Boggle Game

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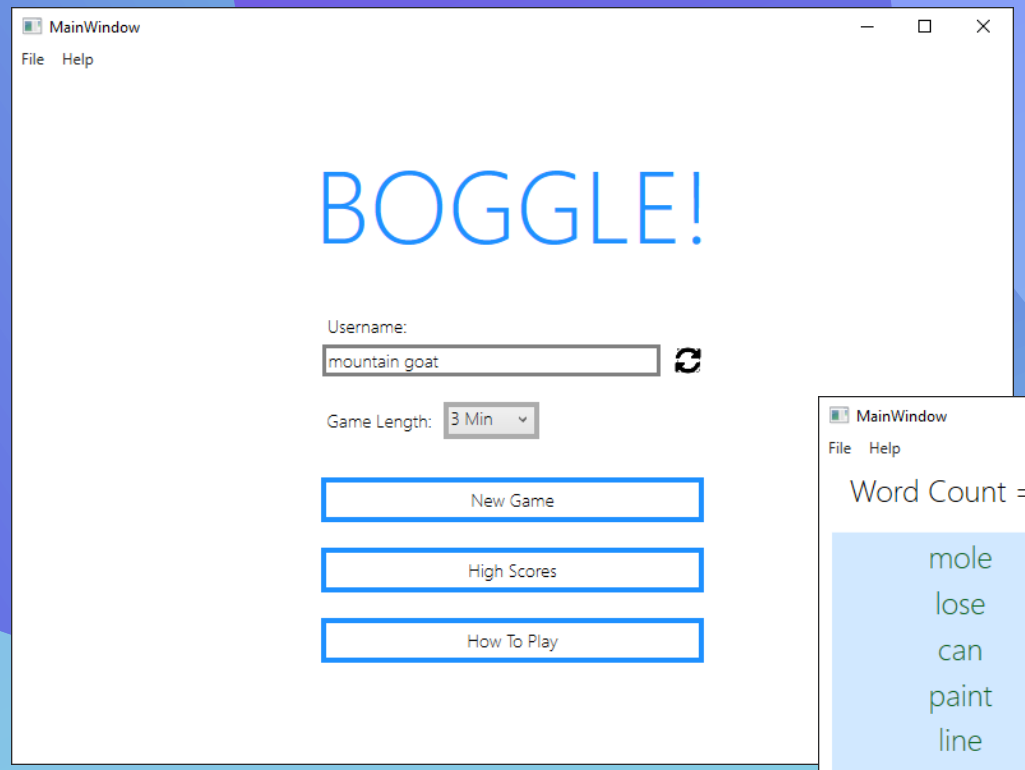
