# Virtual Worlds

## Programming Assignment #1

Kang Hoon Lee

Department of Software
Kwangwoon University

# Easy 1: Camera Switcher

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- Create two or more different camera perspectives. You should be able to switch cameras by pressing left or right shift. Only one camera must be installed.

**Camera view example**

# Easy 2: Revival

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- If Player runs off the road and falls to the ground, make sure he can run back on the road.

**Example of revival**

# Medium 1: Oncoming Vehicles

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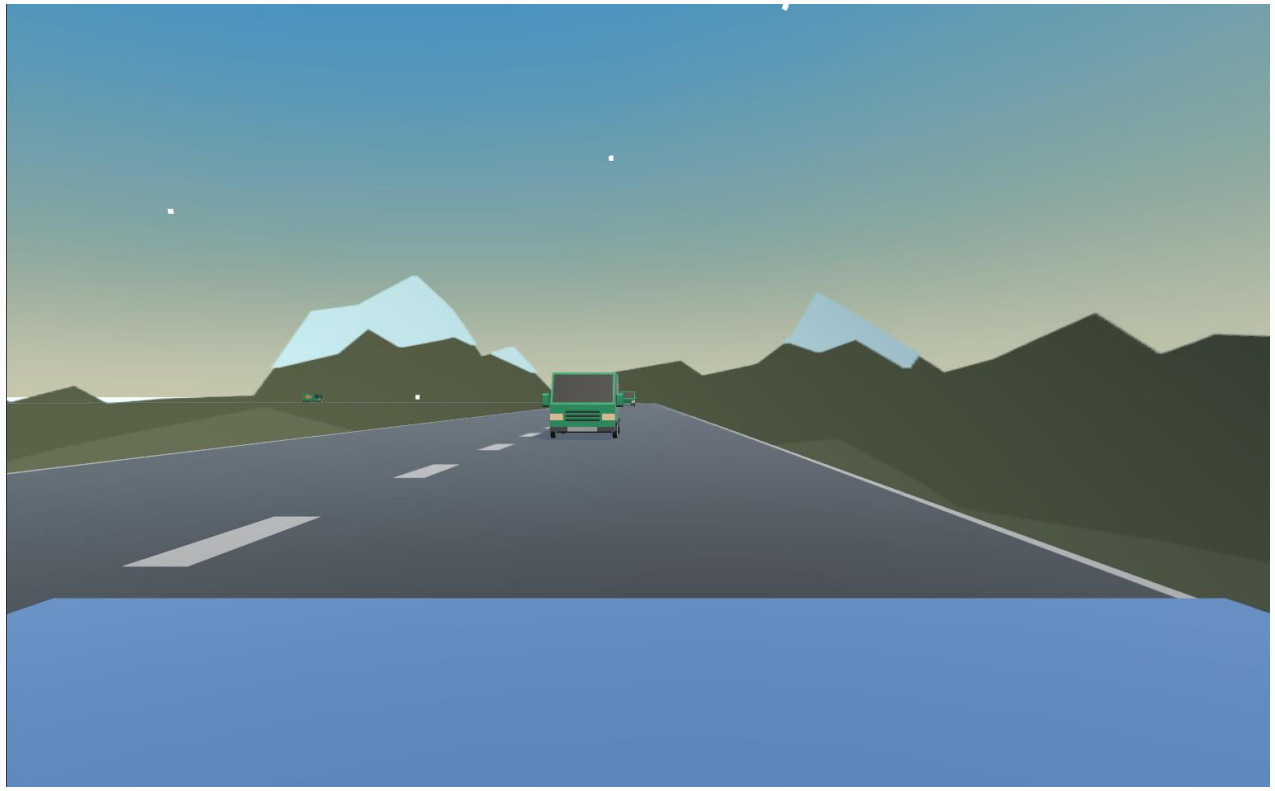
- Add three or more other cars that are automatically driving down the road in opposite direction, which the player also must avoid.



