ACD Lab ASSIGNMENT 2

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Section : CSE A

Roll no : 5

1 . Write a program to design a PDA to check any string over a,b where (a^n b^n ; n>0), also show all transitions in output.

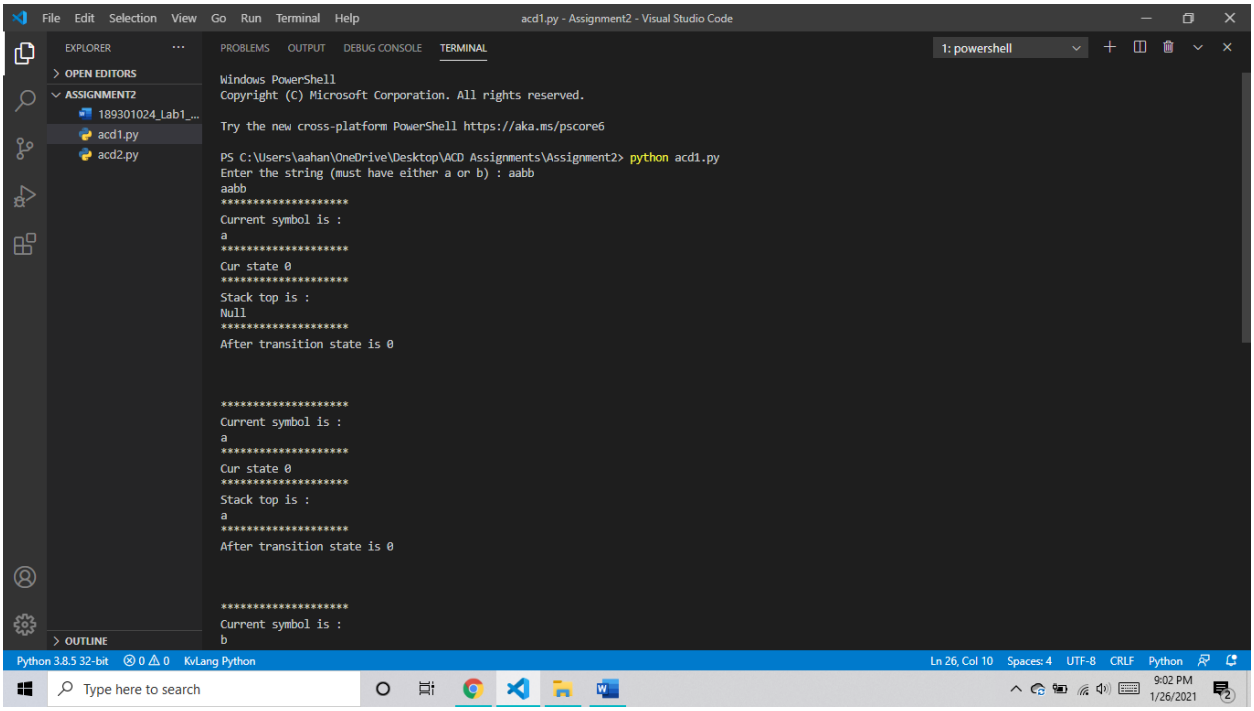
Sol :

