SUMO Integration

1. Generating Map

   Go to folder where you want to generate the Map file and run the following command
   python3 /usr/share/sumo/tools/osmWebWizard.py

   ```
   student@5GRailWP6:~/MAPforSUMO$ python3 /usr/share/sumo/tools/osmWebWizard.py
   Building scenario in '/home/student/MAPforSUMO/2022-07-13-14-26-13'
   Downloading map data
   200 OK
   Converting map data
   Written configuration to 'osm.netccfg'
   Loading configuration ... done.
   Parsing types from '/usr/share/sumo/data/typemap/osmNetconvert.typ.xml' ... done.
   Parsing nodes from osm-file 'osm_bbox.osm.xml' ... done.
   Parsing edges from osm-file 'osm_bbox.osm.xml' ... done.
   Removing duplicate edges ... done.
   Warning: Discarding unknown compound 'cycleway.track' in type 'cycleway.track|highway.tertiary' (first occurence for edge '3101253').
   Warning: Discarding unusable type 'waterway.river' (first occurence for edge '23883377').
   Warning: Discarding unknown compound 'cycleway.shared_lane' in type 'cycleway.shared_lane|highway.residential' (first occurence for edge '25417691').
   Warning: Discarding unusable type 'waterway.canal' (first occurence for edge '25637137').
   Warning: Discarding unknown compound 'usage.branch' in type 'railway.light_rail|usage.branch' (first occurence for edge '34670067').
   Warning: Discarding unusable type 'railway.platform' (first occurence for edge '121041773').
   Warning: Discarding unknown compound 'cycleway.lane' in type 'cycleway.lane|highway.tertiary' (first occurence for edge '171328774').
   Warning: Discarding unusable type 'route.ferry' (first occurence for edge '240704224').
   Warning: Discarding unusable type 'waterway.stream' (first occurence for edge '262972999').
   Warning: Discarding unknown compound 'cycleway.track' in type 'cycleway.track|highway.residential' (first occurence for edge '403904474').
   Parsing relations from osm-file 'osm_bbox.osm.xml' ... done.
    Removed 5 traffic lights before loading plain-XML
    Import done:
      779 nodes loaded.
      33 types loaded.
      1407 edges loaded.
   Proj projection parameters used: '+proj=utm +zone=33 +ellps=WGS84 +datum=WGS84 +units=m +no_defs'.
   Removing self-loops ... done (0ms).
   Joining junction clusters ...
   Warning: Reducing junction cluster 1301026983,2024780,2027668,2484127698,402612887,6953986825,6953986826,8447283388,8447283395,8811679374,8811679736,8811679738,97
   Warning: Reducing junction cluster 3576199722,3576199733,3576199740,6750108975,6750120293,6750120298,6750120300,6750120310,6750120331,6750120473,6750138592,675013
   Warning: Reducing junction cluster 2027682,402608030,402608032 (parallel incoming -34722847#0,339889572#1).
   Warning: Reducing junction cluster 2086883757,2086883770,653742583 (6 incoming edges).
   Warning: Reducing junction cluster 2086883795,530811646,6749940366 (5 incoming edges).
   done (7ms).
   ```

2. Edit the Vehicle Id i.e Car ID and Train ID

   Go to the folder where map files are generated and look for the files which has the Car, Train and Urban Train ID
   EDIT following Files:- Change the Id with numerical numbers such that ''1'', ''2'' like this, but keep this in mind this number should not be repeated every entity should have a different number.
   File names: - **osm.passenger.trips.xml** --- It contains Car ID
           osm.rail.trips.xml ---- It contains Train ID (Long Route Trains)
           osm.rail_urban.trips.xml---- It contains Urban Train ID

   After that run the following command –open a terminal in the folder where all these files are save and run the command:--

   duarouter --route-files osm.passenger.trips.xml,osm.rail_urban.trips.xml -n osm.net.xml -o secondmap.rou.xml

   Where secondmap.rou.xml is the output file name and it can be any valid file name given by the user.

