

Lessons Learned:

This was my first time writing a full-fledged python program, so it was a bit difficult to complete everything mentioned in the requirement.

I now have very good understanding of basic Python functionality such as loops, functions, type conversions, sets, lists, dictionaries.

Using JSON files as input to the program helped me understand the encoding and decoding of JSON files in Python.

Issues Faced (but resolved):

Importing JSON data from a JSON file

Using dictionary to store transition function values obtained from JSON file

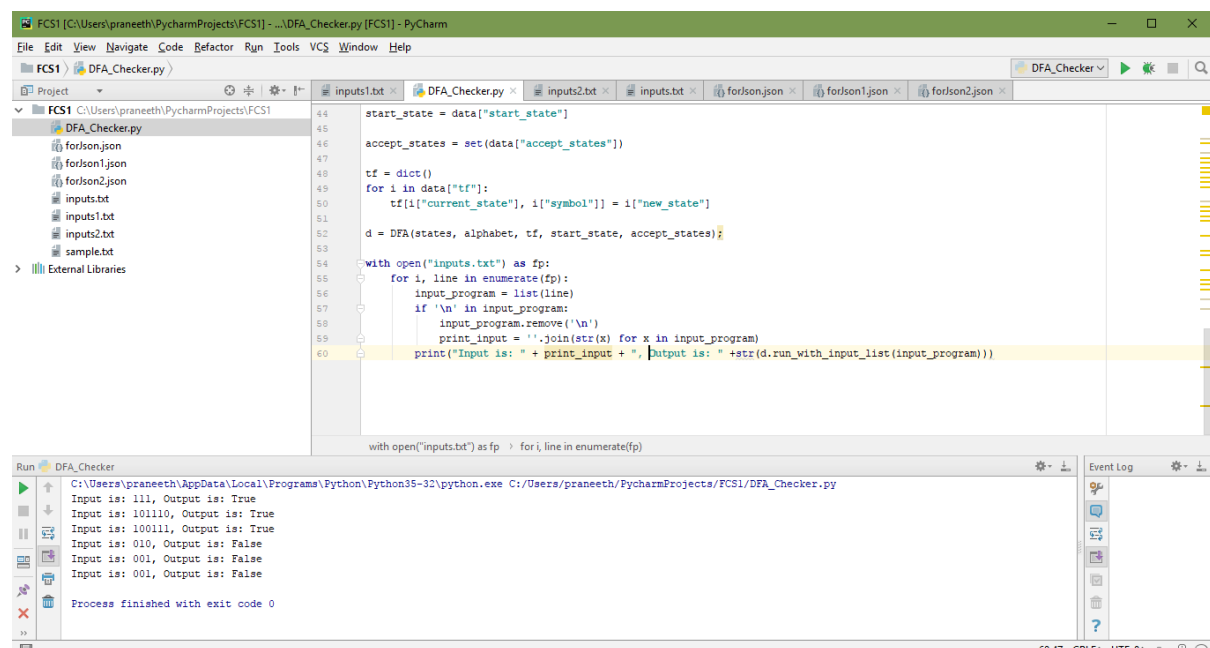
Reading a sequence of digits from a line and storing them in a list, line by line

Joining elements in the list again to form a string while printing Output

Traversing from one function to another based on states and inputs

Outputs:-

For 1.6b:



The screenshot displays the PyCharm IDE with a project named 'FCS1'. The main editor window shows the 'DFA_Checker.py' file. The code defines a DFA with states, an alphabet, a transition function, a start state, and accept states. It reads input from 'inputs.txt', processes it, and prints the output. The output window at the bottom shows the results of the program's execution for various inputs.

```
44 start_state = data["start_state"]
45
46 accept_states = set(data["accept_states"])
47
48 tf = dict()
49 for i in data["tf"]:
50     tf[i["current_state"], i["symbol"]] = i["new_state"]
51
52 d = DFA(states, alphabet, tf, start_state, accept_states)
53
54 with open("inputs.txt") as fp:
55     for i, line in enumerate(fp):
56         input_program = list(line)
57         if '\n' in input_program:
58             input_program.remove('\n')
59             print_input = ''.join(str(x) for x in input_program)
60             print("Input is: " + print_input + ", Output is: " + str(d.run_with_input_list(input_program)))
```

