SUMO-Simulator of urban Mobility

SUMO uses dijastra algo for the paths
Sumo is an open source project of the Republic of germany.
Features-
1. Microscopic simulation
2. Online intersection
3. Simulation of multi mode traffic
4.no limit of vehicles
SUMO uses osm maps(open street maps)

Tools with SUMO
NETCONVERT-for reading the road network in different formates and converting them into SUMO formate.
To convert the available gz file into the xml file we use this command-

netconvert --sumo-net-file your_network_file.net.xml.gz --output-file your_output_file.net.xml

Where you_network_file is the input gz file, and the you_output_file is the output file that the netconvert will create.

NETEDIT-a graphical user interface.

There are basically two different pieces of information necessary in order to start a SUMO simulation:
• A Network Topology- roads,railways,water routes etc
• A Traffic Pattern Demand- cars
.net.xml file

```
<edge id=":2121324874_5" function="internal">
    <lane id=":2121324874_5_0" index="0"
     disallow="pedestrian tram rail_urban rail rail_electric rail_fast ship"
     speed="13.89" length="28.60"
      shape="167.97,125.30 173.53,120.72 178.44,115.90 183.04,110.76 187.67,105.20"/>
    <lane id=":2121324874_5_1" index="1"
     disallow="pedestrian tram rail_urban rail rail_electric rail_fast ship"
      speed="13.89" length="28.60"
      shape="169.89,127.86 175.54,123.19 180.63,118.19 185.42,112.87 190.14,107.23"/>
</edge>
```

```
<connection from="-1091249702#0" to="-534588621#2" fromLane="0" toLane="0" via=":3182529377_3_0" dir="r" state="m"/>
<connection from="-1091249702#0" to="534588621#3" fromLane="0" toLane="1" via=":3182529377_4_0" dir="l" state="m"/>
<connection from="-1091249702#0" to="1091249702#0" fromLane="0" toLane="0" via=":3182529377_5_0" dir="t" state="m"/>
<connection from="-1091249702#1" to="-1091249702#0" fromLane="0" toLane="0" via=":9288041063_2_0" dir="s" state="M"/>
<connection from="-1091249702#1" to="1091249702#1" fromLane="0" toLane="0" via=":9288041063_3_0" dir="t" state="m"/>
<connection from="-534588621#2" to="534588621#0" fromLane="1" toLane="1" via=":341340978_0_0" dir="t" state="M"/>
<connection from="-534588621#3" to="1091249702#0" fromLane="0" toLane="0" via=":3182529377_6_0" dir="r" state="M"/>
<connection from="-534588621#3" to="-534588621#2" fromLane="0" toLane="0" via=":3182529377_7_0" dir="s" state="M"/>
<connection from="-534588621#3" to="-534588621#2" fromLane="1" toLane="1" via=":3182529377_7_1" dir="s" state="M"/>
<connection from="1091249702#0" to="1091249702#1" fromLane="0" toLane="0" via=":9288041063_0_0" dir="s" state="M"/>
<connection from="1091249702#0" to="-1091249702#0" fromLane="0" toLane="0" via=":9288041063_1_0" dir="t" state="m"/>
```

JTRROUTER is a routing application which uses flows and turning percentages at junctions as input.

- the network to route the vehicles through,
- the description of the turning ratios for the junctions (defaults may be used for this, too), and
- the descriptions of the flows.

A call may look like this:

```
jtrrouter --flow-files=<FLOW_DEFS> --turn-ratio-files=<TURN_DEFINITIONS>
          --net-file=<SUMO_NET> --output-file=MySUMORoutes.rou.xml
          --begin <UINT> --end <UINT>
```

TraCI- Traffic Control Interface
The interaction with external programs is made by traci.
TraCI uses TCP based client/server architecture to provide access to SUMO.