MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI

GOVERNMENT POLYTECHNIC OSMANABAD
CERTIFICATE

This is to certify that the micro project entitled-

Implementing a ALP program to check given number is palindrome or not

Submitted by :- **Samarth Vishnu Joshi**
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Roll no:- **21,29,45** in third semester of diploma in computer engineering has completed micro project satisfactorily in the course **Microprocessors (22415)** academic year 2022-2023 as prescribed in the curriculum.

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Submitted by :-

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UNDER THE GUIDANCE
MR.B.R.CHAUHAN

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I will not cease to acknowledge the support of my friends:

Om, Purushottam God bless you all

SAMARTH VISHNU JOSHI

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COMPUTER ENG.

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1. Rationale:

This microproject contains various concept of assembly language programming like class and object. It is used to check whether the number is palindrome or not if it is palindrome then it shows number is palindrome otherwise number is not palindrome.

2. Aim of project :

To develop a simple program of palindrome number checking using various concepts of the assembly language programming.

3. Course outcomes achieved :

- Develop assembly language program using classes and object
- Implement a project by using 8086 concept
- Develop 8086 program to check palindrome number

4. Literature Review :

Assembly language programming is a programming language which is used to program the processor. Its is an low level programming language that is intended to communicate directly with a computers hardware.

INTRODUCTION TO ASSEMBLY LANGUAGE

- An assembly language is a type of programming language that translates high level languages into machine language.
- It is necessary bridge between the software programs and their underlying hardware platforms.
- Assembly language relies on language syntax, labels, operators and directives to convert code into usable machine instruction.
- Assembly language may pass through single pass or multi pass assemblers, each with specific uses and benefits.
- Today assembly language are rarely written directly although they are still used in some niche applications such as when performance requirements are particularly high.

COMPONENTS OF ASSEMBLY LANGUAGE

1. **Syntax:-**

   When writing any code in any program language there is an observable specific order of rules that must be followed to allow a compiler to execute the code without error.

2. **Label**:-

   A label is a symbol that represents the address where an instruction or data is stored. Its purpose is to act as the destination when referenced in a statement. Labels can be used anywhere an address can be used in assembly languages.

3. **Operators**:-

   Also referred to as commands operators are logical expressions that occur after the label field. In addition, it must be preceded by at least one white space character. Operators can be either opcode or directive.

4. **Directives:-**

   Directives are the instructions to the assembler that tell what actions must take place during the assembly process. Directives have the importance of declaring or reserving memory for variables; this variables can be recalled later in the processes to perform more dynamic function .

5. **Macro:-**

   An assembly macro is template shoe format presents a series or pattern pf statements this sequence of assembly language statement s might be common to multiple different programs . A macro facility is used to interpret macro definitions while a macro call is inserted into the source code where normal assembly code would have gone instead of the macro sets of then statements.

ADVANTAGES AND DISADVANTAGES OF ASSEMBLY LANGUAGE

ADVANTAGES

1. Assembly language can usually be executed faster than high level languages.

2. Its relatively easy to insert of delete components of assembly language code.

3. An assembly language usually requires fewer instructions to complete a task when compared against other types of languages.