**Example of oncoming vehicles**

# Hard: Make a Curved Road Mesh

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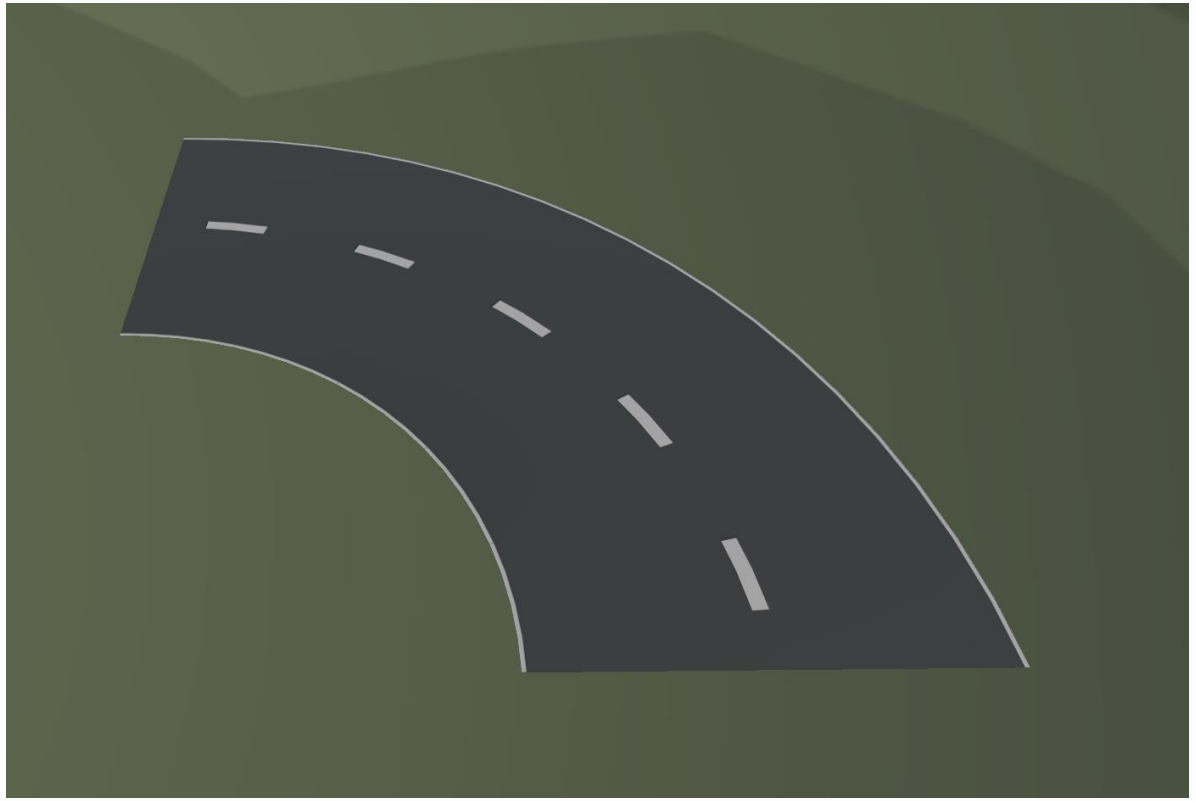
- Inherit the BaseMakeMesh code and Create a curved road. Turn the curved road you created into a Prefab.



**Example of curved road**

# Medium 2: Road Layout

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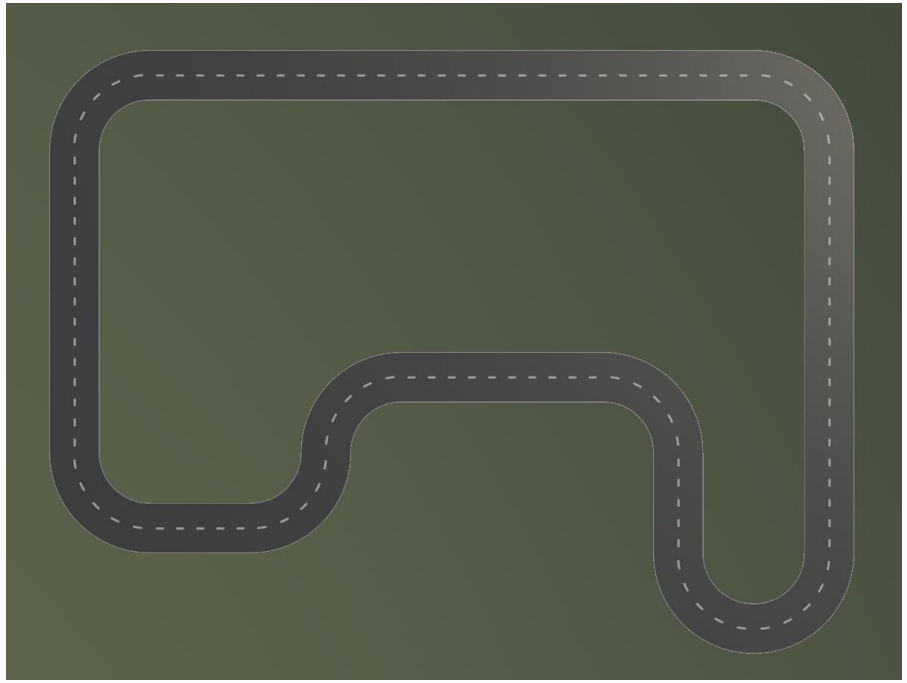
- ☐ Lay out roads with custom Prefabs. Roads should be closed and not simple squares.



