St. Francis Institute of Technology

Class: SE-ITA/ITB Semester: IV; A.Y. 2023-2024
Subject: Microprocessor Lab

Experiment – 9: Check if given string is a palindrome or not

1. Aim:

Write an ALP to check if the given string is palindrome or not.

2. Requirements

DOSBox (an x86 emulator with DOS), Turbo Assembler, Turbo Debugger

3. Pre-Experiment Exercise

Algorithm:

a. Initialize the data segment with messages to take string input, display if the string is palindrome or not.

b. Write the macro for displaying message on the output screen.

c. Initialize the code segment. Use macro to display the message "Enter the string:$" d. Wait for input from the user and scan the string using INT 21H. While scanning, the assembler first stores the length of the buffer, next the length of the actual string followed by message. e. Use block transfer concepts to duplicate the string using SI and DI registers. f. Begin comparison between first and last of the string and check if they match or no. g. If they match, repeat for remaining part of the string. If all match, display message "String is palindrome$".

h. If they don't match, display message "String is not palindrome$"

4. Laboratory Exercise:

Procedure:

a. Open DOSbox and go to TASM.

b. Open a new document using the command - edit <filename>.asm

c. Write the Program and save the changes to the same file.

d. Assemble the program using the command - tasm <filename.asm>

e. If any errors are displayed, then change the code in <filename>

f. If no errors are displayed, execute the command - tlink <filename>.obj

g. Next execute the command - <filename>

5. Post Experiment Exercise:

a. **Results/Calculations/Observations:**

Along with ALP, attach at least one screenshot of display showing whether the entered string is palindrome or not.

b. **Questions:**

i. What is a procedure? Explain types of procedures in 8086.

ii. Differentiate between macro and procedure.

c. **Conclusion:**

Write the conclusion/comments based on the experiment performed and the output obtained. d. **References:**

Mention two book references and two web references.

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MPL EXPERIMENT 9

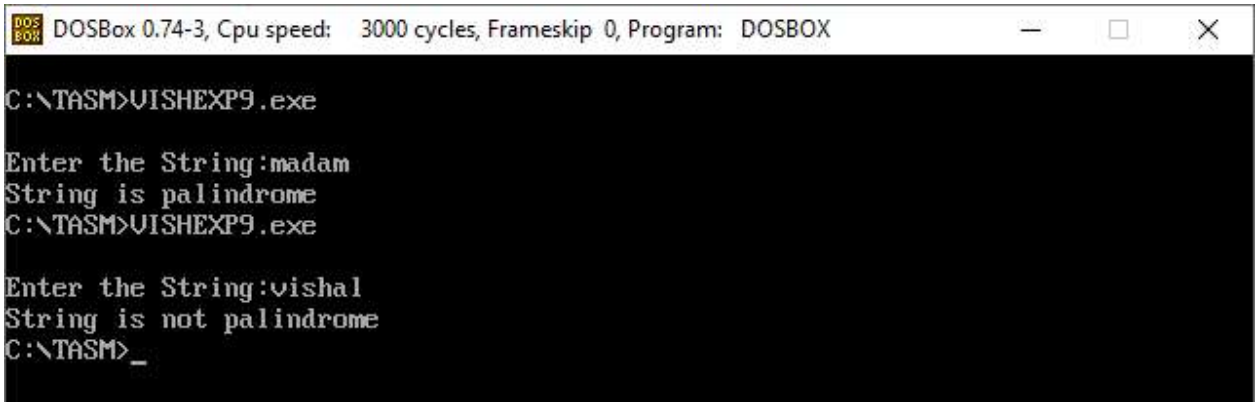
Write an ALP to check if the given string is palindrome or not.

CODE:

```
model small
stack 10h
data segment
	len dB 00h
	msg0 dB 10,13,"Enter the String:$"
	msg1 dB 0fh dup('?')
	msg2 dB 0fh dup('?')
	msg3 dB 10,13,"String is palindrome$"
	msg4 dB 10,13,"String is not palindrome$"
data ends
disp macro msg
	mov ah,09h
	lea dx,msg
	int 21h
endm
code segment
	assume cs:code , ds:data
	start:
		mov ax,data
		mov ds,ax
		disp msg0
		lea dx,msg1
		mov ah,0ah
		int 21h
		mov cl,[msg1+1]
		mov len,cl
		lea si,[msg1+2]
		lea di,[msg2+2]
	reverse:
```

```
        mov al,[si]
        mov [di],al
        inc si
        inc di
        dec cl
        jnz reverse
        lea si,[msg1+2]
        dec di
        mov cl,len
        mov ch,00h
    up:
        mov al,[si]
        cmp al,[di]
        jne notpalin
        inc si
        dec di
        loop up
        disp msg3
        jmp exit
notpalin: disp msg4
   exit: mov ah,4ch
        int 21h
code ends
end start
```

