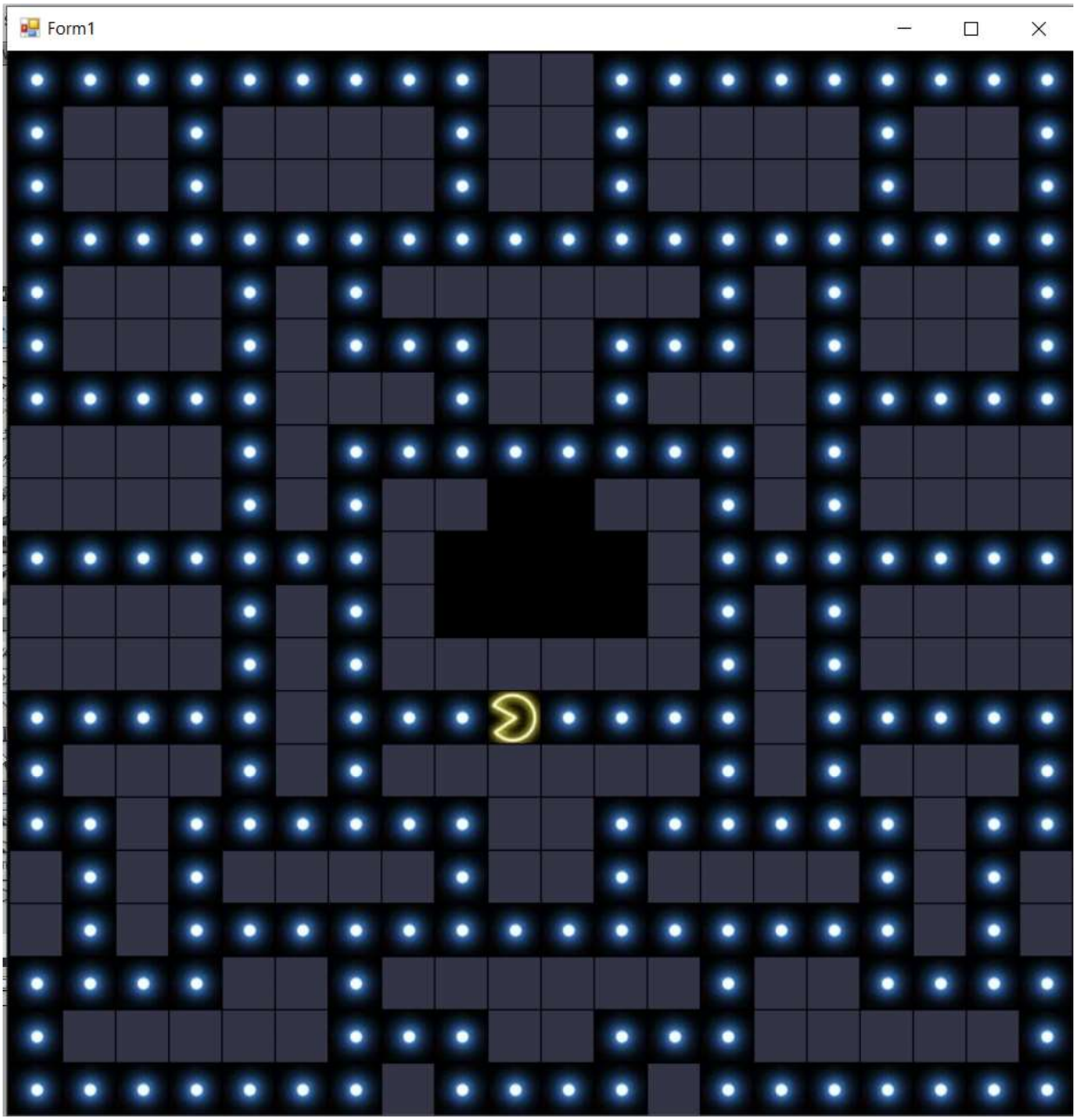
The user wins the game when all kibble has been consumed.