**Road Example**

**Incorrect Road Example**

# Expert: Oncoming Behicle on Curved Road

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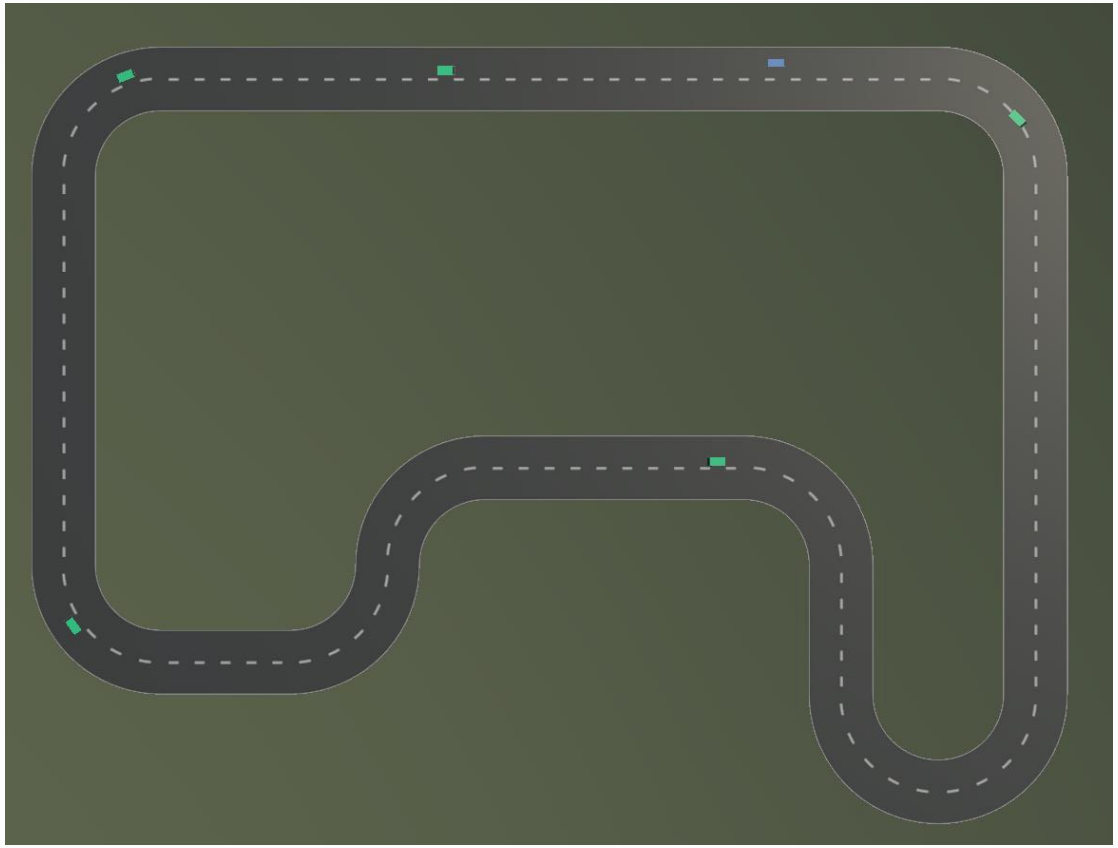
- Make cars driving down the road in opposite directions behave appropriately on curved roads.