OUTPUT:



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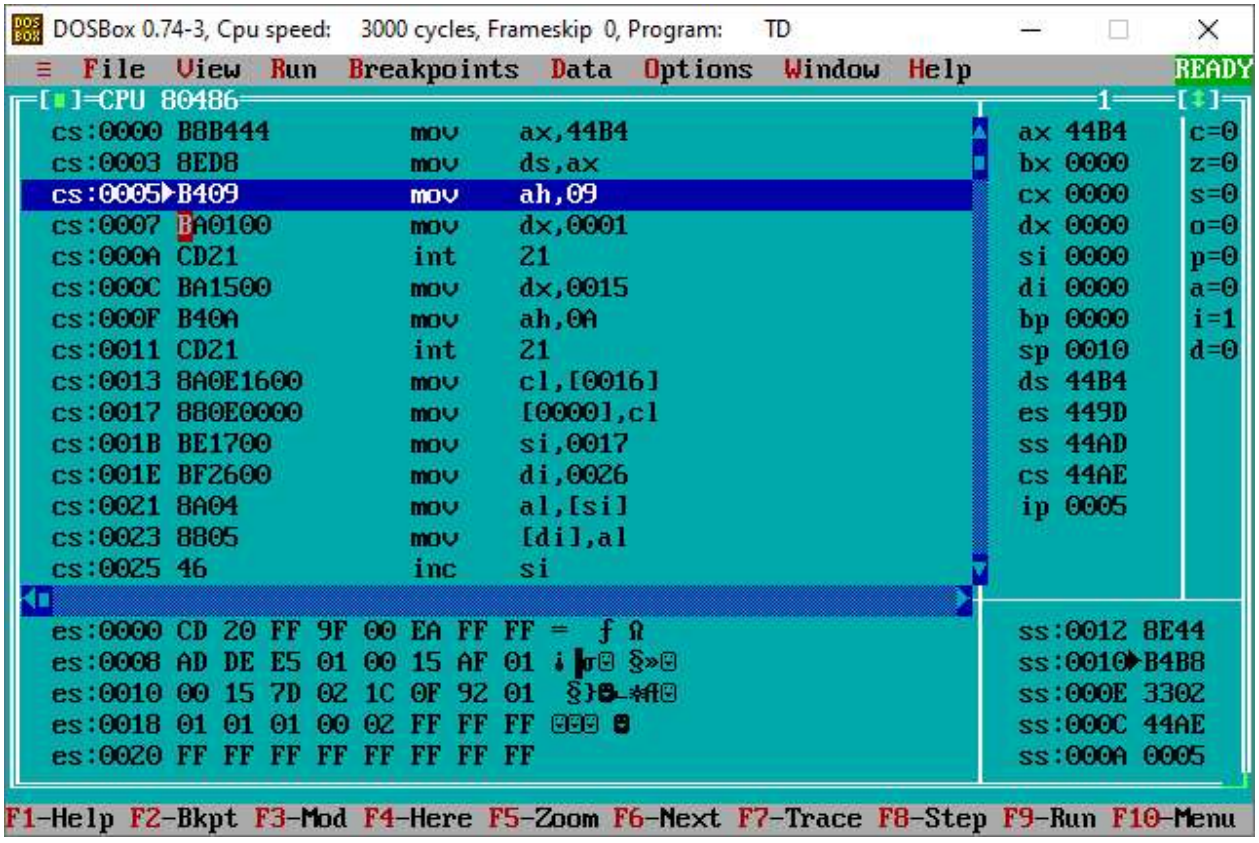