Game defeat

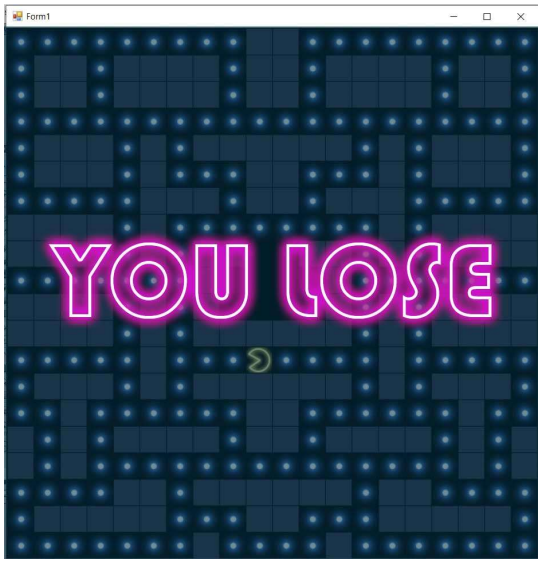
The player looses a life if they come into contact with a ghost. If they lose three lives, the game is over.

Form Design

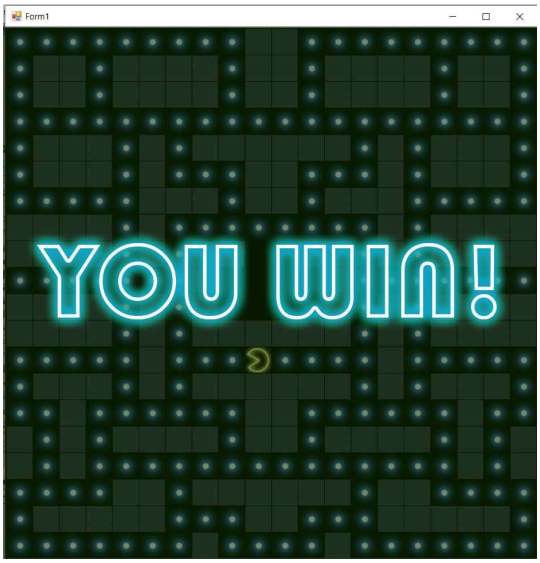
Proposed Playing Area



Lose Screen



Win Screen



Controls & Components

Timer

Used to move set events forward at a predetermined interval.

Player Interaction

The player will be able to control the horizontal and vertical movement of PacMan, but will be limited by the position of walls in the maze.

Computer Control

The computer controls the three ghosts that are pursuing PacMan. They will generally move randomly around the maze, but will move in the direction of Pacman if he comes within their view.

The computer will also keep score, reset the playing area and determine when the player wins, and when a player loses.

Events

Timer Tick

The game runs via a timer set at predetermined intervals. Each tick of the timer will run a method from the world class which runs all events within the game.

Key inputs

The form will detect key inputs entered by the user to determine movement of the PacMan object

First Iteration

Minimum Viable Product

MVP will draw the playing area maze, along with the Pacman object, and a ghoul object.

Classes

Controller Class

Behaviors

Run the order of events for each tick of the timer

Field Data

Pacman Object

Maze Object

Ghoul1 Object

Maze Class

Behaviors

Draws the maze which acts as the playing area of the game.

