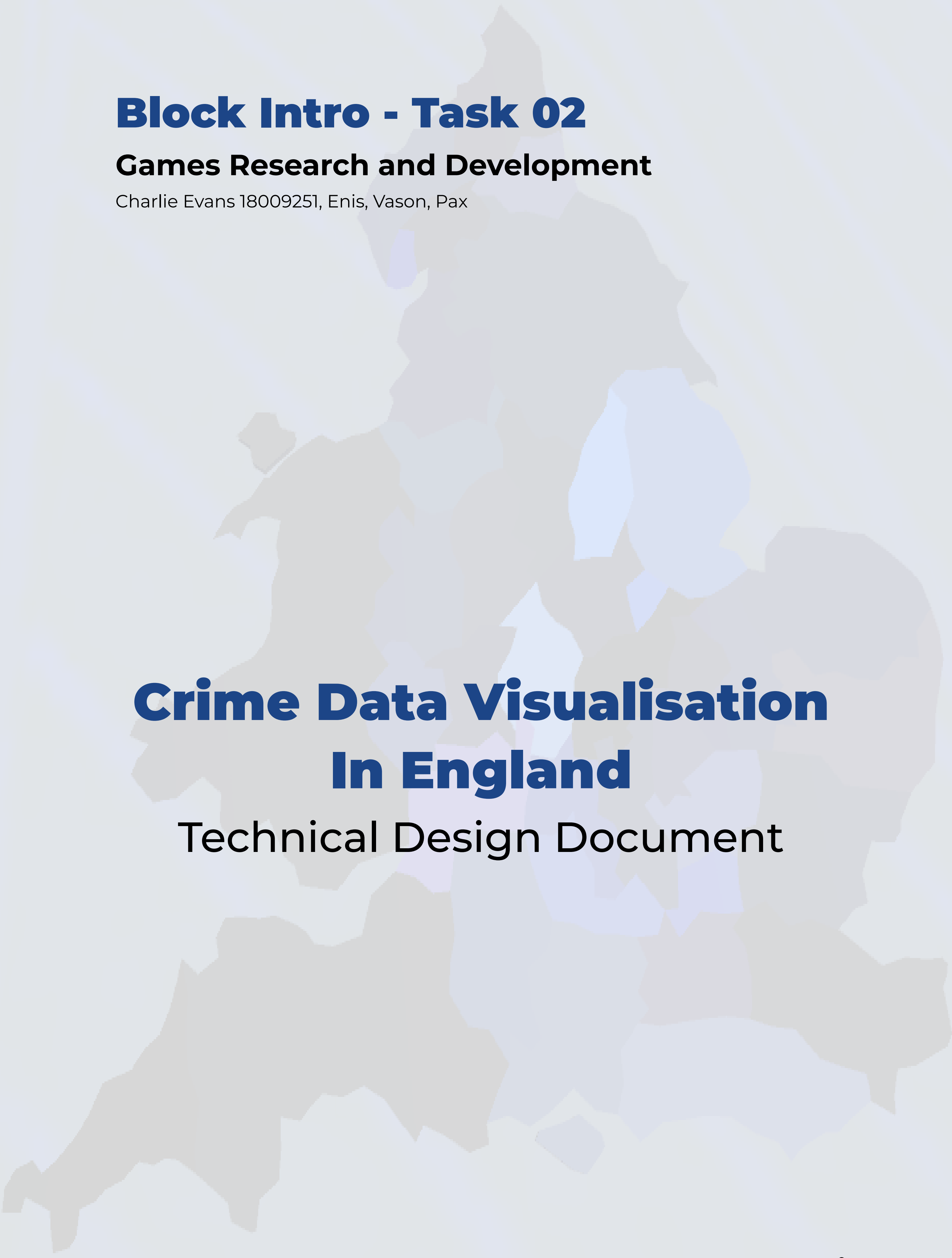

Block Intro - Task 02

Games Research and Development

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Crime Data Visualisation In England

Technical Design Document

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SUMMARY OVERVIEW FROM GDD

Crime data visualisation across England's counties demonstrated in an educational guessing game. A crime category and year is picked, and then player's must compete to guess which of two selected counties has the lowest crime cases for that crime category.

OBJECTIVES

- Produce a prototype that demonstrates visualisation of some real-world scientific data
- The data should be interactive and "playable"
- Make a "Serious Game"

TECHNICAL RISKS

This project poses some technical risks that must be taken into consideration.

- **Performance** - Trying to pull too much data at once from a file, or from an API, could result in a drop in performance.