4. Assembly language are also often used by programmers wanting greater control over their computers.

5. Because of its speed and importance some programmes are specifically written using assembly language code.

DISADVNTAGES

1. Long programmes written using assembly language usually requires high system it cannot be run in small computers.

2. The syntax of assembly language is more difficult to remember as it is complex.

3. The assembly language is usually not portable between different computers.

4. Programming maybe more challenging to compared high llevel languages.

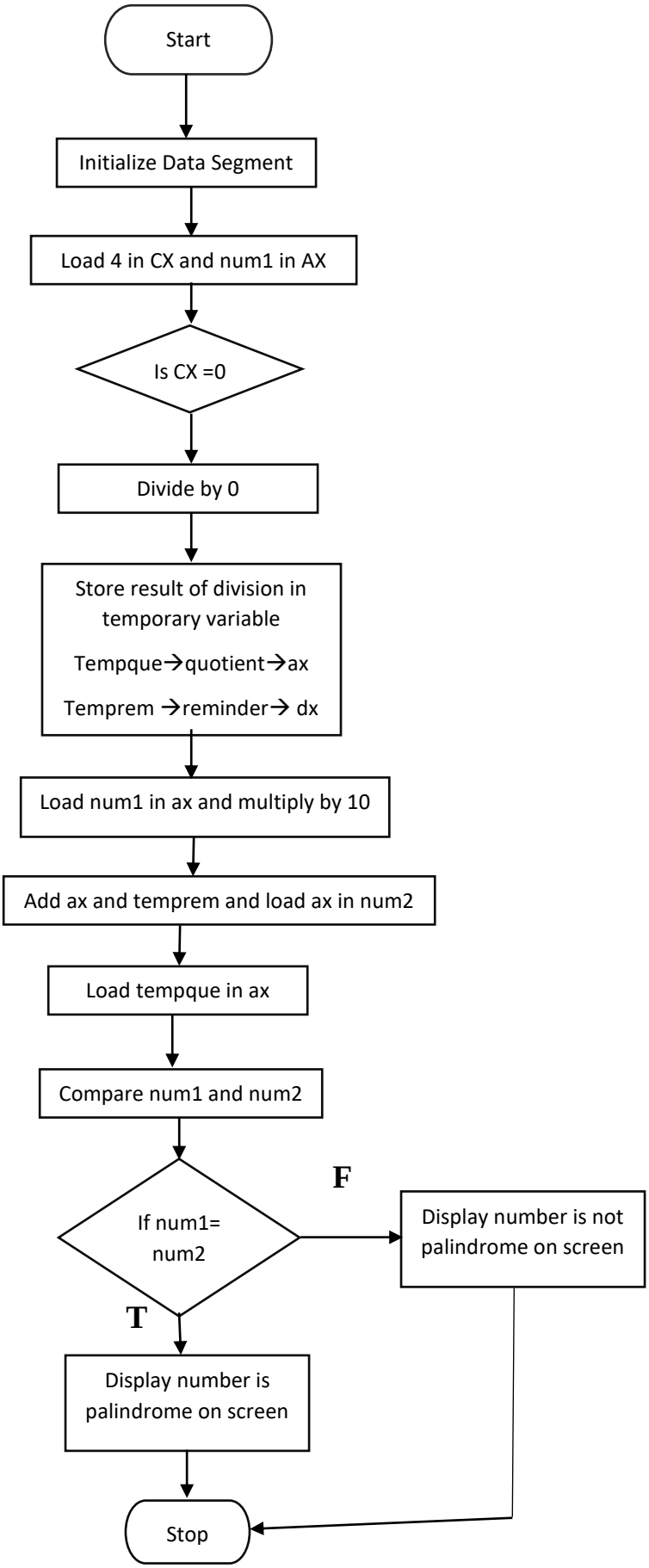
Algorithm

1. Initialize data segment
2. Load 4 in cx and num1 in ax
3. Div by 10
4. Store result of division in temporary variable

    - Tempque – quotient – ax
    - Temprem – reminder – dx

5. Load num1 in ax and multiply by 10
6. Add ax and temprem and load ax in num2
7. Load tempque in ax
8. Is cx = 0 then go to step 9 else go to step 3
9. Compare num1 and num2
10. Is num1= num2 then go to step 11 else go to step 12
11. Display number is palindrome on screen
12. Go to step 13
13. Display number is not palindrome on screen
14. stop

