Steps for results generation:

Step 1: Download .osm file for the area to simulate from openstreetmap.org.

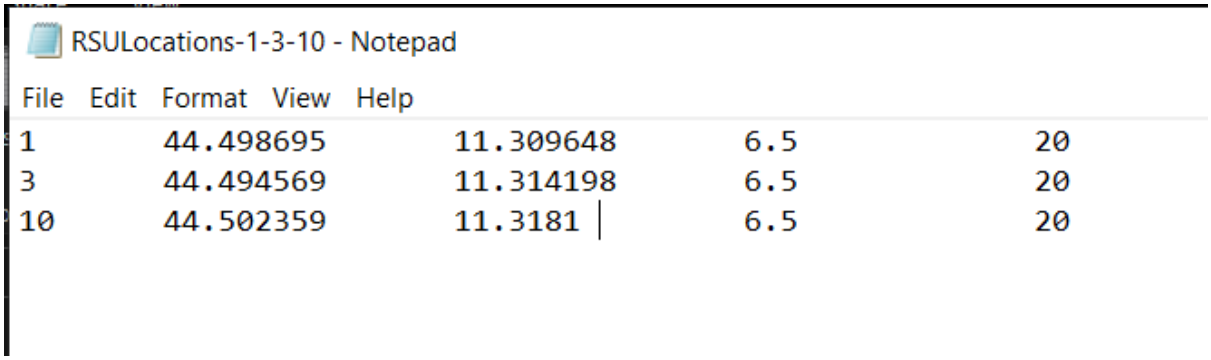
Step 2: Get the co-ordinates of the area from openstreetmap.org and load the same area in the sumo GUI and save the configuration in the form of .sumocfg file.

Step 3: Generate the mobility file (.xml file) from the .sumocfg file using the following the command:

```
C:\Users\HARSH>sumo.exe -c test.sumocfg --fcd-output SUMOMobility.xml --fcd-output.geo true --netstate-dump SUMOMobility.net.xml
```

Also, this xml file contains many time-steps, while GEMV^2 processes files lesser than 10MB, so we have to edit the xml file manually and keep the required number of time-steps. For the current simulation, we have used 50 time-steps.

Step 4: Generate the RSU file by getting the co-ordinates for the RSU from Google Maps.



Step 5: Move the .osm file, the Mobility xml file and the RSU location file to their respective folders in the GEMV^2 directory.

1. GEMV^2 > inputPolygon for .osm file
2. GEMV^2 > inputMobilitySUMO for mobility xml

3. GEMV^2 > inputRSU for the RSU file

Step 6: Edit the code of GEMV^2 > simSettings such that it contains the variables for our input files.

```
case 2
   % Vehicles in the entire city of Porto
    vehiclesFile = 'inputMobilitySUMO/c6rMobility.xml';

    % Buildings in entire city of Porto
    staticFile = 'inputPolygon/c6r.osm';
    RSUFile = 'inputRSU/RSULocations-1-3-10.txt';
    V2XNames = {'V2V', 'V2I'};
case 3
```

Step 7: Edit the simulation parameters in the simSettings, for eg: Vehicle dimension, carrier frequency, fading rate and others mentioned in the first report. For, the results in report, these parameters were not changed as they were for 5G by default.

Step 8: Run the GEMV^2 > runSimulation. These will generate the following results:

1. KML files for the V2V and V2I to visualize on google earth.
2. .csv files containing the RSSI and other information for both V2V and V2I.
3. .mat file containing the same data as csv file but ready to use directly in the matlab in form of matlab data.

They are found in GEMV^2 > outputKML and GEMV^2 > outputSim respectively.

Step 9: Write a simple plotting matlab script to visualize the data obtained in the form of .mat data.

runSimulation.m | simMain.m | simOneTimestep.m | simSettings.m | plotres.m

```
figure
plot(V2XData.V2V.largeScalePwrCell{33, 1})
hold on
plot(V2XData.V2V.largeScalePwrCell{34, 1})
plot(V2XData.V2V.largeScalePwrCell{35, 1})
xlabel('Link number(V2V)')
ylabel('Received power(dB)(Large-Scale model)')
legend('Time-step 33','Time-step 34','Time-step 35')

figure
plot(V2XData.V2I.largeScalePwrCell{33, 1})
hold on
plot(V2XData.V2I.largeScalePwrCell{34, 1})
plot(V2XData.V2I.largeScalePwrCell{35, 1})
xlabel('Link number(V2I)')
ylabel('Received power(dB)(Large-Scale model)')
legend('Time-step 33','Time-step 34','Time-step 35')
```