CHOICE OF GAME ENGINE

We chose to develop the project within the **Unity** game engine because of our team's familiarity and experience with it. Due to the limited time available for producing the prototype we thought Unity would be the ideal choice as it is perfect for playing around with ideas and quickly producing prototypes.

SUMMARY OF FEATURES FROM GDD

- Dataset Reader
- Api Requester [ARCHIVED]
- Turn System

- Map Camera
- County Selector
- Crime Selector
- Year Selector
- Crime Colour Gradient
- County Crime Facts

CODE STYLE GUIDELINES

https://avangarde-software.com/unity-coding-guidelines-basic-best-practices/

NAMING CONVENTIONS

- PascalCase for namespaces, classes, methods, static fields, and properties.

```
namespace Ui.MainMenu
{
    public class SomeClass
    {
        public static int SomeStaticField = 1;
        public int SomeProperty { get; set; }
        private void SomeMethod();
    }
}
```

- camelCase for fields and method arguments. (Prefix private fields with “_”).

```
private float _someField;
public void SomeMethod(int someArgument);
```

- Prefix events and actions with “On”.

```
public event Action OnSomeEvent;
public event UnityEvent OnSomeOtherEvent;
```

BEST PRACTICES

- Using access level modifiers.

```
int _somePrivateVariable; // bad
private int _somePrivateVariable; // good
```

- Prefix interfaces with an “**I**”, and typically ending with the suffix “**able**”.

```
public interface IDamageable
```

BRANCHING POLICY

Something akin to the example model shown below. **Leave the Main branch alone**. Create a branch off of the **Develop** branch for each new feature and merge it to **Develop** when the feature is complete and bug-free (to the best of your knowledge).