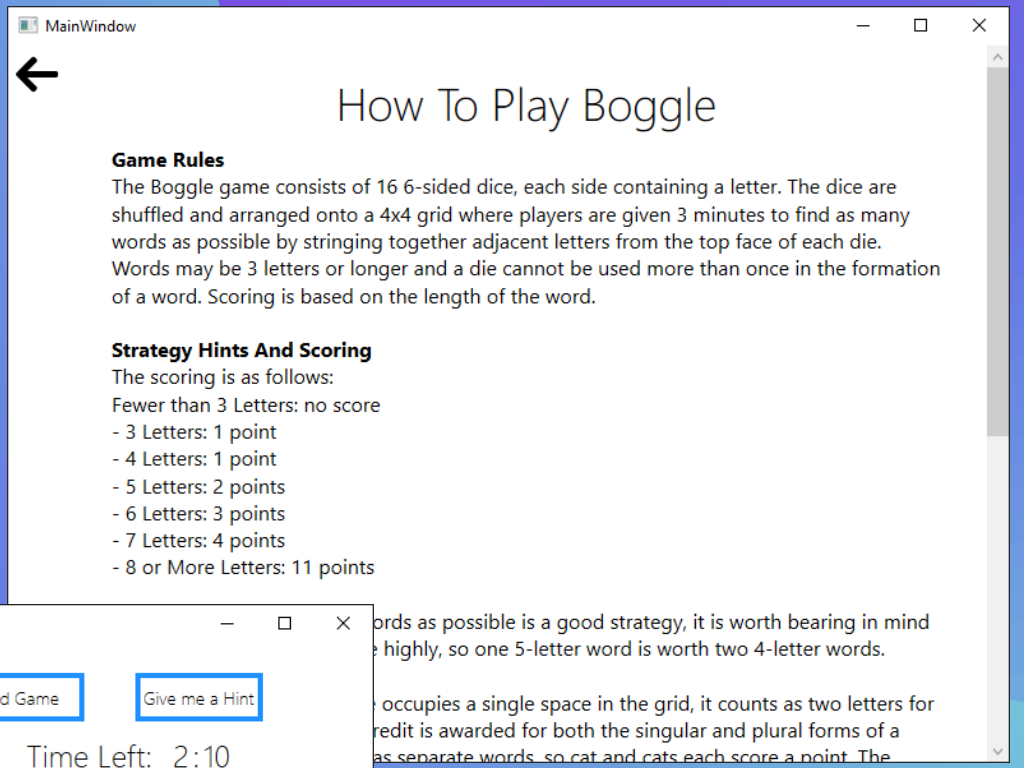
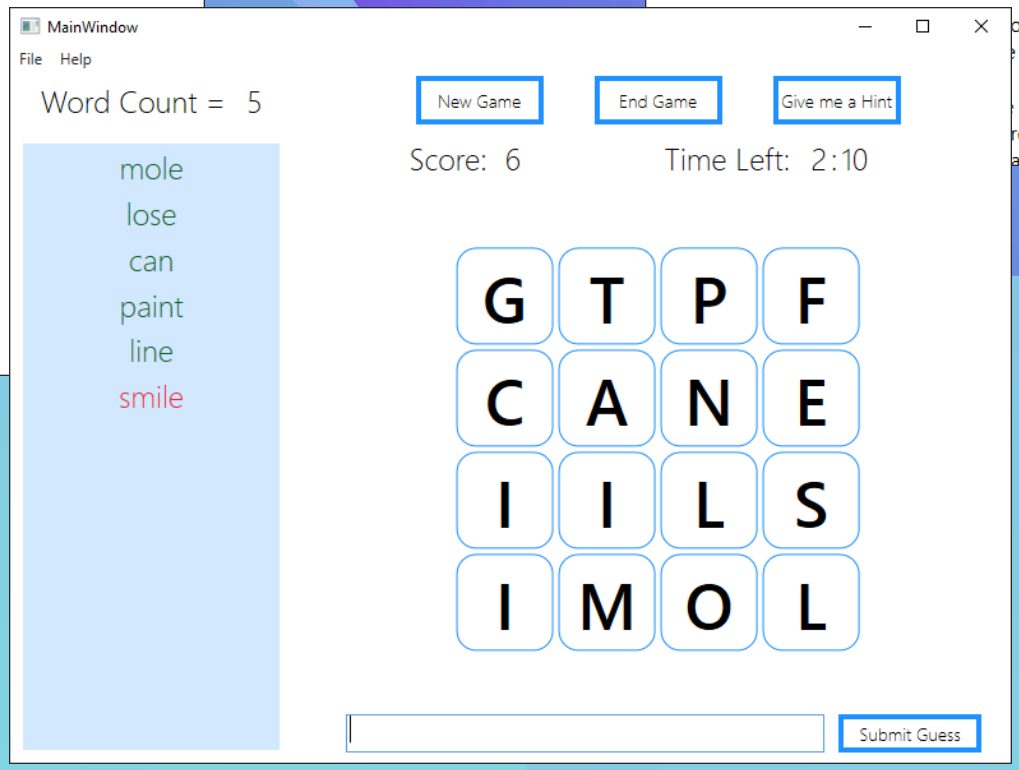
Boggle Basics