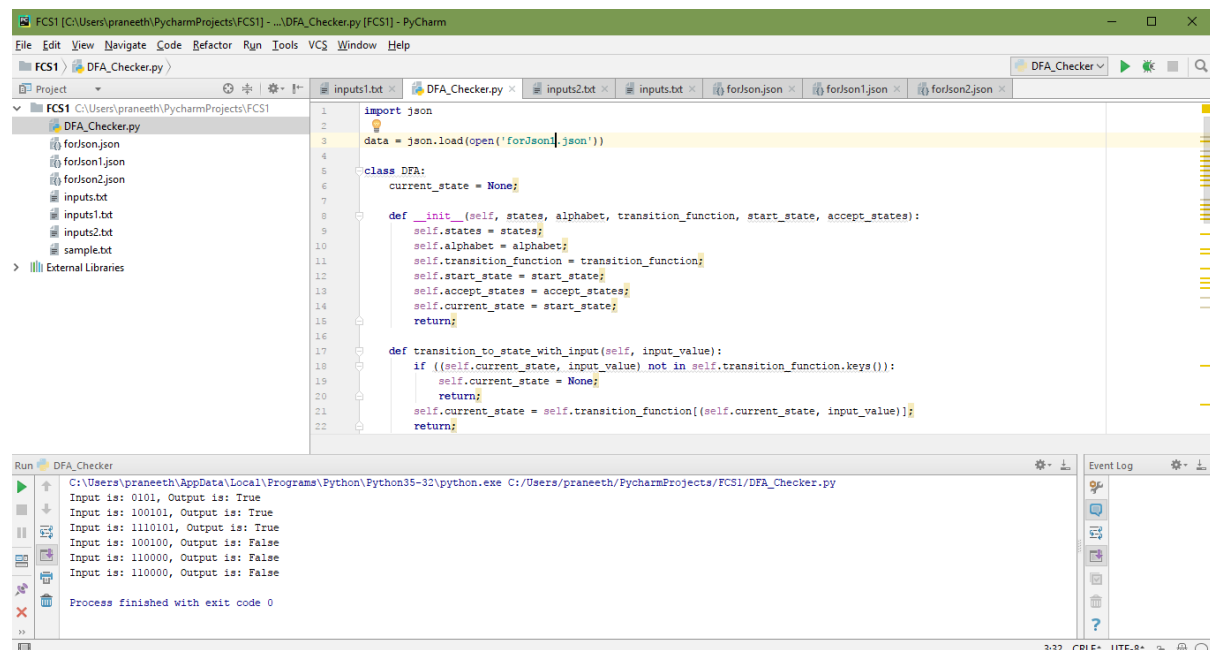
Run: DFA_Checker

C:\Users\praneeth\AppData\Local\Programs\Python\Python35-32\python.exe C:/Users/praneeth/PycharmProjects/FCS1/DFA_Checker.py

Input is: 111, Output is: True
Input is: 101110, Output is: True
Input is: 100111, Output is: True
Input is: 010, Output is: False
Input is: 001, Output is: False
Input is: 001, Output is: False

Process finished with exit code 0

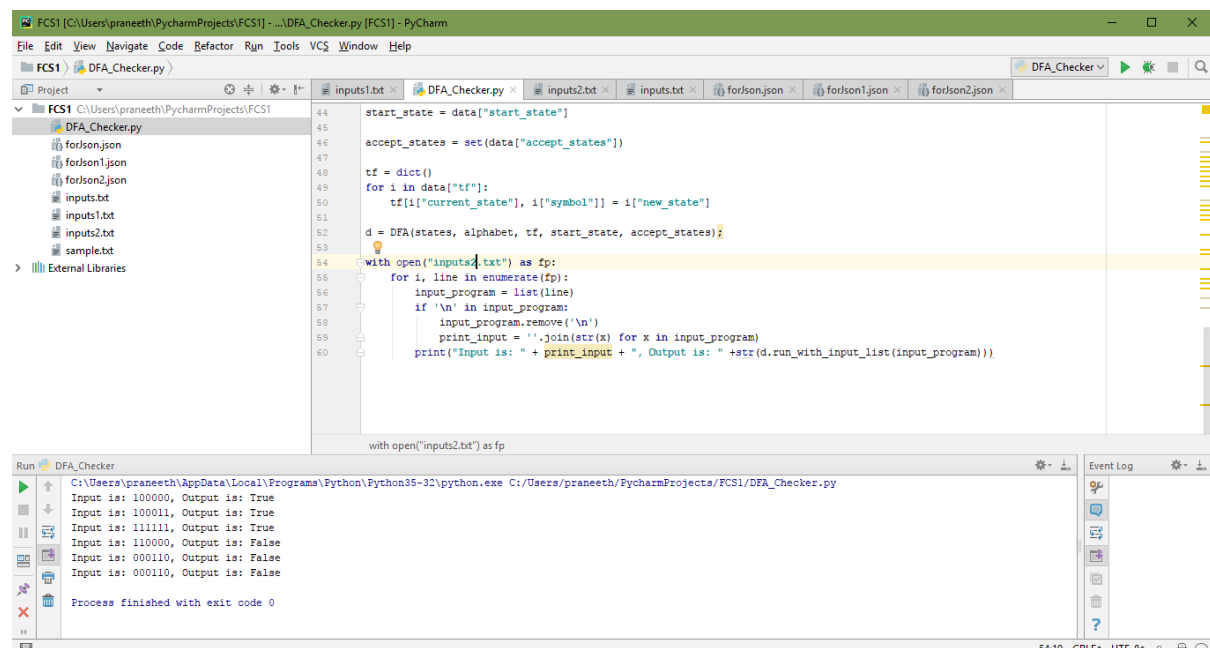
For 1.6c:



The screenshot shows the PyCharm IDE with the file `DFA_Checker.py` open. The code defines a `DFA` class that takes states, alphabet, transition function, start state, and accept states as input. It implements an `__init__` method to initialize these attributes and a `transition_to_state_with_input` method to process an input string. The `run` method is not yet implemented. The Run window shows the following output:

```
Input is: 0101, Output is: True
Input is: 100101, Output is: True
Input is: 1110101, Output is: True
Input is: 100100, Output is: False
Input is: 110000, Output is: False
Input is: 110000, Output is: False
Process finished with exit code 0
```

For 1.6f:



The screenshot shows the PyCharm IDE with the file `DFA_Checker.py` open. The code is now complete, including the `run` method which reads input from `inputs.txt` and processes each line. The Run window shows the following output:

```
Input is: 100000, Output is: True
Input is: 100011, Output is: True
Input is: 111111, Output is: True
Input is: 110000, Output is: False
Input is: 000110, Output is: False
Input is: 000110, Output is: False
Process finished with exit code 0
```