# Assignment 07 | MFP
# CE-092

Assignment submission for Microprocessor Fundamentals and Programming  subject week 7.

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## Task 1:

Write a program to check whether a given number is an Armstrong number.Display appropriate message.

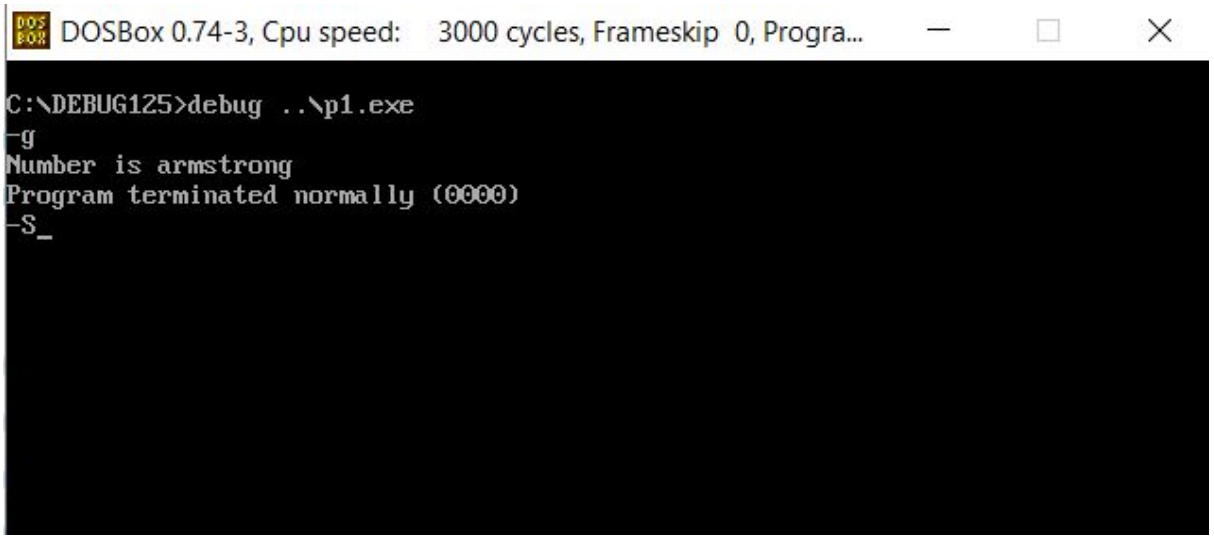
Code:

```
data segment
    num db "371"
    str1 db "Number is not armstrong$"
    str2 db "Number is armstrong$"
data ends
code segment
    assume cs:code,ds:data

start:
        mov ax,data
        mov ds,ax
        mov si,offset num
        mov ax,0000h
        mov cx,0003h
next:
        mov ax,0000h
        mov bl,[si]
        and bl,0fh
```

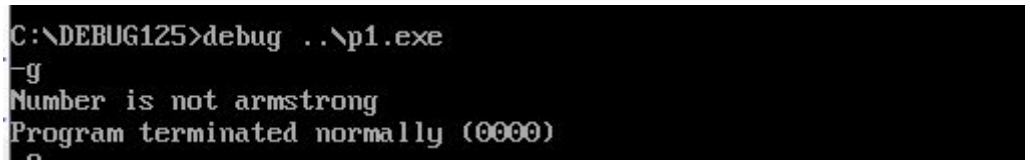
```
        mov al,bl
        mul bl
        mul bl
        add dx,ax
        inc si
        Loop next
        cmp dx,371d
        jnz notarm
        mov dx,offset str2
        jmp ex
notarm:
        mov dx,offset str1
        jmp ex
ex:
        mov ah,9h
        int 21h
        mov ax,4c00h
        int 21h
code ends
end start
```

Output:

**Check for Num = 371**



**Check for Num = 105**




## Task 2:

Write a program to check whether two strings are the same irrespective of their case.

Code:

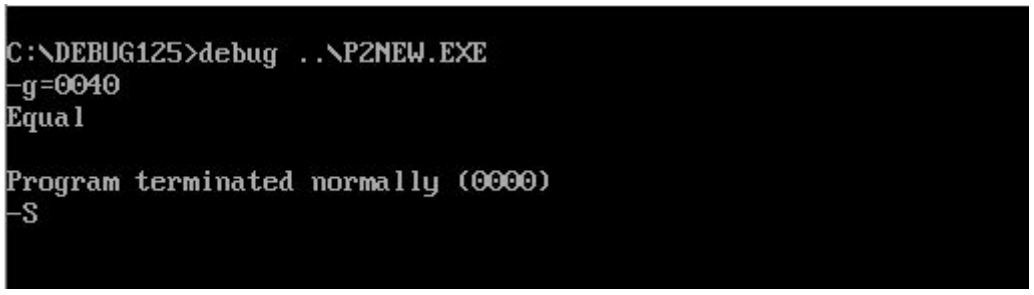
```
data segment
    str1 db "abc"
    len1 db $-str1
    str2 db "ABd"
    len2 db $-str2
    msg1 db "Equal",13,10,"$"
    msg2 db "Not Equal" ,13,10,"$"
    lookUp db "abcdefghijklmnopqrstuvwxyz"
data ends

code segment
    assume cs:code,ds:data
    mov ax,data
    mov ds,ax
    mov al,len1
    cmp al,len2
    jnz notequal
    mov bx,offset lookUp
    mov si,offset str1
    mov di,offset str2
```

```
    mov cl,len1
start:
    mov al,[si]
    cmp al,'a'
    jl S1
CONTINUE1:
    mov dl,al
    mov al,[di]
    cmp al,'a'
    jl S2
CONTINUE2:
    cmp al,dl
    jnz notequal
    inc si
    inc di
    loop start
    jmp equal
notequal:
    mov dx,offset msg2
    mov ah,09h
    int 21h
    jmp stop
equal:
    mov dx,offset msg1
    mov ah,09h
    int 21h
stop:
    mov ax,4c00h
    int 21h
S1:
    sub al,'A'
    xlat
```