Updates the maze accordingly

Field Data

Map String

Kibbles remaining

Wall Bitmap

Kibble bitmap

Blank square bitmap

Creatures Class

Behaviors

Parent class to ghouls and Pacman objects

Field Data

Maze

List to store animation frames

PacMan Class

Behaviors

Draws the Pacman frames for animation

Determines the movement of Pacman

Determines the position of Pacman within the maze

Field Data

Position

Frames

Ghoul Class

Behaviors

Draws the ghoul frames for animation

Determines the movement of the ghoul

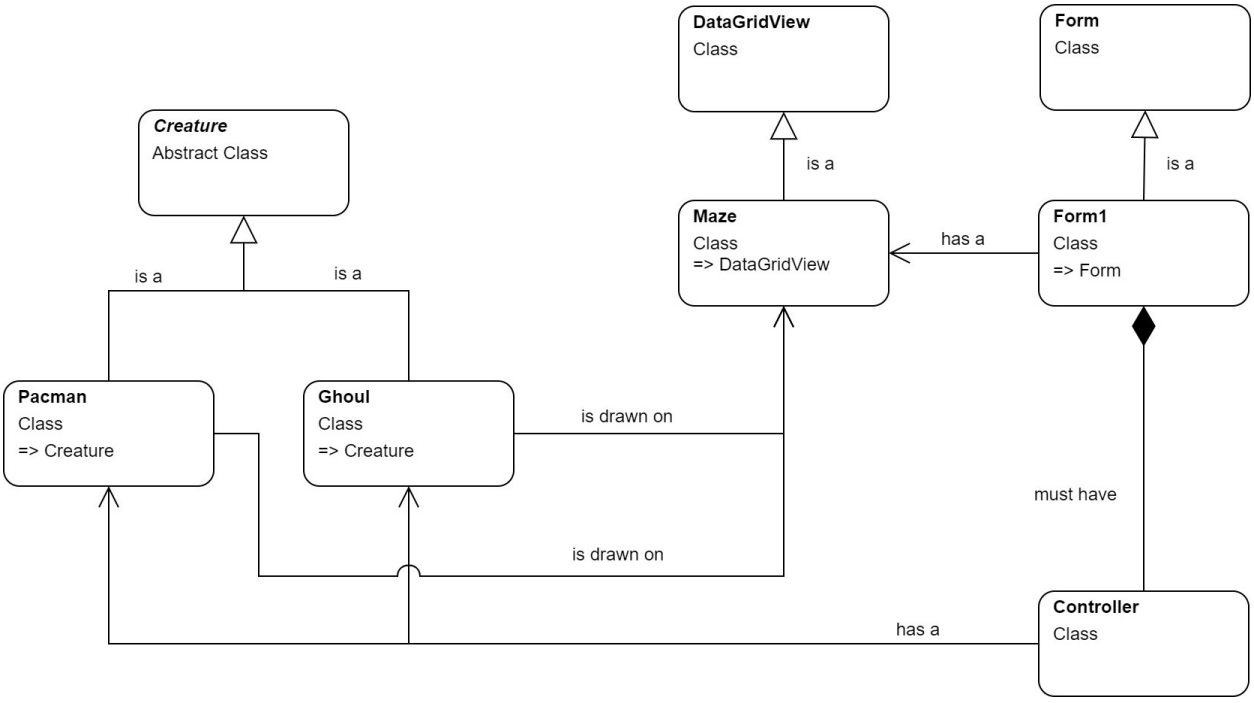
Determines the position of ghoul within the maze