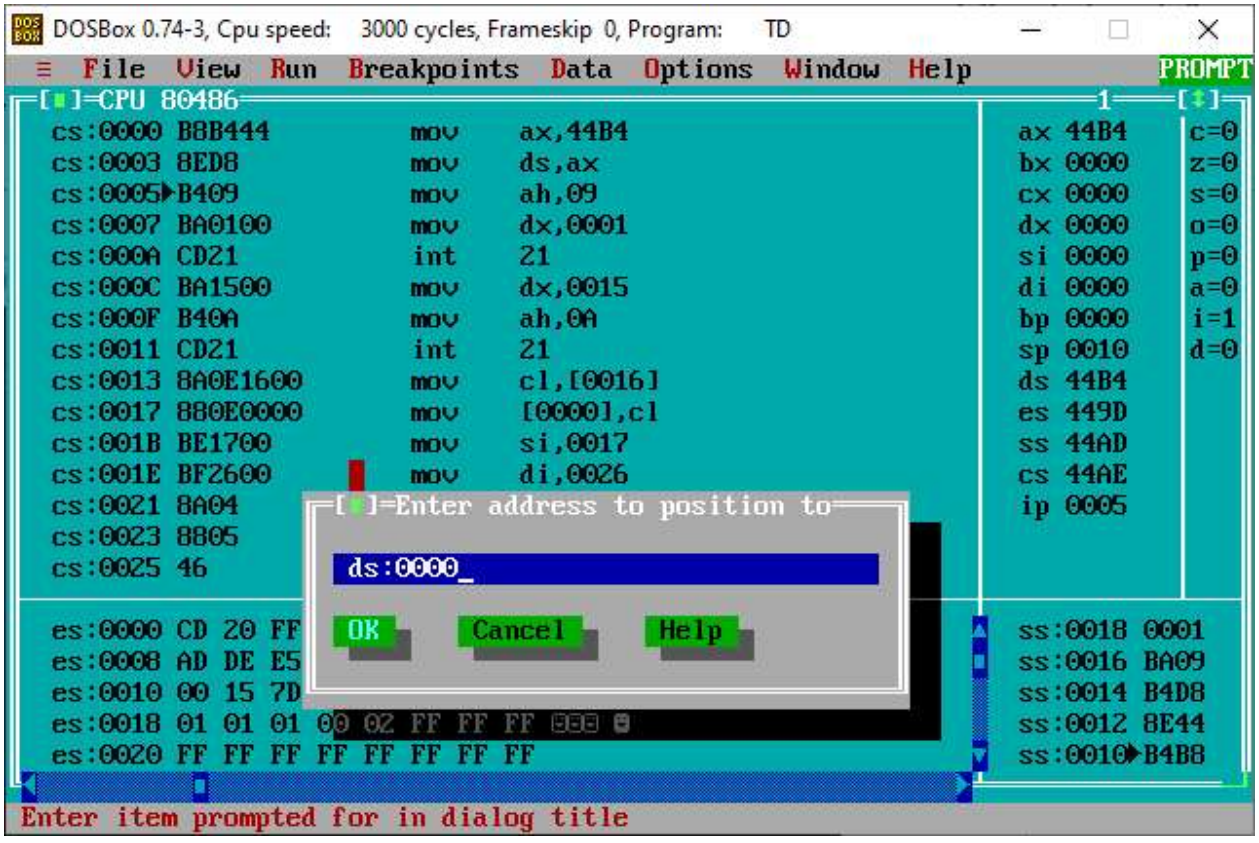

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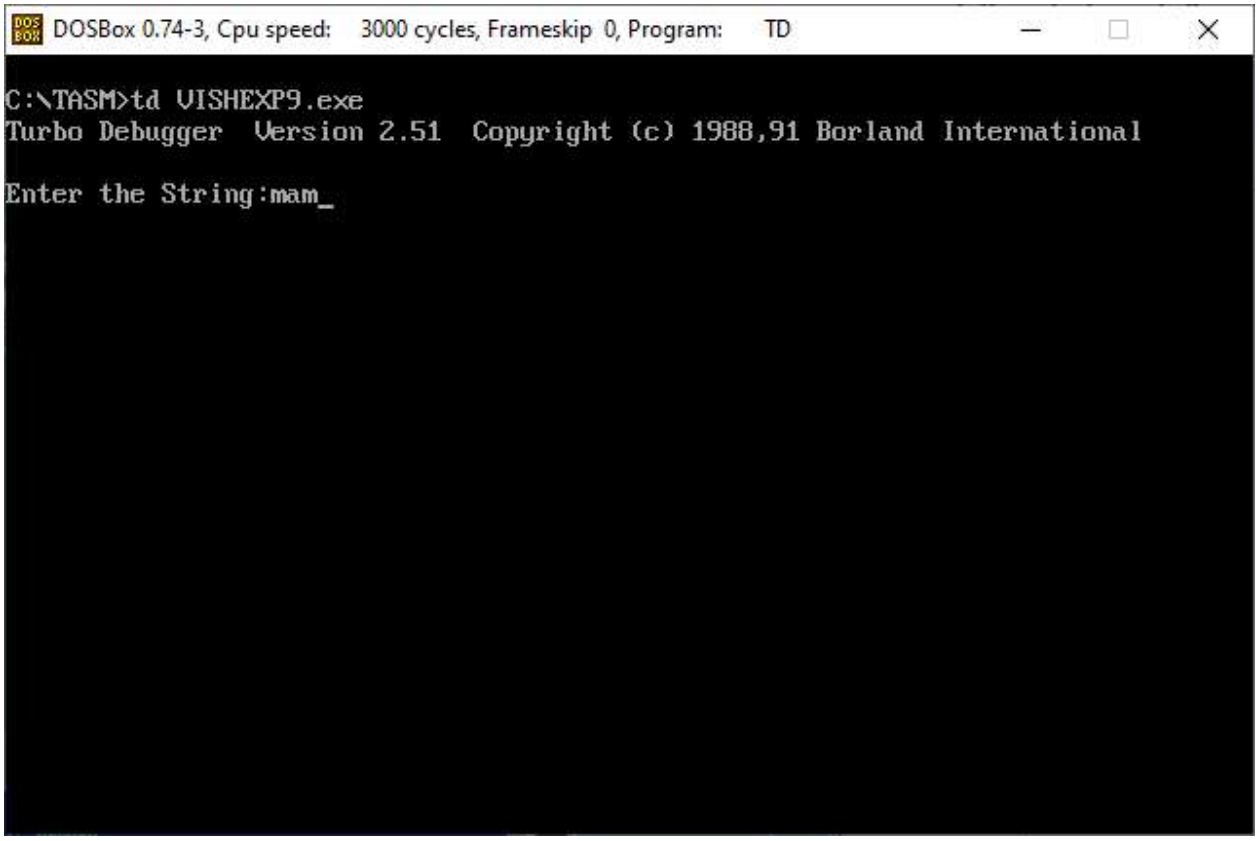