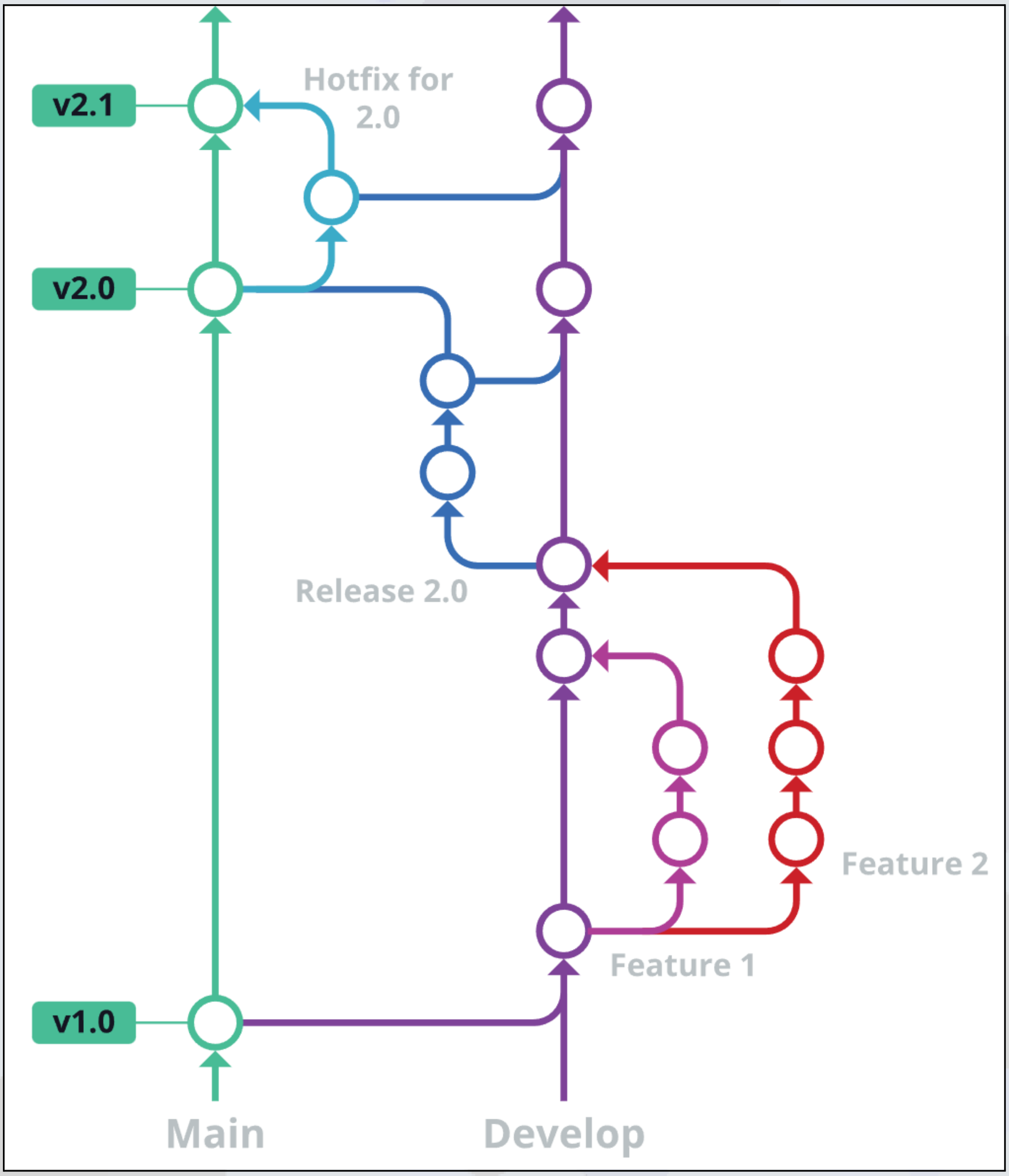
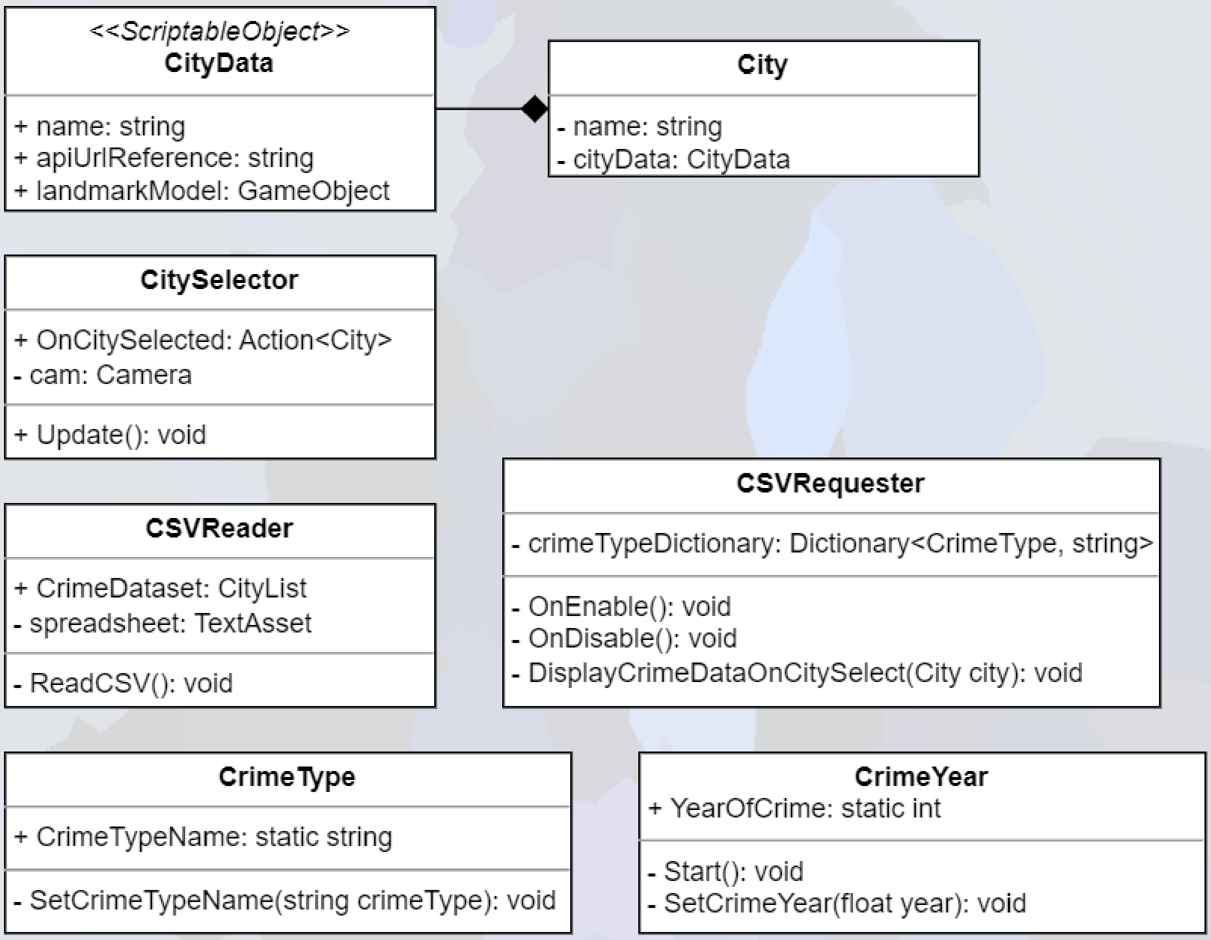