FLOW-CHART

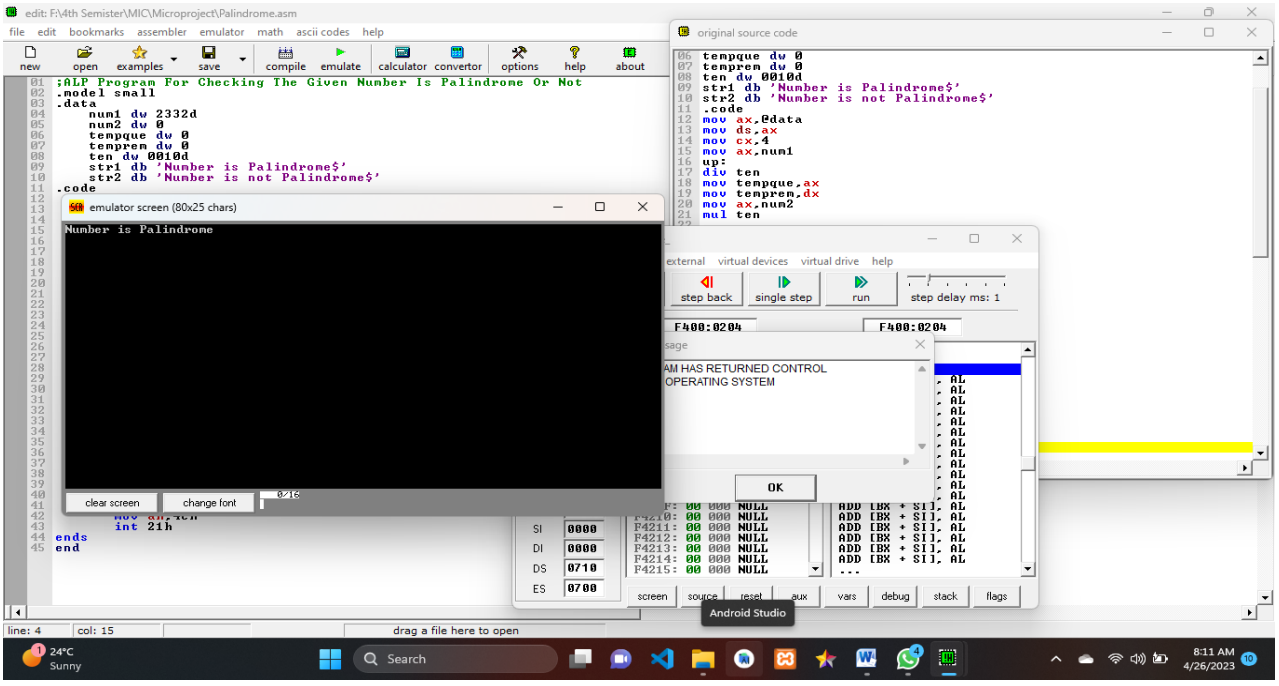

Start
Initialize Data Segment
Load 4 in CX and num1 in AX
Is CX =0
Divide by 0
Store result of division in temporary variable
Tempque→quotient→ax
Temprem →reminder→ dx
Load num1 in ax and multiply by 10
Add ax and temprem and load ax in num2
Load tempque in ax
Compare num1 and num2
If num1= num2
F
Display number is not palindrome on screen
T
Display number is palindrome on screen
Stop

