

**VIT[®]****Vellore Institute of Technology**
(Deemed to be University under section 3 of UGC Act, 1956)

Experiment 7: Palindrome Check

Programme	:	BTech. CSE Core	Semester	:	Win 2021-22
Course	:	Microprocessor and Interfacing	Code	:	CSE2006
Faculty	:	Dr. Florence Gnana Poovathy J	Slot	:	L15+L16
Name	:	Hariket Sukesh Kumar Sheth	Register No.	:	20BCE1975

Date: 16-03-2022

Exp. 07

Palindrome Check



Palindrome Check

Aim: To check whether the given string is a palindrome or not

Tool Used: Assembler – MASM611

Algorithm:

Step 1: First of all, mount the c drive using the command: **mount c c:\masm611\bin**

Step 2: After pressing **enter**, type **c:** and press enter.

Step 3: Now give a command, **<filename>.asm** for writing/editing the code and the write the code.

Step 4: A pop window appears; there we have to write out code(instructions) following the logic given below.

1. In the data section, declare three strings to display input and output.
2. Start the code segment by loading its effective address and using an interrupt to display the input "Enter the string: " string.
3. Using interrupt, read the input string from the loop L1.
4. If BX value is not equal to zero, go to check loop L2. Store 0 in DI and decrement BX in loop L2.
5. If BX value is not equal to zero, move to check loop L2. Store 0 in DI and decrease BX in loop L2.
6. Compare the ith and (n-i)th elements of the string in the check loop. If the items are not equal, the loop will fail. If the elements are same, proceed to step 8.
7. End the programme by printing the message "The string is not a palindrome" in the fail loop.
8. Continue traversing the string by incrementing BX until BX equals 0; if all elements are equal and the programme never enters the fail loop, display "string is a palindrome" and exit the programme.

Step 5: Now give a command, **masm <filename>.asm** for running the code. The object file is created.

Step 6: Now give a command, **link <filename>.obj** to link the object file to library file present in the bin folder.

Step 7: Press **ENTER** four times.

Step 8: Write **<filename>.exe**

PROGRAM:

```
PAL.ASM
DATA SEGMENT
    STR DB 'Enter the String: $'
    MSG1 DB 10,13, 'String is Palindrome$'
    MSG2 DB 10,13, 'String is not Palindrome$'
    INST DB 20 DUP(0)
DATA ENDS
CODE SEGMENT
ASSUME CS: CODE, DS:DATA
START:

    MOV AX, DATA
    MOV DS, AX
    LEA DX, STR
    MOV AH,09H
    INT 21H

    MOV BX, 00
UP:
    MOV AH, 01H
    INT 21H
    CMP AL, 0DH

    JE DOWN
    MOV [INST+BX], AL
    INC BX
    LOOP UP

DOWN:
    MOV DI, 0
    DEC BX
    JNZ CHECK

CHECK:
    MOV AL, [INST+BX]
    CMP AL, [INST+DI]
    JNE FAIL

    INC DI
    DEC BX
    JNZ CHECK

    LEA DX, MSG1
    MOV AH, 09H

    INT 21H
    JMP FINISH

FAIL:
    LEA DX, MSG2
    MOV AH, 09H
    INT 21H

FINISH:
    MOV AH, 4CH
    INT 21H

HLT
CODE ENDS
END START
```

Sample Input	Sample Output
- HARIKET	- String is not Palindrome
- NITIN	- String is Palindrome
- MALAYALAM	- String is Palindrome

Register / Memory Contents for I/O

C:\>debug pal.exe

-u

```

076A:0000 B86407      MOV     AX,0764
076A:0003 8ED8          MOV     DS,AX
076A:0005 8D160000      LEA     DX,[0000]
076A:0009 B409          MOV     AH,09
076A:000B CD21          INT     21
076A:000D BB0000      MOV     BX,0000
076A:0010 B401          MOV     AH,01
076A:0012 CD21          INT     21
076A:0014 3C0D          CMP     AL,0D
076A:0016 7407          JZ      001F
076A:0018 88874500      MOV     [BX+0045],AL
076A:001C 43            INC     BX
076A:001D E2F1          LOOP   0010
076A:001F BF0000      MOV     DI,0000

```

-u

```

076A:0022 4B            DEC     BX
076A:0023 7500          JNZ     0025
076A:0025 8A874500      MOV     AL,[BX+0045]
076A:0029 3A854500      CMP     AL,[DI+0045]
076A:002D 750E          JNZ     003D
076A:002F 47            INC     DI
076A:0030 4B            DEC     BX
076A:0031 75F2          JNZ     0025
076A:0033 8D161300      LEA     DX,[0013]
076A:0037 B409          MOV     AH,09
076A:0039 CD21          INT     21
076A:003B EB08          JMP     0045
076A:003D 8D162A00      LEA     DX,[002A]
076A:0041 B409          MOV     AH,09

```

-u

```

076A:0043 CD21          INT     21
076A:0045 B44C          MOV     AH,4C
076A:0047 CD21          INT     21
076A:0049 F4            HLT
076A:004A 0000          ADD     [BX+SI],AL
076A:004C 1F            POP     DS
076A:004D 1D9821      SBB     AX,2198
076A:0050 0004          ADD     [SI],AL
076A:0052 8C21          MOV     [BX+DI],ES
076A:0054 F0            LOCK
076A:0055 43            INC     BX
076A:0056 0422          ADD     AL,22
076A:0058 6E            DB      6E
076A:0059 3804          CMP     [SI],AL
076A:005B FA            CLI
076A:005C 045C          ADD     AL,5C
076A:005E 43            INC     BX
076A:005F AF          SCASW
076A:0060 21E7          AND     DI,SP
076A:0062 0404          ADD     AL,04

```

Output:

```
-g 076A:0049
Enter the String: HARIKET

String is not Palindrome
Program terminated normally
-g 076A:0049
Enter the String: NITIN

String is Palindrome
```

```
C:\>debug pal.exe
-g 076A:0049
Enter the String: MALAYALAM

String is Palindrome
Program terminated normally
-g 076A:0049
Enter the String: PMODASGHGSADOMP

String is Palindrome
```

```
C:\>debug pal.exe
-g 0764:0049
Enter the String: DAYSCHOLAR HOSTELLER

String is not Palindrome
Program terminated normally
-g 0764:0049
Enter the String: ANUPUNA

String is Palindrome
C:\>_
```