|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **3. Develop an assembly language program to reverse a given string and verify whether it is a palindrome or not. Display the appropriate message.** | | | | | | |
| **LABEL** | **NEMONIC** | **OPERANDS** | | |  | **COMMENTS** |
|  | **.MODEL** | **SMALL** | | | **;** |  |
|  | **.DATA** |  | | | **;** |  |
| **STR1** | **DB** | **'MADAM'** | | | **;** | **INPUT STRING** |
| **LEN** | **DW** | **$-STR1** | | | **;** | **LENGTH OF STRING** |
| **STR2** | **DB** | **20 DUP (0)** | | | **;** | **RESERVE FOR REVERSE STRING** |
| **SM** | **DB** | **10,13,'The given string is palindrome$'** | | | **;** | **SUCCESSFUL MESSAGE** |
| **FM** | **DB** | **10,13,'The given string is not palindrome$** | | | **;** | **;UNSUCCESSFUL MESSAGE** |
|  |  |  |  |  | **;** |  |
|  | **.CODE** |  |  |  | **;** |  |
|  | **MOV** | **AX** | **,** | **@DATA** | **;** | **INITIALIZATION OF** |
|  | **MOV** | **DS** | **,** | **AX** | **;** | **DATA SEGMENT** |
|  | **MOV** | **ES** | **,** | **AX** | **;** | **EXTRA SEGMENT** |
|  |  |  |  |  | **;** |  |
|  | **MOV** | **CX** | **,** | **LEN** | **;** | **INITIALIZE COUNTERCX** |
|  | **LEA** | **SI** | **,** | **STR1** | **;** | **INITIALIZE SI TO** |
|  | **ADD** | **SI** | **,** | **LEN** | **;** | **LAST CHAR OF SOURCE** |
|  | **DEC** | **SI** |  |  | **;** | **STRING** |
|  | **LEA** | **DI** | **,** | **STR2** | **;** | **INITIALIZE DI TO DESTINATION STRING** |
|  |  |  |  |  | **;** |  |
| **BACK:** | **MOV** | **AL** | **,** | **[SI]** | **;** | **COPY THE CHARS FROM** |
|  | **MOV** | **[DI]** | **,** | **AL** | **;** | **SOURCE STRING TO** |
|  | **DEC** | **SI** |  |  | **;** | **DESTINATION STRING** |
|  | **INC** | **DI** |  |  | **;** | **CX NUMBER OF TIMES** |
|  | **LOOP** | **BACK** |  |  | **;** |  |
|  |  |  |  |  | **;** |  |
|  |  |  |  |  | **;** |  |
|  | **LEA** | **SI** | **,** | **STR1** | **;** | **INITIALIZE STR1** |
|  | **LEA** | **DI** | **,** | **STR2** | **;** | **INITIALIZE STR2** |
|  | **CLD** |  |  |  | **;** | **SET AUTO-INC MODE**  **DF IS RESET TO 0** |
|  |  |  |  |  | **;** |  |
|  | **MOV** | **CX** | **,** | **LEN** | **;** | **NUMBER OF CHARS TO COMPARE** |
| **REPZ** | **CMPSB** |  |  |  | **;** | **COMPARE UNTIL CX=0 &** |
|  | **JZ** | **SUCC** |  |  | **;** | **DS:[SI] != ES:[DI]** |
|  |  |  |  |  | **;** |  |
|  | **LEA** | **DX** | **,** | **FM** | **;** | **DISPLAY FAILURE MESSAGE** |
|  | **MOV** | **AH** | **,** | **09** | **;** |  |
|  | **INT** | **21H** |  |  | **;** |  |
|  |  |  |  |  | **;** |  |
|  | **JMP** | **EXIT** |  |  | **;** | **JUMP TO TERMINATE** |
|  |  |  |  |  | **;** |  |
| **SUCC:** | **LEA** | **DX** | **,** | **SM** | **;** | **DISPLAY SUCCESS MESSAGE** |
|  | **MOV** | **AH** | **,** | **09** | **;** |  |
|  | **INT** | **21H** |  |  | **;** |  |
|  |  |  |  |  | **;** |  |
|  | **MOV** | **AH** | **,** | **4CH** | **;** | **RETURN TO DOS PROMPT** |
| **EXIT:** | **INT** | **21H** |  |  | **;** |  |
|  | **END** |  |  |  | **;** | **END OF PROGRAM** |

**OUTPUT 1**

* **Edit filename.asm**
* **Masm filename.asm;**
* **Link filename;**
* **Debug filename.exe**

**Given string is : MADAM**

**-- G**

**The given string is palindrome**

**--Q**

**OUTPUT 2**

* **Edit filename.asm**

**Given string is : HELLO**

* **Masm filename.asm;**
* **Link filename;**
* **Debug filename.exe**

**-- G**

**The given string is not palindrome**

**--Q**