Automata Formal Language and Logic
Assignment 1
30 Oct 2021

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Simulate a DFA of minimum 5 states in a language of our choice
L={every 'a' followed by a 'bb'} for w={a,b}

CODE:

```
import automata
def start(c):
    if (c == 'b'):
        dfa = 0
    elif (c =='a'):
        dfa = 2
    else:
        dfa = -1
    return dfa

def state1(c):
    if (c == 'a'):
        dfa = 4
    elif (c == 'b'):
        dfa = 2
    else:
        dfa = -1
    return dfa

def state2(c):
    if (c == 'a'):
        dfa = 4
    elif (c == 'b'):
        dfa = 3
    else:
        dfa = -1
    return dfa

def state3(c):
    if (c == 'a'):
        dfa = 1
    elif (c == 'b'):
        dfa = 3
    else:
        dfa = -1
    return dfa
```

```python
def state4(c):
    if (c == 'a'):
        dfa = 4
    elif (c == 'b'):
        dfa = 4
    else:
        dfa = -1
    return dfa

def isAccepted(String):
    l=len(String)
    dfa = 0
    for i in range(l):
        if (dfa == 0):
            dfa = start(String[i])
        elif (dfa ==1):
            dfa = state1(String[i])
        elif (dfa ==2):
            dfa = state2(String[i])
        elif (dfa ==3):
            dfa = state3(String[i])
        elif (dfa ==4):
            dfa = state4(String[i])
        else:
            return 0
    if(dfa == 0 or dfa == 3):
        return 1
    else:
        return 0
```
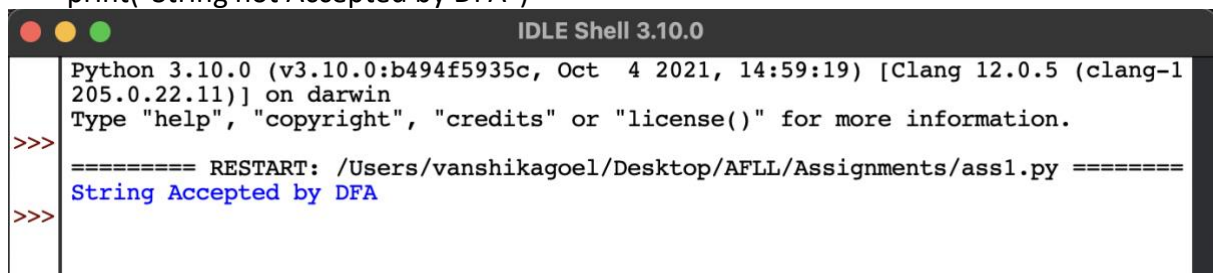
Driver Code:

1) **Accepted**

```python
if __name__ == "__main__":
    String = "abbabb"
    if (isAccepted(String)):
        print("String Accepted by DFA")
    else:
        print("String not Accepted by DFA")
```



```
●  ●  ●                        IDLE Shell 3.10.0
     Python 3.10.0 (v3.10.0:b494f5935c, Oct  4 2021, 14:59:19) [Clang 12.0.5 (clang-1
     205.0.22.11)] on darwin
     Type "help", "copyright", "credits" or "license()" for more information.
>>>
     ========= RESTART: /Users/vanshikagoel/Desktop/AFLL/Assignments/ass1.py ========
     String Accepted by DFA
>>>
```
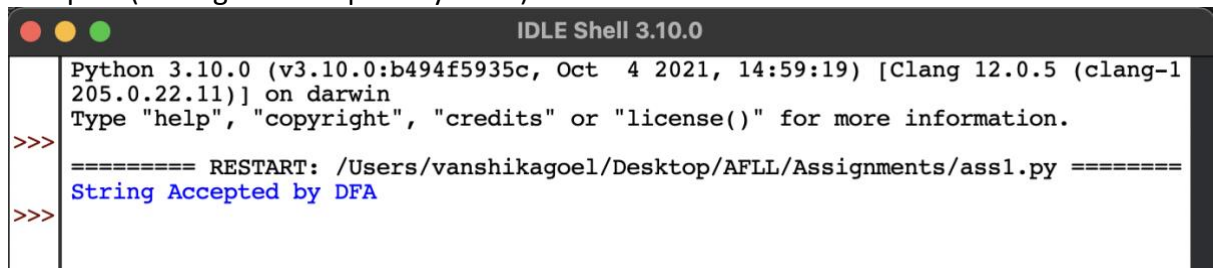
```
if __name__ == "__main__":
    String = "b"
    if (isAccepted(String)):
        print("String Accepted by DFA")
    else:
        print("String not Accepted by DFA")
```

```
● ● ●                        IDLE Shell 3.10.0
    Python 3.10.0 (v3.10.0:b494f5935c, Oct  4 2021, 14:59:19) [Clang 12.0.5 (clang-1
    205.0.22.11)] on darwin
    Type "help", "copyright", "credits" or "license()" for more information.
>>>
    ========= RESTART: /Users/vanshikagoel/Desktop/AFLL/Assignments/ass1.py ========
    String Accepted by DFA
>>>
```
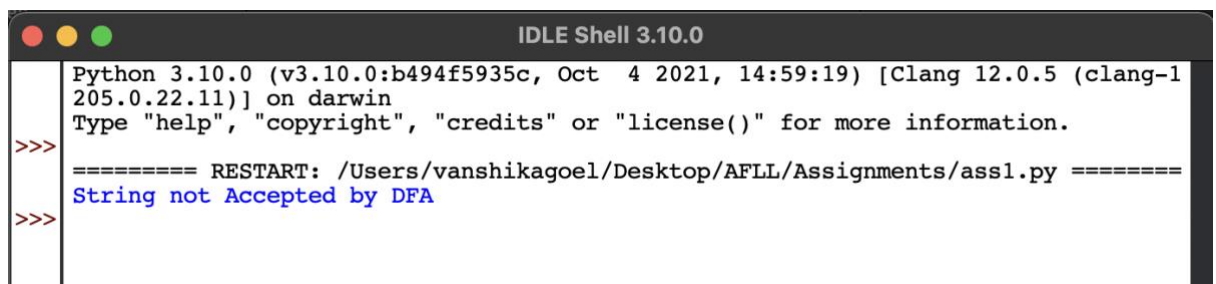
2) Not Accepted

```
if __name__ == "__main__":
    String = "abbabbab"
    if (isAccepted(String)):
        print("String Accepted by DFA")
    else:
        print("String not Accepted by DFA")
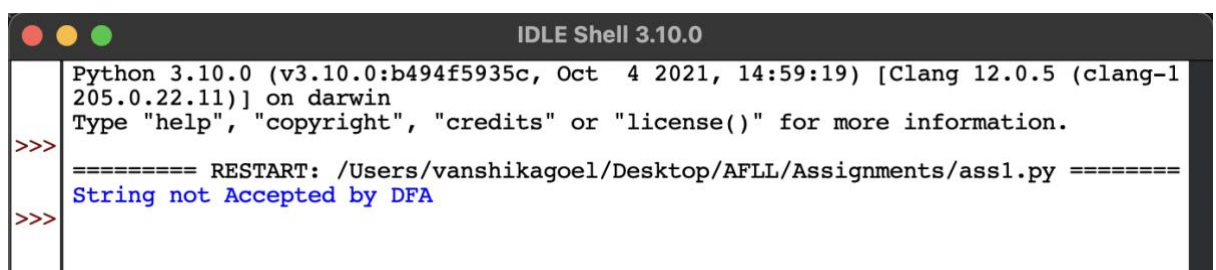```

```
● ● ●                        IDLE Shell 3.10.0
    Python 3.10.0 (v3.10.0:b494f5935c, Oct  4 2021, 14:59:19) [Clang 12.0.5 (clang-1
    205.0.22.11)] on darwin
    Type "help", "copyright", "credits" or "license()" for more information.
>>>
    ========= RESTART: /Users/vanshikagoel/Desktop/AFLL/Assignments/ass1.py ========
    String not Accepted by DFA
>>>
```

```
if __name__ == "__main__":
    String = "abbbab"
    if (isAccepted(String)):
        print("String Accepted by DFA")
    else:
        print("String not Accepted by DFA")
```

```
● ● ●                        IDLE Shell 3.10.0
    Python 3.10.0 (v3.10.0:b494f5935c, Oct  4 2021, 14:59:19) [Clang 12.0.5 (clang-1
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    Type "help", "copyright", "credits" or "license()" for more information.
>>>
    ========= RESTART: /Users/vanshikagoel/Desktop/AFLL/Assignments/ass1.py ========
    String not Accepted by DFA
>>>
```