Field Data

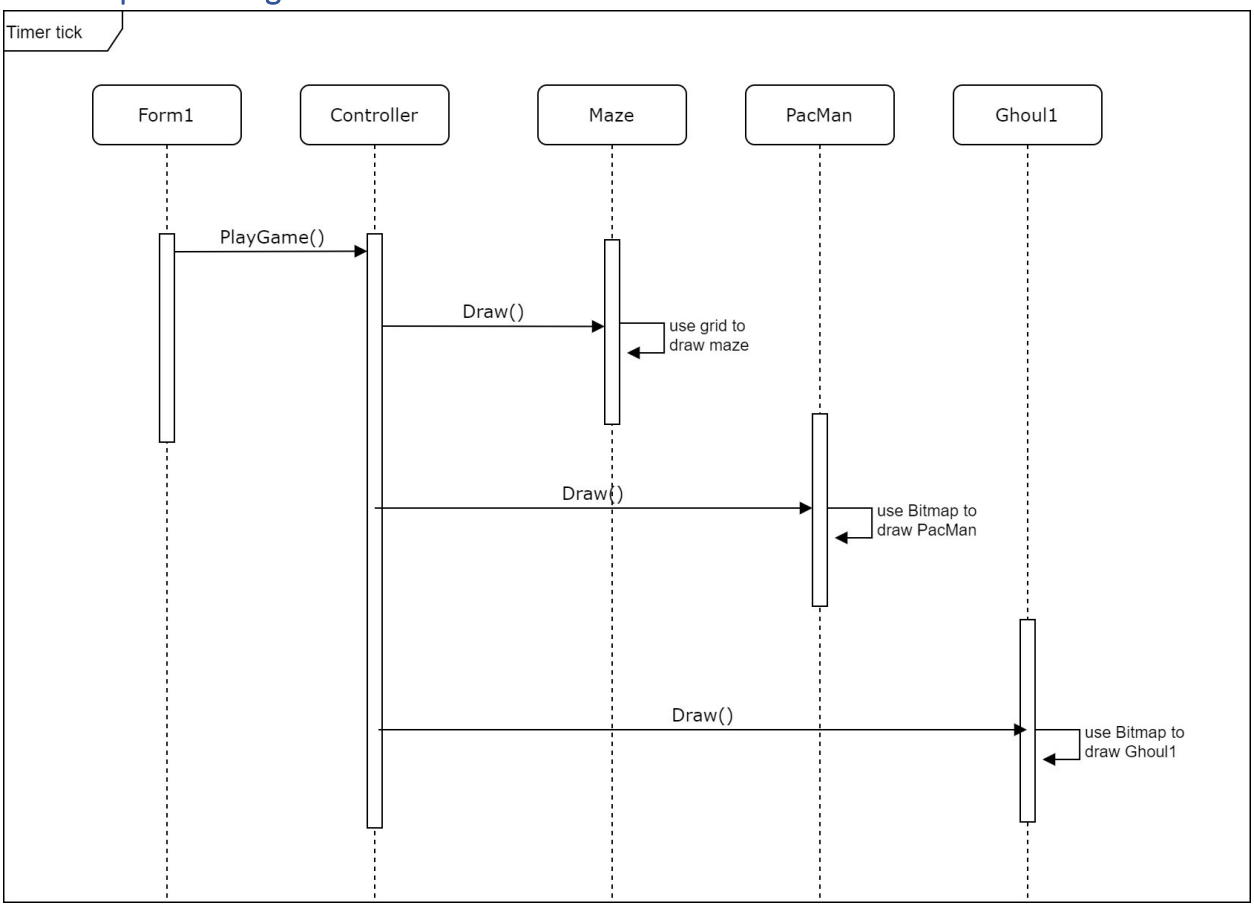
Position

Frames

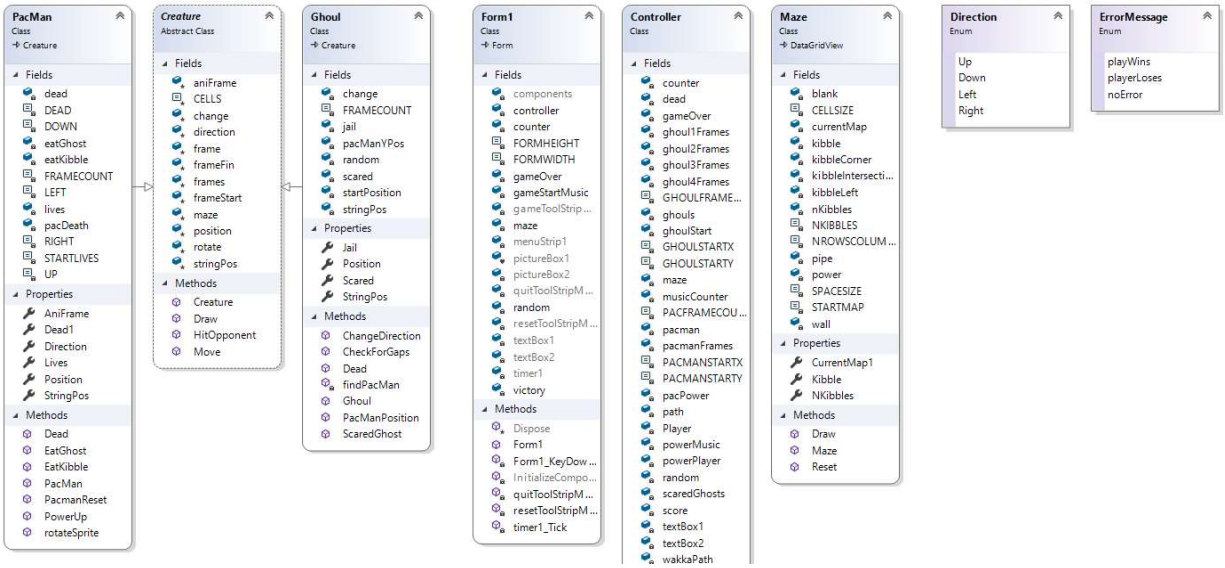
MVP UML Diagram



MVP Sequence Diagram



UML Diagram


PacMan
Class
Creature
Fields
dead
DEAD
DOWN
eatGhost
eatKibble
FRAMECOUNT
LEFT
lives
pacDeath
RIGHT
STARTLIVES
UP
Properties
AniFrame
Dead1
Direction
Lives
Position
StringPos
Methods
Dead
EatGhost
EatKibble
PacMan
PacmanReset
PowerUp
rotateSprite
Creature
Abstract Class
Fields
aniFrame
CELLS
change
direction
frame
frameFin
frames
frameStart
maze
position
rotate
stringPos
Methods
Creature
Draw
HitOpponent
Move
Ghoul
Class
Creature
Fields
change
FRAMECOUNT
jail
pacManYPos
random
scared
startPosition
stringPos
Properties
Jail
Position
Scared
StringPos
Methods
ChangeDirection
CheckForGaps
Dead
findPacMan
Ghoul
PacManPosition
ScaredGhost
Form1
Class
Form
Fields
components
controller
counter
FORMHEIGHT
FORMWIDTH
gameOver
