# Milestone 7 – Mine Sweeper

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## Problem / Question

Create a visually appealing, functionally superior Mine-Sweeper application for serious game play using C#.NET and Visual Studio

## Hypothesis

- Create C# classes, interfaces, enumerations and forms to handle data storage, models, logic controllers and services to support all aspects of the Mine Sweeper game. Utilize advanced techniques in C# to store/retrieve persistent data; Create and utilize custom and existing libraries for visually appealing presentation.
- Design processes incrementally – confirming results in stages

## Project Overview

1. Develop application logic and flesh it out in a wireframe
2. Design Classes to model data and logic
3. Create UML documents and define dependencies / relationships
4. Create Flowcharts, initial logic; updated version with classes
5. Write C# code – confirm that it follows flowchart logic
6. Create videos to demonstrate effective progress in each step
7. Modify code to final stage to produce visually appealing product
8. Modify UML diagram to more accurately represent final product
9. Produce a poster that highlights the process

## Classes / Research

### Model Classes

Board.cs
Cell.cs
GameService.cs
IBoard.cs
ICell.cs
IGameResize.cs
IGameService.cs
ILevel.cs
Level.cs
IPlayerStats.cs
IPlayerStatsManager.cs
PlayerStats.cs
PlayerStatsManager.cs

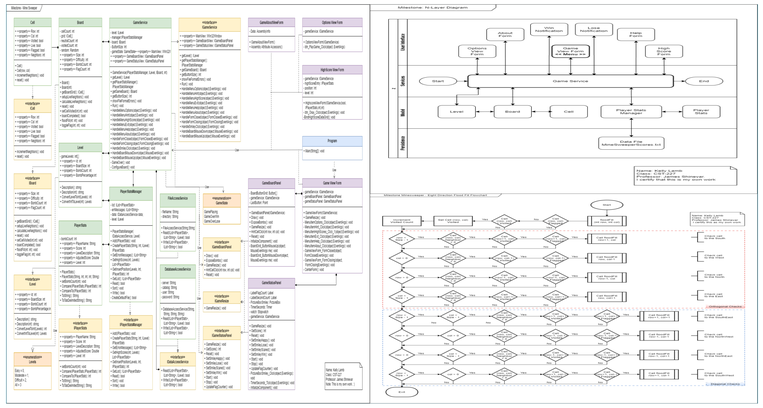
### Data Access Classes

DatabaseAccessService.cs
FileAccessService.cs
IDataAccessService.cs
IPlayerStats.cs
IPlayerStatsManager.cs
PlayerStats.cs
PlayerStatsManager.cs

### Visual Classes

AboutViewForm.cs
GameBoardPanel.cs
GameStatusPanel.cs
GameViewForm.cs
HighScoreViewForm.cs
IGameBoardPanel.cs
IGameStatusPanel.cs
OptionsViewForm.cs

## Flow Chart / UML



## Procedure - Milestones

### Step 1

Design initial logic flowchart, mockups, wireframes

### Step 2

Design Data Model - ADT, UML, Wireframe, N-Layer

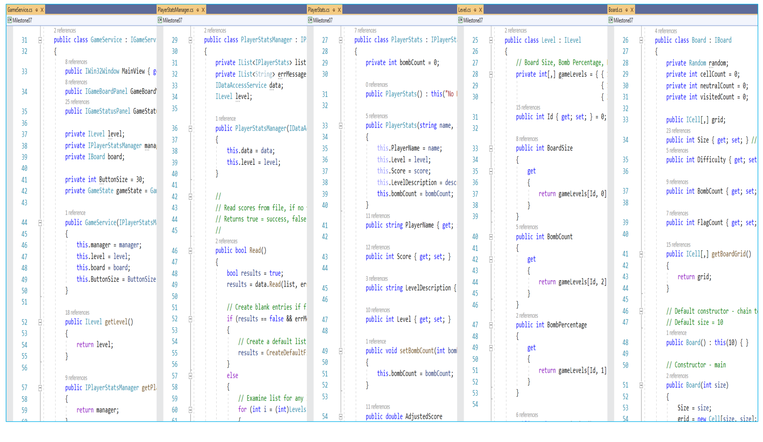
### Step 3

Incremental Design, Write, Test, Research C#.NET

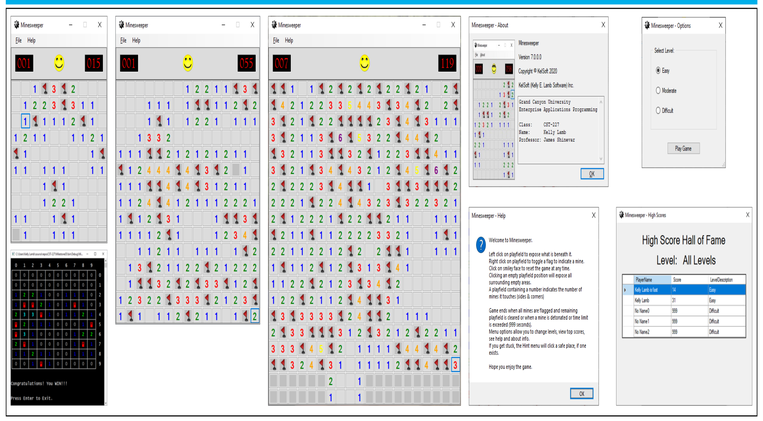
### Step 4

Create Visual classes and merge with data model

## Base Code Snippets



## Results - Screenshots



- Application initializes, loads data, handles all process requirements
- Screenshots: Represents all implemented functionality
- Each GUI Level, Console Version (Easy), About, Options, Help, and High score forms
- Number of classes: 16 (excluding form designer)
- Number of form layouts: 8
- Number of lines: C# code: 4,934

## Conclusion

- Minesweeper – Surprisingly fun to design and code but provided strong logic requirements, decisions, and solid OOP analysis and code constructs.
- Flowchart, UML, Wireframe, and N-Layer Diagrams are great tools to help in the design process
- Visual Studio offers a robust graphics programming platform but required significant research and understanding – many tutorials online.
- Very satisfying outcome watching everything work together.

## Works Cited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