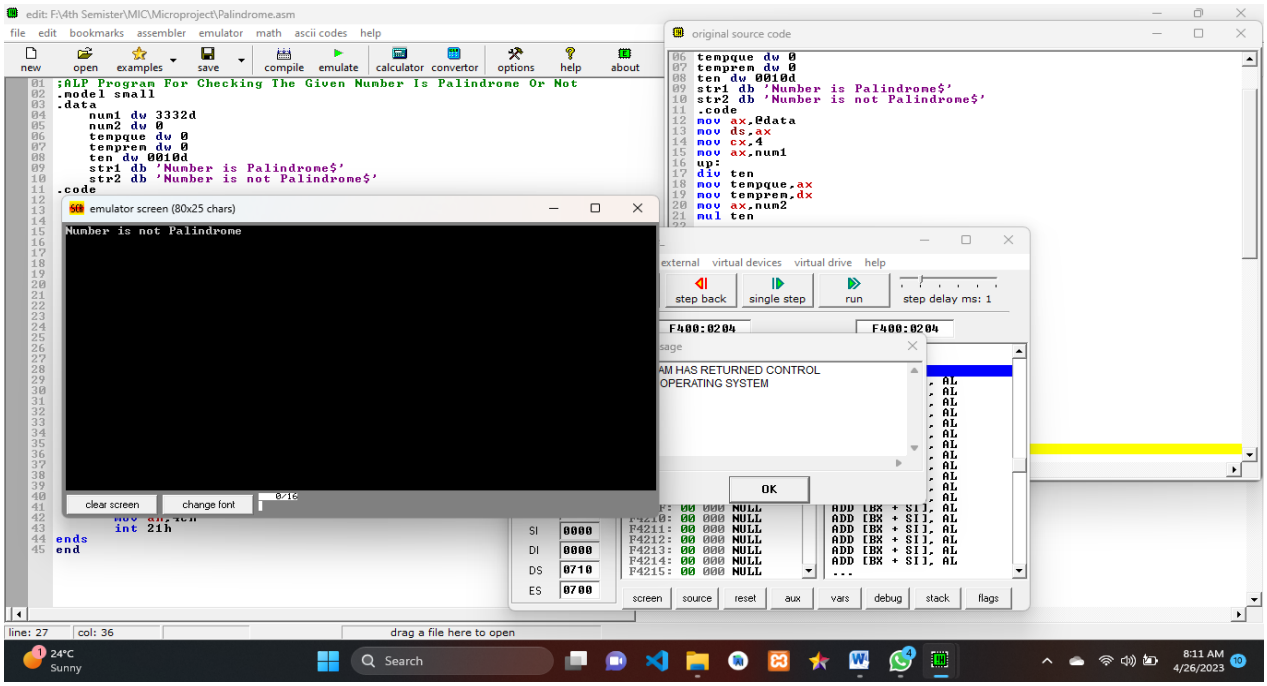
CODE

;ALP Program For Checking The Given Number Is Palindrome Or Not

```
.model small
.data
    num1 dw 3332d
    num2 dw 0
    tempque dw 0
    temprem dw 0
    ten dw 0010d
    str1 db 'Number is Palindrome$'
    str2 db 'Number is not Palindrome$'
.code
    mov ax,@data
    mov ds,ax
    mov cx,4
     mov ax,num1
  up:
    div ten
    mov tempque,ax
    mov temprem,dx
    mov ax,num2
    mul ten
    add ax,temprem
    mov num2,ax
    mov ax,tempque
    loop up
    mov ax,num1
    mov bx,num2
    cmp ax,bx
    je down
       mov ah,09h
       lea dx,str2
       int 21h
       jmp end
  down:
       mov ah,09h
       lea dx,str1
       int 21h
  end:
       mov ah,4ch
       int 21h
ends
end
```

Output


edit: F:\4th Semister\MIC\Microproject\Palindrome.asm
original source code
emulator screen (80x25 chars)
Number is Palindrome
clear screen
change font
AM HAS RETURNED CONTROL
OPERATING SYSTEM
OK
Android Studio


edit: F:\4th Semister\MIC\Microproject\Palindrome.asm
original source code
emulator screen (80x25 chars)
Number is not Palindrome
clear screen
change font
AM HAS RETURNED CONTROL
OPERATING SYSTEM
OK

ACTUAL RESOURCES USED

Sr No.	Name Of Resource	Specification	Quantity
1.	Laptop	RAM-8 GB, Processor-Intel Core i5	1
2	System type	64-bit operating system (windows)	1
3	Software	EMU 8086	1

CONCLUSION :

In this project we learn about ALP program to How to find the given number is palindrome or not

REFERENCE:

- https://www.tutorialpoint.com .
- https://www.javatpoint.com
- https://www.geeksforgeeks.org