**A car that moves appropriately on curved and straight roads**

# How to Create a Straight Road Mesh

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- Create a new Empty Object and rename it “Straight Road”
- In the “Scripts” folder, Right-click > Create > C# Script named “StraightRoadMesh”
- Attach the “Straight Road Mesh” script to the Straight Road
- Change base class from “MonoBehaviour” to “BaseMakeMesh”
- Add abstract classes(SetNormals, SetTriangles, SetUV, SetVertices)

```
public class StraightRoadMesh : BaseMakeMesh
{
    protected override void SetVertices()
    {
    }

    protected override void SetNormals()
    {
    }

    protected override void SetUV()
    {
    }

    protected override void SetTriangles()
    {
    }
}
```

# How to Create a Straight Road Mesh

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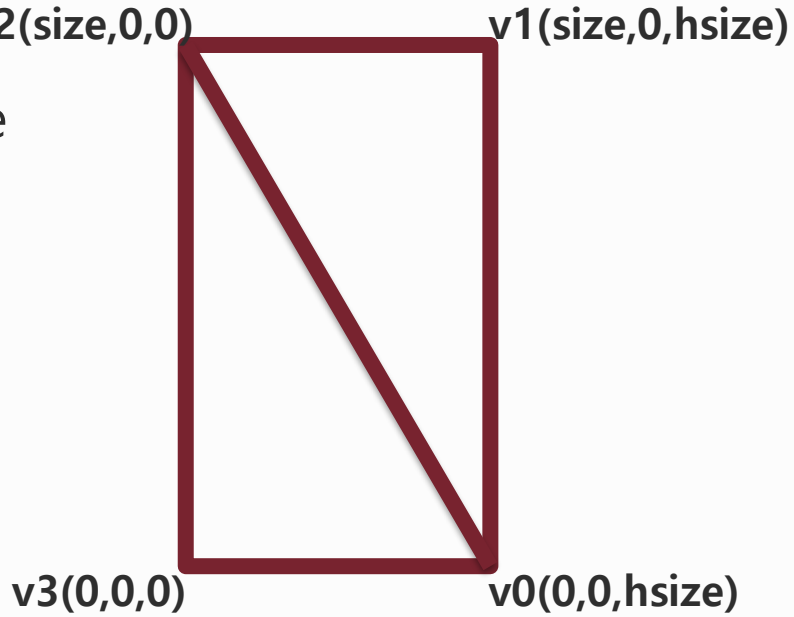
- Add 4 vertices and normals: Each point represents the end of a rectangular road
- Map the UVs like this: Each point is used to apply a texture
- Set up triangles to construct the following shapes




❖ hsize is half of size

```
protected override void SetVertices()
{
    vertices.Add(new Vector3(-0, 0f, hsize));
    vertices.Add(new Vector3(size, 0f, hsize));
    vertices.Add(new Vector3(size, 0f, -0));
    vertices.Add(new Vector3(-0, 0f, -0));
}

protected override void SetNormals()
{
    normals.Add(new Vector3(0f,-1f,0f));
    normals.Add(new Vector3(0f,-1f,0f));
    normals.Add(new Vector3(0f,-1f,0f));
    normals.Add(new Vector3(0f,-1f,0f));
}

protected override void SetUV()
{
    uv.Add(new Vector2(0,0));
    uv.Add(new Vector2(1,0));
    uv.Add(new Vector2(1,1));
    uv.Add(new Vector2(0,1));
}

protected override void SetTriangles()
{
    triangles.Add(0);
    triangles.Add(1);
    triangles.Add(2);
    triangles.Add(0);
    triangles.Add(2);
    triangles.Add(3);
}
```