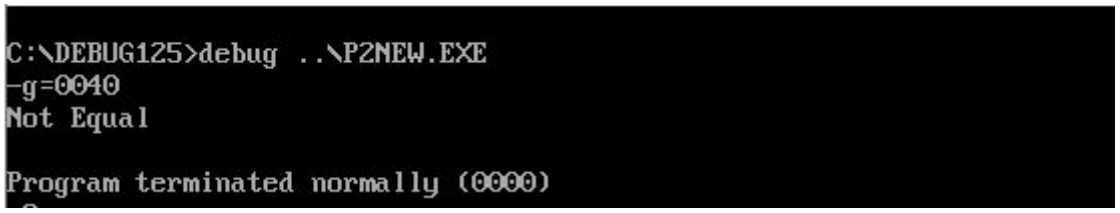
```
    jmp CONTINUE1
S2:
    sub al,'A'
    xlat
    jmp CONTINUE2
code ends
end
```

Output:

**Str1 = “abc” & str2 = “ABC”**




**Str1 = “abc” & str2 = “ABd”**




## Task 3:

Write a Program to check whether the input string is palindrome or not. Get the string through the user.

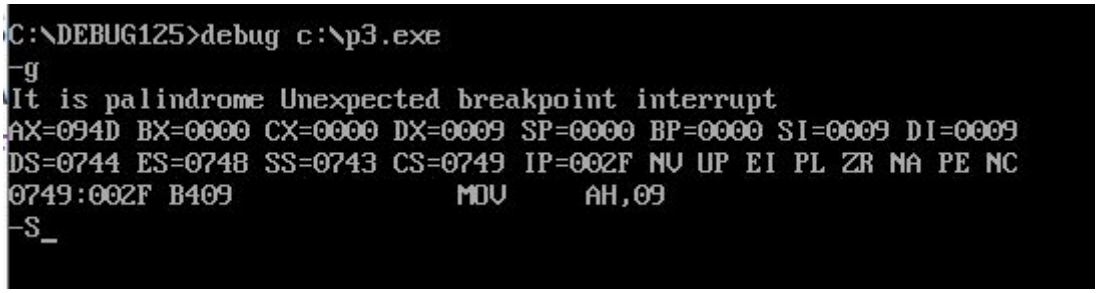
Code:

```
DATA SEGMENT
    BLOCK1 DB 'MALAYALAM'
    MSG1 DB "It is palindrome $"
    MSG2 DB "It is not palindrome $"
DATA ENDS
```

```
PRINT MACRO MSG
    MOV AH,09H
    LEA DX,MSG
    INT 21H
    INT 3H
ENDM

EXTRA SEGMENT
    BLOCK2 DB 9 DUP(?)
EXTRA ENDS

CODE SEGMENT
    ASSUME CS:CODE,DS:DATA,ES:EXTRA
START:
    MOV AX,DATA
    MOV DS,AX
    MOV AX,EXTRA
    MOV ES,AX
    LEA SI,BLOCK1
    LEA DI,BLOCK2+8
    MOV CX,00009H
BACK:
    CLD
    LODSB
    STD
    STOSB
    LOOP BACK

    LEA SI,BLOCK1
    LEA DI,BLOCK2
    MOV CX,0009H
```

```
    CLD
    REPZ CMPSB
    JNZ SKIP
    PRINT MSG1
SKIP:
     PRINT MSG2
CODE ENDS
END START
```

Output:




## Task 4:

Write a program to search an element from a sorted list using binary search.

Code:

```
data segment
     array dw
0000h,0001h,0002h,0003h,0004h,0005h,0006h,0007h,0008h,0
009h
     len dw ($-array)/2
     key equ 0007h
     msg db "key is found at "
     res db "  position",13,10," $"
     notfoundstr db 'not found $'
data ends
```

```
code segment
    assume ds:data,cs:code
start:
      mov ax,data
      mov ds,ax

      mov bx,00
      mov dx,len
      mov cx,key
binary_search:
      cmp bx,dx
       ja notfound
       mov ax,dx
       add ax,bx
       shr ax,1
       mov si,ax
       add si,si
       cmp cx,array[si]
       jae big
       dec ax
       mov dx,ax
       jmp binary_search
big:
      je success
      inc ax
      mov bx,ax
      jmp binary_search
success:
      add al,01
      add al,'0'
      mov res,al
```

```
        lea dx,msg
        jmp result

notfound:
        lea dx,notfoundstr

result:
        mov ah,09h
        int 21h

        mov ah,4ch
        int 21h
code ends
end start
```

Output:

**Search for key = 0007h**

```
C:\DEBUG125>debug ..\p4new.exe
-g
key is found at 8 position

Program terminated normally (0038)
-S
```

**Search for key = 0010h**

```
C:\DEBUG125>debug ..\p4new.exe
-g
not found
Program terminated normally (000B)
```

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