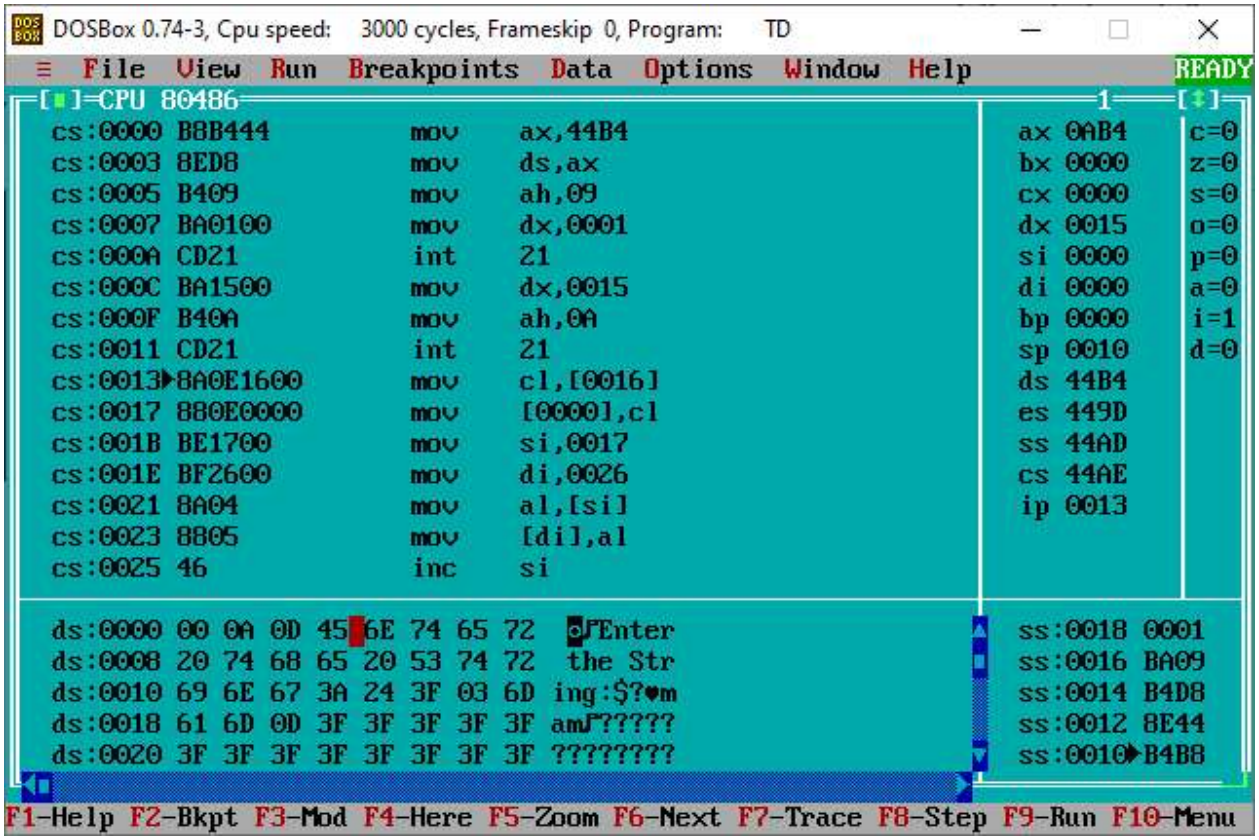

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