gameStartMusic
gameToolStrip...
maze
menuStrip1
pictureBox1
pictureBox2
quitToolStripM...
random
resetToolStripM...
textBox1
textBox2
timer1
victory
Methods
Dispose
Form1
Form1_KeyDow...
InitializeCompo...
quitToolStripM...
resetToolStripM...
timer1_Tick
Controller
Class
Fields
counter
dead
gameOver
ghoul1Frames
ghoul2Frames
ghoul3Frames
ghoul4Frames
GHOULFRAME...
ghouls
ghoulStart
GHOULSTARTX
GHOULSTARTY
maze
musicCounter
PACFRAMECOU...
pacman
pacmanFrames
PACMANSTARTX
PACMANSTARTY
pacPower
path
Player
powerMusic
powerPlayer
random
scaredGhosts
score
textBox1
textBox2
wakkaPath
Maze
Class
DataGridView
Fields
blank
CELLSIZE
currentMap
kibble
kibbleCorner
kibbleIntersecti...
kibbleLeft
nKibbles
NKIBBLES
NROWSCOLUM...
pipe
power
SPACESIZE
STARTMAP
wall
Properties
CurrentMap1
Kibble
NKibbles
Methods
Draw
Maze
Reset
Direction
Enum
Up
Down
Left
Right
ErrorMessage
Enum
playWins
playerLoses
noError