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26
27 </configuration>
28 -->
29
30 <routes xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="http://sumo.dlr.de/xsd/routes_file.xsd">
31     <vType id="veh_passenger" vClass="passenger"/>
32     <trip id="0" type="veh_passenger" depart="0.00" departLane="best" from="-452310435#4" to="-452310435#0"/>
33     <trip id="1" type="veh_passenger" depart="73.04" departLane="best" departSpeed="max" from="502189305#0" to="-132729217#2"/>
34     <trip id="2" type="veh_passenger" depart="146.08" departLane="best" from="46481908#0" to="-132729217#4"/>
35     <trip id="3" type="veh_passenger" depart="219.12" departLane="best" from="-4292066#2" to="-46481908#0"/>
36     <trip id="4" type="veh_passenger" depart="292.16" departLane="best" from="-132729217#6" to="-452310435#0"/>
37     <trip id="5" type="veh_passenger" depart="365.20" departLane="best" from="452310435#0" to="132729217#2"/>
38     <trip id="6" type="veh_passenger" depart="438.24" departLane="best" from="803164430" to="46481908#0"/>
39     <trip id="7" type="veh_passenger" depart="511.28" departLane="best" departSpeed="max" from="803164402" to="-46481908#1"/>
40     <trip id="8" type="veh_passenger" depart="584.33" departLane="best" from="132729217#2" to="-452310435#0"/>
41     <trip id="9" type="veh_passenger" depart="657.37" departLane="best" from="-132729217#2" to="497426834#2"/>
42     <trip id="11" type="veh_passenger" depart="803.45" departLane="best" from="-452310435#5" to="46481908#0"/>
43     <trip id="12" type="veh_passenger" depart="876.49" departLane="best" from="-4292066#1" to="-46481908#1"/>
44     <trip id="13" type="veh_passenger" depart="949.53" departLane="best" from="803164430" to="46481908#0"/>
45     <trip id="14" type="veh_passenger" depart="1022.57" departLane="best" from="-132729217#8" to="-452310435#0"/>
46     <trip id="15" type="veh_passenger" depart="1095.61" departLane="best" from="-4292066#2" to="-452310435#0"/>
47     <trip id="16" type="veh_passenger" depart="1168.65" departLane="best" from="-452310435#0" to="497426834#2"/>
48     <trip id="18" type="veh_passenger" depart="1314.73" departLane="best" from="132729217#6" to="502189301#3"/>
49     <trip id="19" type="veh_passenger" depart="1387.77" departLane="best" from="132729217#5" to="502189301#3"/>
```

Terminal - student@5GRailWP6: ~/MAPforSUMO/2022-07-13-14-33-37

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```
student@5GRailWP6:~/MAPforSUMO/2022-07-13-14-33-37$ duarouter --route-file osm.passenger.trips.xml,osm.rail_urban.trips.
xml -n osm.net.xml -o secondmap.rou.xml
Error: On processing option '--route-file':
 No option with the name 'route-file' exists.
Error: The parameter 'osm.passenger.trips.xml,osm.rail_urban.trips.xml' is not allowed in this context.
 Switch or parameter name expected.
Error: Could not parse commandline options.
Quitting (on error).
student@5GRailWP6:~/MAPforSUMO/2022-07-13-14-33-37$ duarouter --route-files osm.passenger.trips.xml,osm.rail_urban.trips
.xml -n osm.net.xml -o secondmap.rou.xmlSuccess.up to time step: 3600.00
student@5GRailWP6:~/MAPforSUMO/2022-07-13-14-33-37$
```

3. After generating the map file (secondmap.rou.xml) open the file **osm.sumocfg** and change the following information:

    <input>

        <net-file value="osm.net.xml"/>

        <route-files value="secondmap.rou.xml"/>

        <additional-files value="osm.poly.xml"/>

    </input>

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```xml
<?xml version="1.0" encoding="UTF-8"?>

<!-- generated on 2022-07-13 14:33:42 by Eclipse SUMO sumo Version 1.10.0
-->

<configuration xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="http://sumo.dlr.de/xsd/sumoConfiguration.xsd">

    <input>
        <net-file value="osm.net.xml"/>
        <route-files value="secondmap.rou.xml"/>
        <additional-files value="osm.poly.xml"/>
    </input>

    <processing>
        <ignore-route-errors value="true"/>
    </processing>

    <routing>
        <device.rerouting.adaptation-steps value="18"/>
        <device.rerouting.adaptation-interval value="10"/>
    </routing>

    <report>
        <verbose value="true"/>
        <duration-log.statistics value="true"/>
        <no-step-log value="true"/>
    </report>

    <gui_only>
        <gui-settings-file value="osm.view.xml"/>
    </gui_only>

</configuration>
```

After following these steps move the map files in the **/home/student/mininet-wifi/mn_wifi/sumo/data** folder
And also copy the folder /home/student/mininet-wifi/mn_wifi/sumo here.

4. Now go the folder mininet-wifi and open a terminal and run the following command
        sudo make install

```
Terminal - student@5GRailWP6: ~/mininet-wifi                    —  +  ×

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student@5GRailWP6:~/mininet-wifi$ sudo make install
[sudo] password for student:
install -D mnexec /usr/bin/mnexec
install -D -t /usr/share/man/man1 mn.1 mnexec.1
python setup.py install
running install
running bdist_egg
running egg_info
writing mininet_wifi.egg-info/PKG-INFO
writing dependency_links to mininet_wifi.egg-info/dependency_links.txt
writing requirements to mininet_wifi.egg-info/requires.txt
writing top-level names to mininet_wifi.egg-info/top_level.txt
package init file 'mn_wifi/data/__init__.py' not found (or not a regular file)
package init file 'mn_wifi/examples/eap-tls/__init__.py' not found (or not a reg
ular file)
package init file 'mn_wifi/examples/eap-tls/CA/__init__.py' not found (or not a
regular file)
package init file 'util/__init__.py' not found (or not a regular file)
reading manifest file 'mininet_wifi.egg-info/SOURCES.txt'
writing manifest file 'mininet_wifi.egg-info/SOURCES.txt'
installing library code to build/bdist.linux-x86_64/egg
running install_lib
running build_py
creating build/bdist.linux-x86_64/egg
```