

Project: Car Operation Parser

- Process
 - Step 1: Create a [Context-Free Grammar](#), including [Production Rules](#), for [car](#) operations.

When driving the car, door should be closed, the window can be up or down, brake should be off, throttle can be pump or release and the transmission should be 1 or 2 or 3 or 4.

Non-terminal:

Drive

Door

Window

Brake

Throttle

Transmission

Terminal:

Open / Close

Up / Down

On / Off

Pump / Release

0 / 1 / 2 / 3 / 4

Start Symbol:

Drive

Production Rule:

Drive --> Close + Window + Brake+ Throttle + Transmission

Window --> Up | Down

Brake --> On | Off

Throttle --> Pump | Release

Transmission --> 1 | 2 | 3 | 4

Revised Simple Production Rule:

Based on:

- Open Down Off Pump 1
- Open Up Off Pump 1

Drive --> Open + Window + Off+ Pump + 1

Door = Open | Close

Window = Up | Down

Brake = On | Off

Throttle= Pump | Release

Transmission = 0 | 1 | 2 | 3 | 4

Revised Production Rule: (General Try)

Drive = Open Window Off Pump 1 (Start engine, drive)

Drive = Drive + Close (Door remain closed after start driving)

Drive = Drive + Window (Window can be up or down during driving)

Drive = Drive + Brake (Brake can be on or off during moving)

Drive = Drive + Throttle (Throttle can be pump and release while driving)

Drive = Drive + Release On Transmission (Change Transmission)

Door = Open | Close

Window = Up | Down

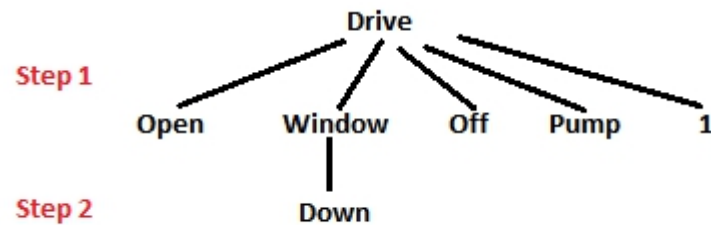
Brake = On | Off

Throttle = Pump | Release

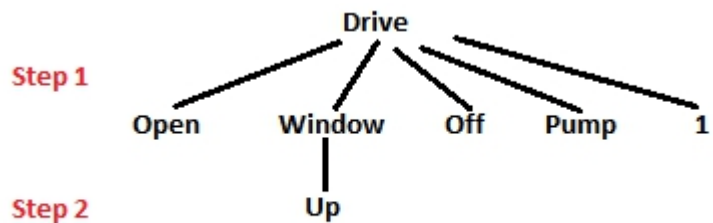
Transmission = 0 | 1 | 2 | 3 | 4

Top Down Parser Tree

Open Down Off Pump 1



Open Up Off Pump 1



Shift Reduce Parsing (i.e., Bottom-Up) Parse tree

Open Down Off Pump 1

Stack	Input String	Action
\$	Open Down Off Pump 1\$	Shift Open
\$Open	Down Off Pump 1\$	Shift Down
\$Open Down	Off Pump 1\$	Reduce by Window = Up Down
\$Open Window	Off Pump 1\$	Shift Off
\$Open Window Off	Pump 1\$	Shift Pump
\$Open Window Off Pump	1\$	Shift 1
\$Open Window Off Pump 1	\$	Reduce by Drive = Open Window Off Pump 1
\$Drive	\$	Accepted

Open Up Off Pump 1

Stack	Input String	Action
\$	Open Up Off Pump 1\$	Shift Open
\$Open	Up Off Pump 1\$	Shift Up
\$Open Up	Off Pump 1\$	Reduce by Window = Up Down
\$Open Window	Off Pump 1\$	Shift Off
\$Open Window Off	Pump 1\$	Shift Pump
\$Open Window Off Pump	1\$	Shift 1
\$Open Window Off Pump 1	\$	Reduce by Drive = Open Window Off Pump 1
\$Drive	\$	Accepted