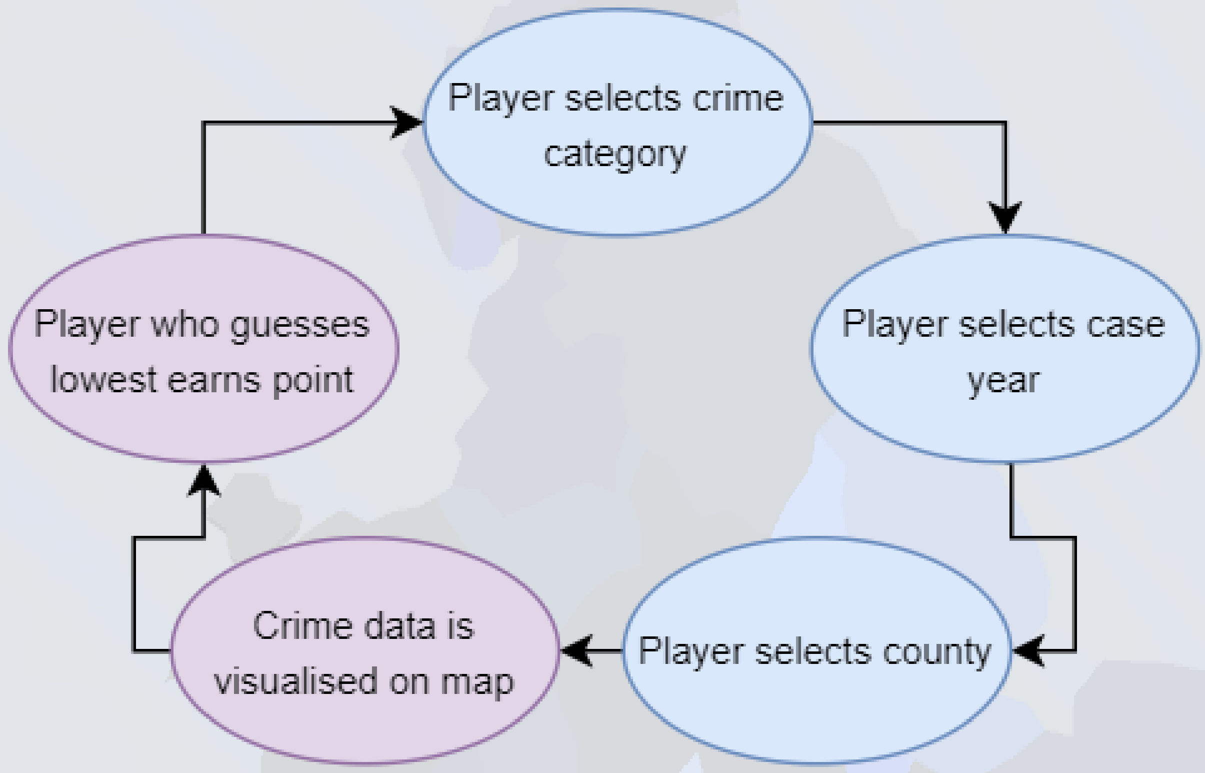
Diagram sourced from: [What is Git Flow | How to use Git Flow | Learn Git]

