CEE 678 CARLA Lab 2: Construction Cone Generation and Weather Customization

Prerequisites:

1. Success installation and running of CARLA. (version 0.9.12 is used in this tutorial)
2. A Python IDE to edit the Python scripts.

Load the CARLA Server and Client:

Server side:

1. Open the Command Prompt window, type or copy and paste the two commands and press Enter:

```
>> cd C:/{Your_Directory}/CarlaSimulator
>> CarlaUE4.exe
```

Since running CARLA requires strong graphical computing power, we recommend you run CARLA with low graphics quality to speed up the simulation:

```
>> CarlaUE4.exe -quality-level=Low
```

Client side:

1. Open a **new** CMD window, type the following commands to run the example Python client:

```
>> cd C:/{Your_Directory}/PythonAPI/examples
>> python manual_control.py
```

2. To run the customized code, you can type the following commands in the same way:

```
>> cd C:/{Your_Directory}/PythonAPI/examples
>> python set_construction_cone.py
```

or

```
>> python set_weather.py
```

Procedures to Generate Construction Cones:

Launch the server and follow steps in the example code `set_construction_cone.py.`

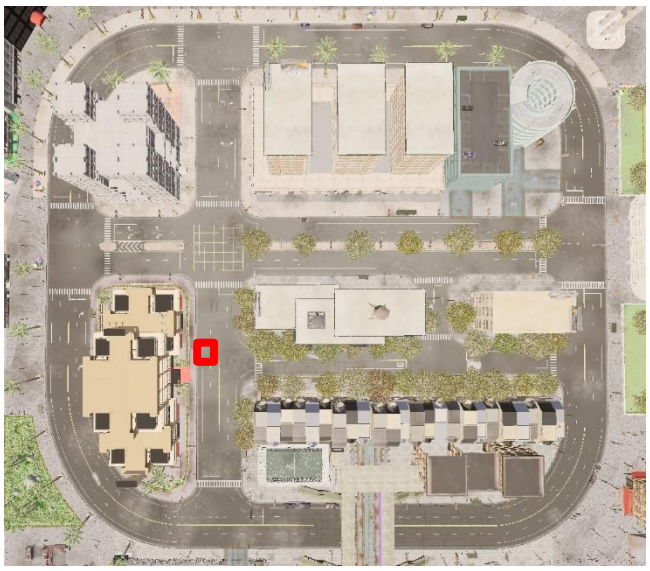
1. Choose a blueprint
   a. Initialize carla.BlueprintLibrary class
   ```
   blueprint_library = world.get_blueprint_library()
   ```

   b. Choose a blueprint for the traffic cone or construction cone. Class: carla.ActorBlueprint. CARLA provide many preset 3d models for the actors, including the vehicles, pedestrians, sensors, and many kinds of static objects in the real world. You can check out this page to choose a model you would like to show in the CARLA world. https://carla.readthedocs.io/en/latest/bp_library/. Feel free to change the parameter in the function `blueprint_library.find` ().
   ```
   cone_bp_1 = blueprint_library.find('static.prop.constructioncone')
   cone_bp_2 = blueprint_library.find('static.prop.trafficcone01')
   cone_bp_3 = blueprint_library.find('static.prop.trafficcone02')
   ```

2. Choose a spawn point. Class: carla.Transform
   a. Manually set a spawn point
   ```
   transform_1 = carla.Transform(carla.Location(x=-52, y=57, z=0))
   transform_2 = carla.Transform(carla.Location(x=-52, y=60, z=0))
   transform_3 = carla.Transform(carla.Location(x=-52, y=63, z=0))
   ```

3. Spawn the actor
   a. Spawn the vehicle. Class: carla.Actor
   ```
   cone_1 = world.spawn_actor(cone_bp_1, transform_1)
   cone_2 = world.spawn_actor(cone_bp_2, transform_2)
   cone_3 = world.spawn_actor(cone_bp_3, transform_3)
   ```

When you run the code `set_construction_cone.py`, you will find out that three cones are generated at this location.



Procedures to Set the Weather:

Launch the server and follow steps in the example code `set_weather.py`.

1. Get the weather object.

```
weather = world.get_weather()
```

2. Set the weather parameters. Two examples are provided. You can customize the parameters and design your weather condition. Check this link: https://carla.readthedocs.io/en/latest/python_api/#carla.WeatherParameters

```
# Example 1: foggy sunset
weather.sun_altitude_angle = -30
weather.fog_density = 65
weather.fog_distance = 10
world.set_weather(weather)
```

```
# Example 2: Rainy afternoon
weather.sun_altitude_angle = 10
weather.cloudiness = 10
weather.precipitation = 80
weather.precipitation_deposits = 60
world.set_weather(weather)
```