- *The player is presented a 4x4 matrix of letters*
- *The object of the game is to find as many words of length three or in three minutes*
- *Form words created out of adjoining letters, it is valid to move across diagonally*
- *Words are scored according to the number of letters used*

Screenshots







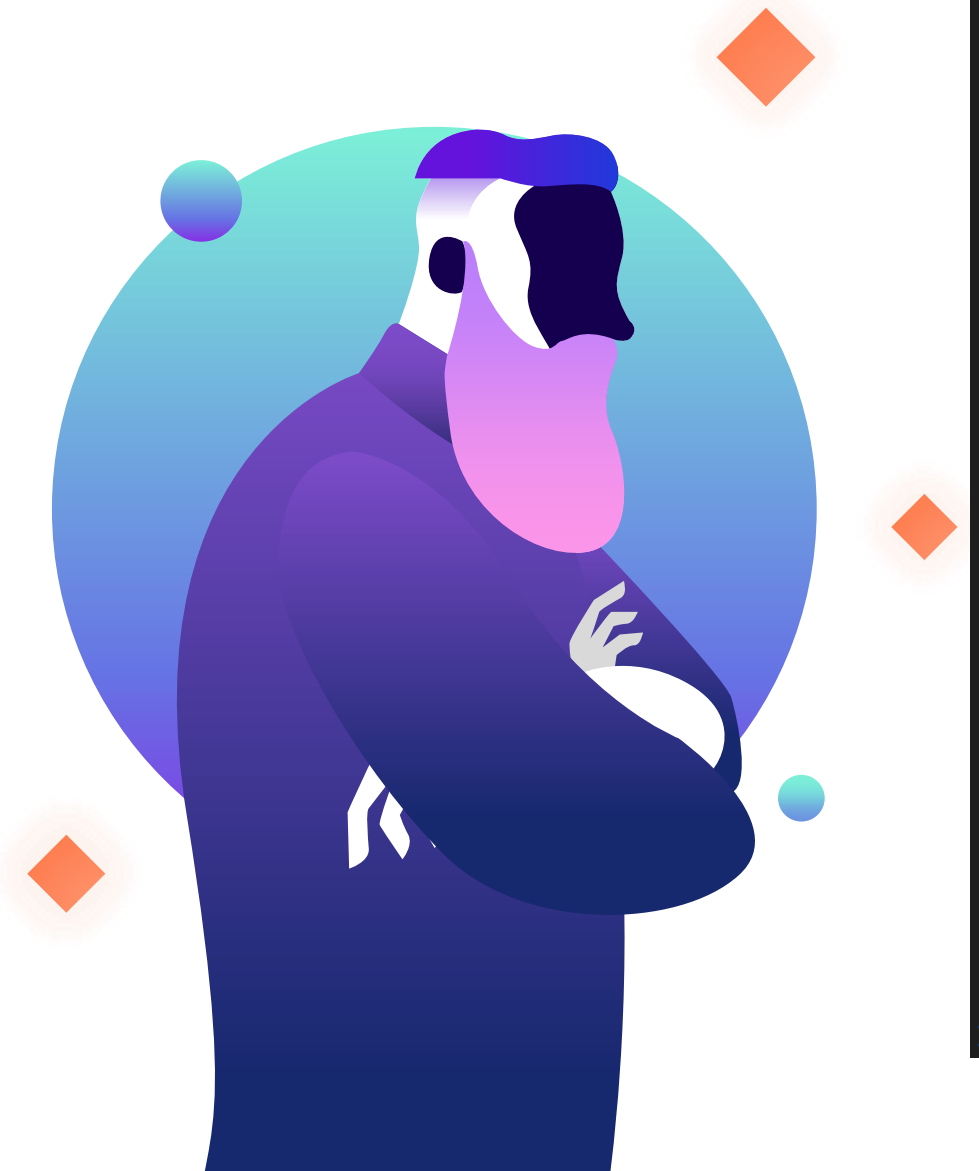
My Code – Unit Tests

```
[SetUp]
public void SetUp()
{
    //Setup test game grid
    string[] r1 = new string[4] { "S", "E", "R", "S" };
    string[] r2 = new string[4] { "P", "A", "T", "G" };
    string[] r3 = new string[4] { "L", "I", "N", "E" };
    string[] r4 = new string[4] { "S", "E", "R", "S" };
    string[][] grid = new string[4][] { r1, r2, r3, r4 };
    BoggleGame = new BoggleGame("FakeUser", 0);
    BoggleGame.GameBoard.GameGrid = grid;
    gameVM.TheGame = BoggleGame;
    BoggleGame.ListOfPossibleAnswers = possibleGuesses;
}
```

```
[TestCase("pal ", 1)]
[TestCase("ale", 1)]
[TestCase("Hi!", 0)]
[TestCase("pig", 0)]
public void Test3LetterScoreIsCalculatedCorrectly(string word, int expectedScore)
{
    gameVM.UserGuess = word;
    gameVM.SubmitGuessCommand.Execute(null);
    Assert.AreEqual(expectedScore, gameVM.TheGame.GetScore());
}

[TestCase("sang", 1)]
[TestCase(" line", 1)]
[TestCase("lats", 1)]
[TestCase("bear ", 0)]
public void Test4LetterScoreIsCalculatedCorrectly(string word, int expectedScore)
{
    gameVM.UserGuess = word;
    gameVM.SubmitGuessCommand.Execute(null);
    Assert.AreEqual(expectedScore, gameVM.TheGame.GetScore());
}
```

My Code – Game Logic



```
public void SubmitGuess(string Word)
{
    //Check if the user entered a duplicate guess
    foreach(PlayerGuess g in ListOfGuesses)
    {
        if (g.Guess == Word.ToLower())
            return;
    }

    bool isGuessOnGameGrid = ListOfPossibleAnswers.Contains(Word.ToUpper());
    ListOfGuesses.Add(new PlayerGuess() { Guess = Word.ToLower(), IsValidGuess = isGuessOnGameGrid });

    if (isGuessOnGameGrid)
    {
        WordCount++;
        int wordLength = Word.Count(w => char.IsLetter(w));
        if (wordLength < 3)
            return;

        switch (wordLength)
        {
            case 3: Score += 1;
                break;
            case 4: Score += 1;
                break;
            case 5: Score += 2;
                break;
            case 6: Score += 3;
                break;
            case 7: Score += 4;
                break;
            //return a score of 11 points if the length of the word is greater than 8 letters
            default: Score += 11;
                break;
        }
    }
}
```

Design Decisions & Tradeoffs

Navigation

- *One page versus*
- *Multiple pages*
- *Creation of multiple view models*

Providing Feedback to the player

- *Visual feedback*
- *Showing previously entered guesses*
- *How to handle duplicate guesses*
- *Asynchronous timer*

How to validate player guesses

- *Find all possible words on the grid*
- *Check the grid for each guess entered*

What I learned

- *Azure DevOps and creating a build pipeline*
- *The importance of TDD and creating high quality unit tests*
- *Using a code first approach to database creation*