# How to Create a Straight Road Mesh

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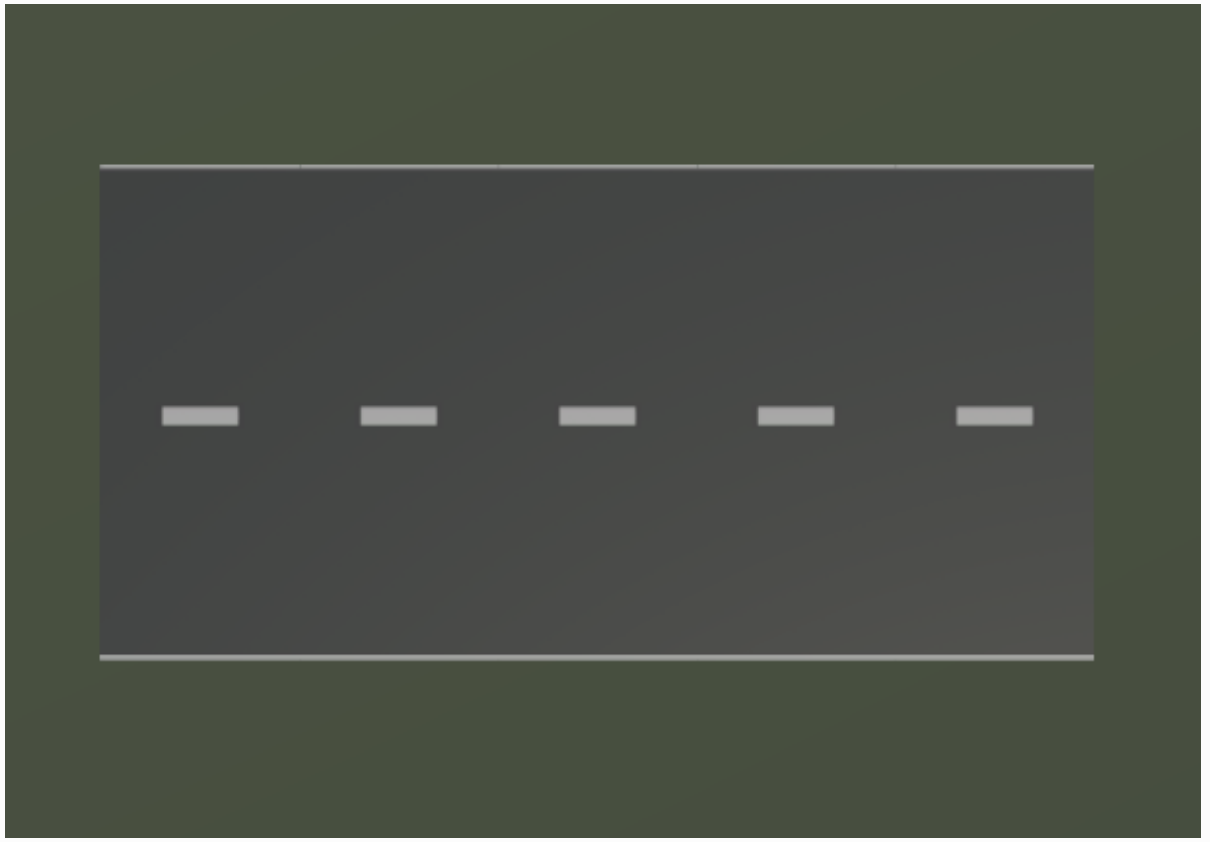
- Click on the “Straight Road” object to add the Road material to the mesh renderer.
- Run the editor and check if the mesh is created properly.



# Submission

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- **Report**
  - Title page
    - Course title, submission date, affiliation, student ID, full name
  - Fulfill table
    - A table to write down what you are satisfied with
    - An example is attached on the next page
  - For each requirement, explain how you fulfilled it
    - Do not just dump the entire code
    - It's okay to copy snippets of your code to complement written description
    - ❖ Capture and attach a screen shot for each result
  - Conclude with some comments on your work
    - Key challenges you have successfully tackled
    - Limitations you hope to address in the future
  - Add a link to a video that runs the program (e.g. YouTube)
    - Please take a video so we can clearly see what you achieved
    - When you click the link, the video should be played back without problems

# Submission

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☐ **Example of Fulfill Table**

| | | |
|---|---|---|
| Easy 1 | Camera switcher | O |
| Easy 2 | Revival | O |
| Medium 1 | Oncoming vehicles | O |
| Medium 2 | Road layout | X |
| Hard | Make a curved road mesh | O |
| Expert | Oncoming vehicle on curved road | X |

# Submission

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- **Compress your build folder, export file and report into a single *.zip file**
  - Export File
    - Export > Export Files
      - ❖ Once you have imported the provided unitypackage file, it will be in the top left menu.
    - The format of the export file is "packageFile.unitypackage".
  - Report
    - A single “report.pdf” file
    - ❖ You should convert your word format (*.hwp, *.doc, *.docx) to PDF format (*.pdf) before zipping
  - Name your zip file as your student ID
    - ❖ ex) 20xxxxxxxx.zip

❖ **NOTE: Before submitting, import the exported file into an empty project and check that it works well!**

- **Upload to homework assignment in KLAS**
- **Due at 4/16 (Wed) 11:59 PM**