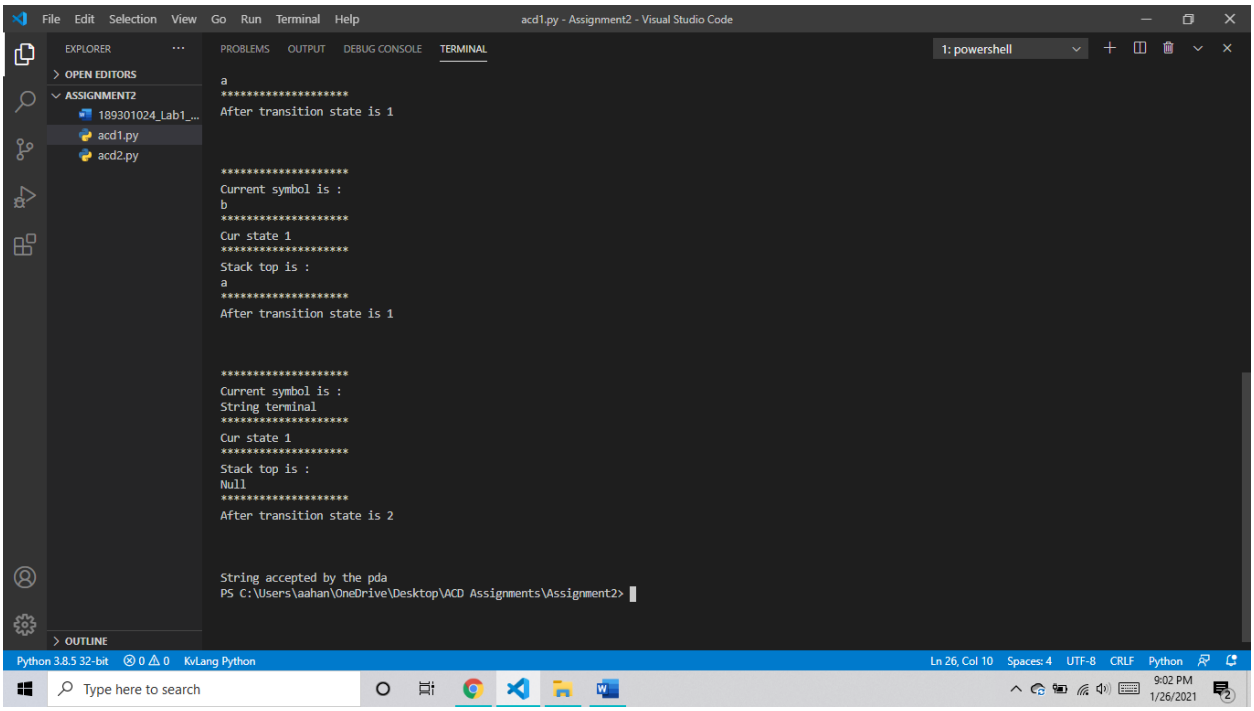
Code : (python)

```
#question for cfg for a^nb^n
stack=['\0']
#the transition functions for the pda
#transitions are like this curstate:('input symbol','stack top','operation','tran
sition to which state')
transitions={
    0:[('a','\0','push',0),('a','a','push',0),('b','\0','none',3),('b','a','pop',
1)],
    1:[('a','\0','none',3),('a','a','none',3),('b','a','pop',1),('\0','\0','none'
,2),('b','\0','none',3)],
}
pattern=''.center(20,'*')
curState=0
def alterStack(operation,char):
    global stack
    if operation=='push':
        stack.append(char)
    elif operation=='pop':
        stack.pop()
    else:
        pass

def makeTransition(char):
    global curState
    print(pattern)
    print('Current symbol is :')
    if char!='\0':
        print(char)
    else:
```

```
        print('String terminal')
    print(pattern)
    print('Cur state {}'.format(curState))
    print(pattern)
    stackTop=stack.pop()
    print('Stack top is :')
    if stackTop!='\0':
        print(stackTop)

    else:
        print('Null')
    print(pattern)

    stack.append(stackTop)
    if curState==3:
        return
    elif curState<2:
        for tup in transitions[curState]:
            if tup[0]==char and tup[1]==stackTop:
                alterStack(tup[2],char)
                curState=tup[3]
                break
    elif curState==2 and char !='\0':
        curState=3
    print('After transition state is {}'.format(curState))
    print('\n\n')
testString=input('Enter the string (must have either a or b) : ')
testString+='\0'
print(testString)
for char in testString:
    if char in ['a','b','\0']:
        makeTransition(char)
    else:
        print('Sorry unwanted symbol inside the input string')
        break
if curState==2:
    print('String accepted by the pda')
else:
    print('String not accepted')
```

Ouput:





2. Write a program to design a PDA to check any string for even size palindrome. also show all transitions in output.

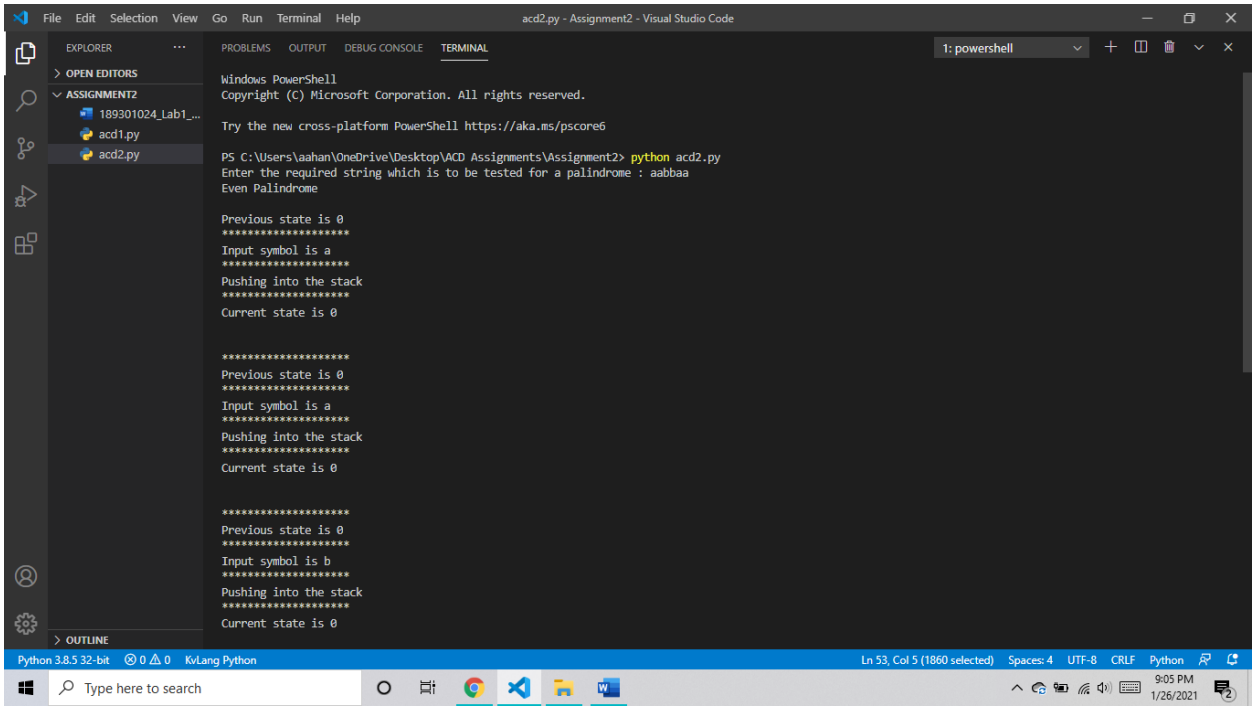
Sol:

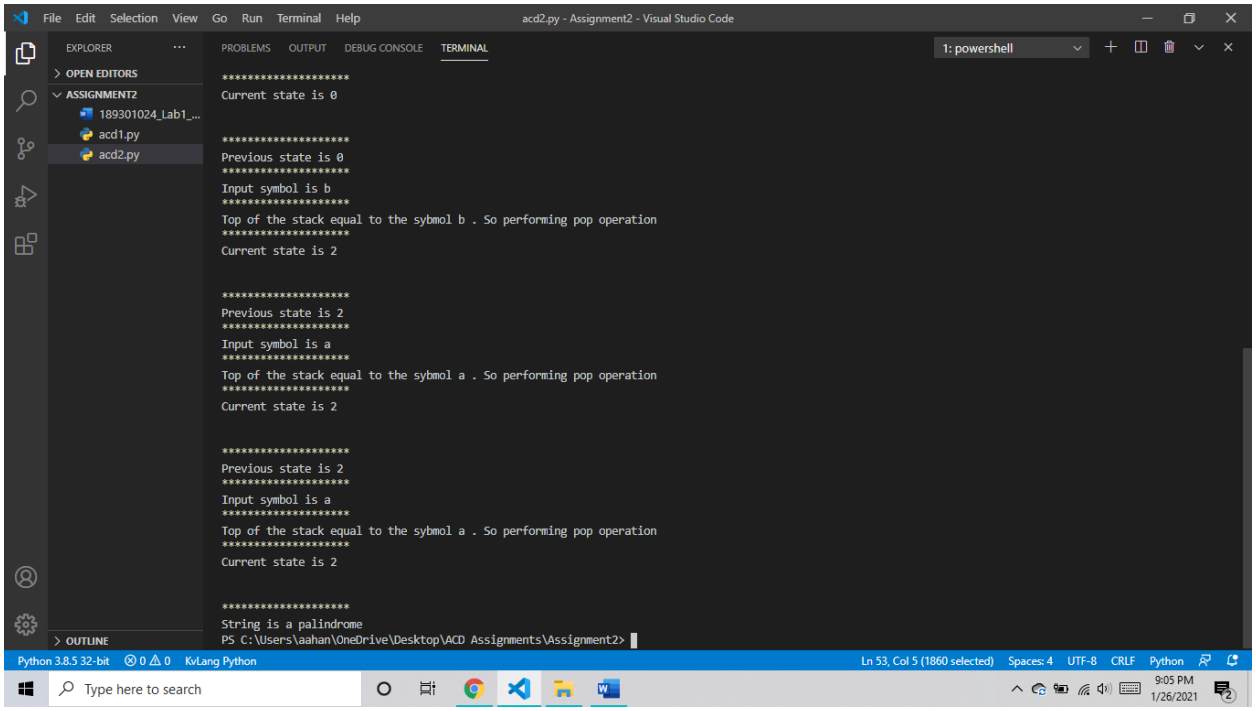
Code in python:

```
import math
#question for cfg for a^nb^n
stack=['\0']
#the transition functions for the pda
#transitions are like this curstate:('input symbol','stack top','operation','tran
sition to which state')
currentState=0
pattern=''.center(20,'*')
def automatize(string):
    global currentState
    for index,char in enumerate(string):
        prevState=currentState
        print('Previous state is {}'.format(prevState))
        print(pattern)
        print('Input symbol is {}'.format(char))
        print(pattern)
        if char in ['a','b']:
            if index+1<=len(string)//2:
                print('Pushing into the stack')
                print(pattern)
                stack.append(char)
            else:
                lastEle=stack.pop()
                if char==lastEle:
                    print('Top of the stack equal to the sybmol {} . So performin
g pop operation'.format(char))
                    print(pattern)
                    currentState=2

                else:
                    print('Top of the stack not  equal to the sybmol {} . So quit
ting'.format(char))
                    print(pattern)
                    currentState=3
                    break
        else:
            print('Invalid symbols in the string')
            break
        print('Current state is {}\n\n'.format(currentState))
        print(pattern)
    if currentState==2:
        print('String is a palindrome')
    else:
        print('String is not a palindrome')
```

```
string=input('Enter the required string which is to be tested for a palindrome :
')
if(len(string)%2==0):
    print('Even Palindrome\n')
    automatize(string)

else:
    print('Odd palindrome\n')
    newstring=string[:math.floor(len(string)/2)]+string[math.floor(len(string)/2)
+1:]
    automatize(newstring)
```

Ouput:




File Edit Selection View Go Run Terminal Help
acd2.py - Assignment2 - Visual Studio Code
EXPLORER
OPEN EDITORS
ASSIGNMENT2
189301024_Lab1_...
acd1.py
acd2.py
OUTLINE
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
1: powershell
****
Current state is 0
****
Previous state is 0
****
Input symbol is b
****
Top of the stack equal to the sybmol b . So performing pop operation
****
Current state is 2
****
Previous state is 2
****
Input symbol is a
****
Top of the stack equal to the sybmol a . So performing pop operation
****
Current state is 2
****
Previous state is 2
****
Input symbol is a
****
Top of the stack equal to the sybmol a . So performing pop operation
****
Current state is 2
****
String is a palindrome
PS C:\Users\aahan\OneDrive\Desktop\ACD Assignments\Assignment2>
Python 3.8.5 32-bit
0 0
KvLang Python
Ln 53, Col 5 (1860 selected)
Spaces: 4
UTF-8
CRLF
Python
Type here to search
9:05 PM
1/26/2021