Assignment 1:Abstract Syntax Tree Analysis

The Assignment was about making a tool which will use ast2json to convert or translate a Python program to a json structure.Then using that json AST we have to print the all the Assignment Statements ,Branch Conditions and the Loop Conditions in the program.

To accomplish this I used the ast2json package and ast package which has parse method to convert the python code to an Abstract Syntax Tree then I applied kind of a modified version of DFS Traversal on the json(Dictionary) structure to traverse the whole tree and print the required outputs.

Challenges:

The Biggest hurdle for this task was the problem of understanding the python AST since from the official python site i.e https://docs.python.org/3/library/ast.html there is a lot of well defined written information but no where an example structure of the AST is given.Finally I got to know about a tool which when given a json file draws the Tree out of it https://vanya.jp.net/vtree/ .Once you able to visualize the tree then it gets really fun to proceed and this can be done by referring the https://docs.python.org/3/library/ast.html which has sufficient information regarding the python grammar and how the AST is made what are all rules etc.

Things to be taken care while using the tool:

1. To run this we need to be in **ubuntu 20** environment because I have used the command “python3 Assignments.py“ in the run.sh file, the **ast2json** must be installed in your system to run this code.
2. While running the run.sh file we need the source code file i.e “ Assignments.py “ to be in the same folder as run.sh.
3. While entering the python filename as input make sure the file is present in the same directory or folder else write the exact File location name.

Steps to run:

1. In the terminal go to the directory where **run.sh** and **Assignments.py** is present.
2. To start run the run.sh file use the command **./run.sh**
3. Enter the Filename (the python File you want to give as input) if the file is present in the same folder else write the complete location with the filename Example- /mnt/d/assignment_1_21111032/Testcases/Test0.py
4. The Output will be displayed in the terminal.

Note: I have kept the run.sh(shell) file both in the source folder and outside it too please don’t get confused both are same files just to be sure that you keep the run.sh and assignment.py file both

in same folder while running I kept it inside source folder too.And incase run.sh does’nt work well you can directly run the Assignments.py using your python compiler easily and it will run well.