HIGH-LEVEL DIAGRAMS

Initial UML

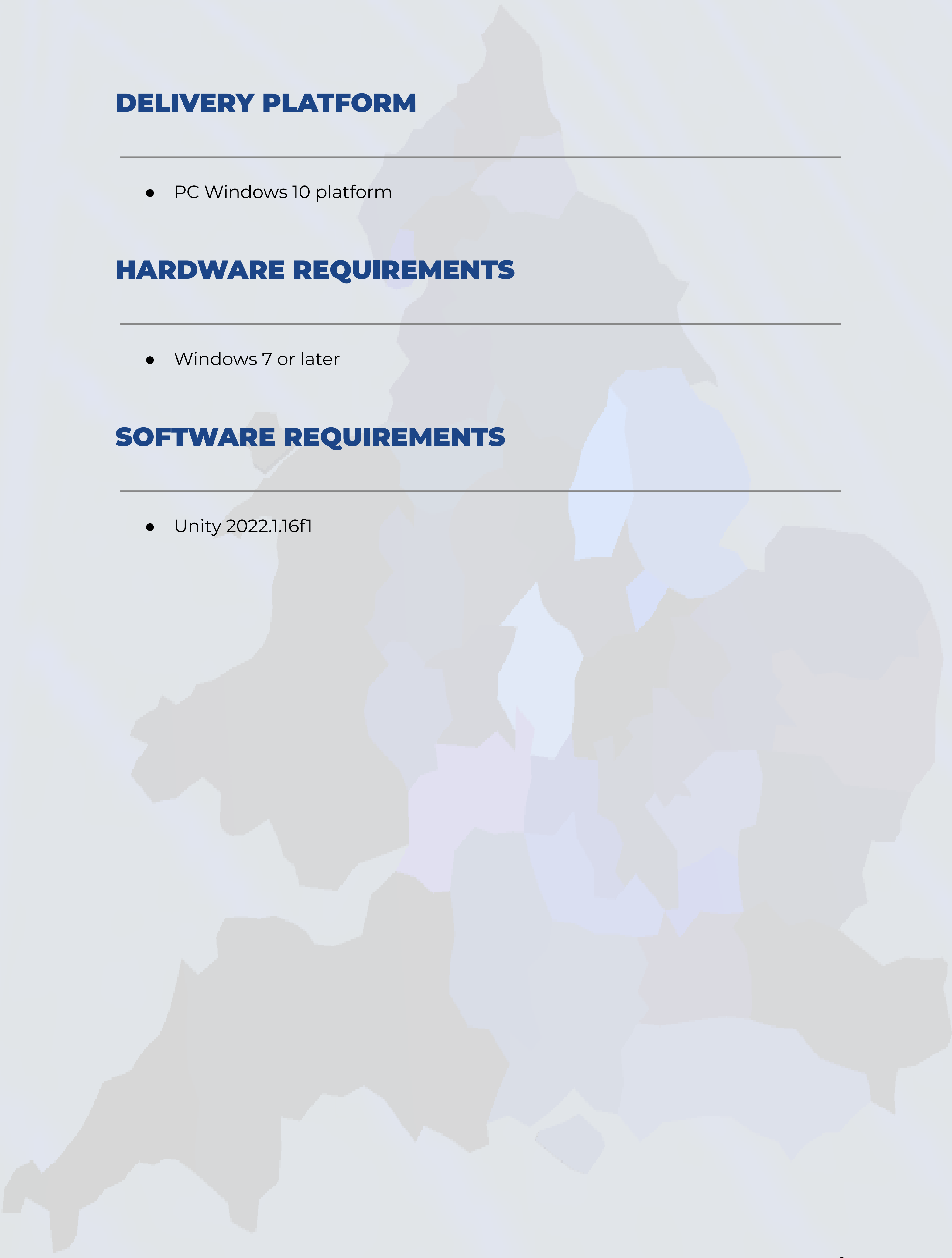

<<ScriptableObject>>
CityData
+ name: string
+ apiUrlReference: string
+ landmarkModel: GameObject
City
- name: string
- cityData: CityData
CitySelector
+ OnCitySelected: Action<City>
- cam: Camera
+ Update(): void
CSVReader
+ CrimeDataset: CityList
- spreadsheet: TextAsset
- ReadCSV(): void
CSVRequester
- crimeTypeDictionary: Dictionary<CrimeType, string>
- OnEnable(): void
- OnDisable(): void
- DisplayCrimeDataOnCitySelect(City city): void
CrimeType
+ CrimeTypeName: static string
- SetCrimeTypeName(string crimeType): void
CrimeYear
+ YearOfCrime: static int
- Start(): void
- SetCrimeYear(float year): void

GAME LOOP


Player selects crime category
Player selects case year
Player selects county
Crime data is visualised on map
Player who guesses lowest earns point

ASSETS USED

- **External libraries / packages**
  - TextMeshPro
- **Models**
  - Text
- **Textures / Materials**
  - Text
- **Audio**
  - Text
- **Data**
  - Crime data on England's counties
    - Data downloads | data.police.uk
  - Air quality data on England's cities
    - API - Air Quality Programmatic APIs



DELIVERY PLATFORM

- PC Windows 10 platform

HARDWARE REQUIREMENTS

- Windows 7 or later

SOFTWARE REQUIREMENTS

- Unity 2022.1.16f1