

<b>Course Name:</b>	<b>Microprocessors and Peripherals (2UXC404)</b>	<b>Semester:</b>	<b>IV</b>
<b>Date of Performance:</b>	1-04-2021	<b>Batch No:</b>	B2
<b>Faculty Name:</b>	KCS	<b>Roll No:</b>	1912052
<b>Faculty Sign &amp; Date:</b>		<b>Grade/Marks :</b>	___/25

## Experiment No: 5

**Title:** Programmable Delays

<b>Aim and Objective of the Experiment:</b>
<p><b>Aim:</b> Write an 8086 based ALP to</p> <ol style="list-style-type: none"> <li>1. Generate delay with software instructions using intrasegment and intersegment procedures</li> </ol> <p>Case study: Display two strings on monitor with a delay of 100ms using near and far procedures.</p> <p><b>Objectives:</b></p> <ol style="list-style-type: none"> <li>1. To study far and near call techniques in programming of 8086</li> <li>2. To study procedures and macros</li> <li>3. To study timing calculations of instructions</li> <li>4. To study DOS interrupts</li> </ol> <p>This experiment covers</p> <ol style="list-style-type: none"> <li>1. Data transfer instructions</li> <li>2. DOS interrupts for displaying strings and characters on monitor.</li> <li>3. Delay calculations</li> </ol>

<b>COs to be achieved:</b>
<b>CO 2.</b> Develop 8086 based assembly language programs for various applications.

<b>Useful links</b>
<p>NASM Assembler  <a href="https://www.tutorialspoint.com/compile_assembly_online.php">https://www.tutorialspoint.com/compile_assembly_online.php</a></p> <p>Simulator/Emulator:  <a href="https://emu8086-microprocessor-emulator.en.softonic.com/download">https://emu8086-microprocessor-emulator.en.softonic.com/download</a></p> <p>DOSBox x86 emulator  <a href="https://sourceforge.net/projects/dosbox/">https://sourceforge.net/projects/dosbox/</a></p> <p>MASM/TASM assembler</p>

**Work to be done**

1. Upload image of handwritten algorithm/flowchart and 1st file of the program and output screenshots . Also upload results for post lab questions.

data segment

msg1 db "Name",'\$'

msg2 db 09,"Vedant",10,13,'\$'

data ends

stack segment

dw 100 dup(0)

stack\_top label word

stack ends

code segment

assume sc:code, ds:data, ss:stack

start:mov ax,data

mov ds,ax

all:mov ah,09

lea dx,msg1

int 21h

call delay

mov ah,09

lea dx,msg2

int 21h

call delay

jmp all

delay proc near

mov bx,0fh

repeat:mov cx,0fH

back:loop back

dec bx

jnz repeat

ret

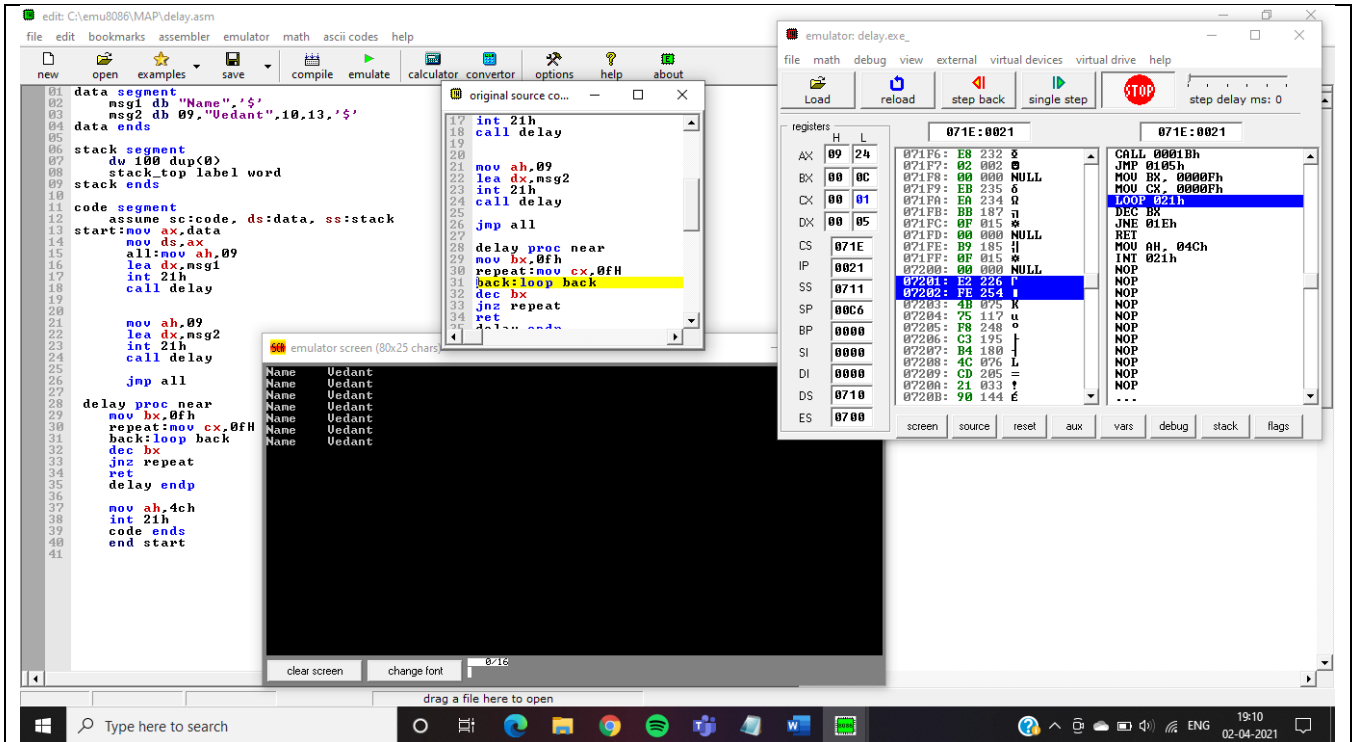
delay endp

mov ah,4ch

int 21h

code ends

end start



### Post Lab Subjective/Objective type Questions:

Q1. Write an 8086 based ALP to display character 'A' to 'Z' on the screen. Use macro. code segment  
 assume cs:code, ds:data, ss:stack

```

mov ah,02h
mov cx,26
mov dl,41h

```

```

back:
int 21h
inc dl
loop back

```

```

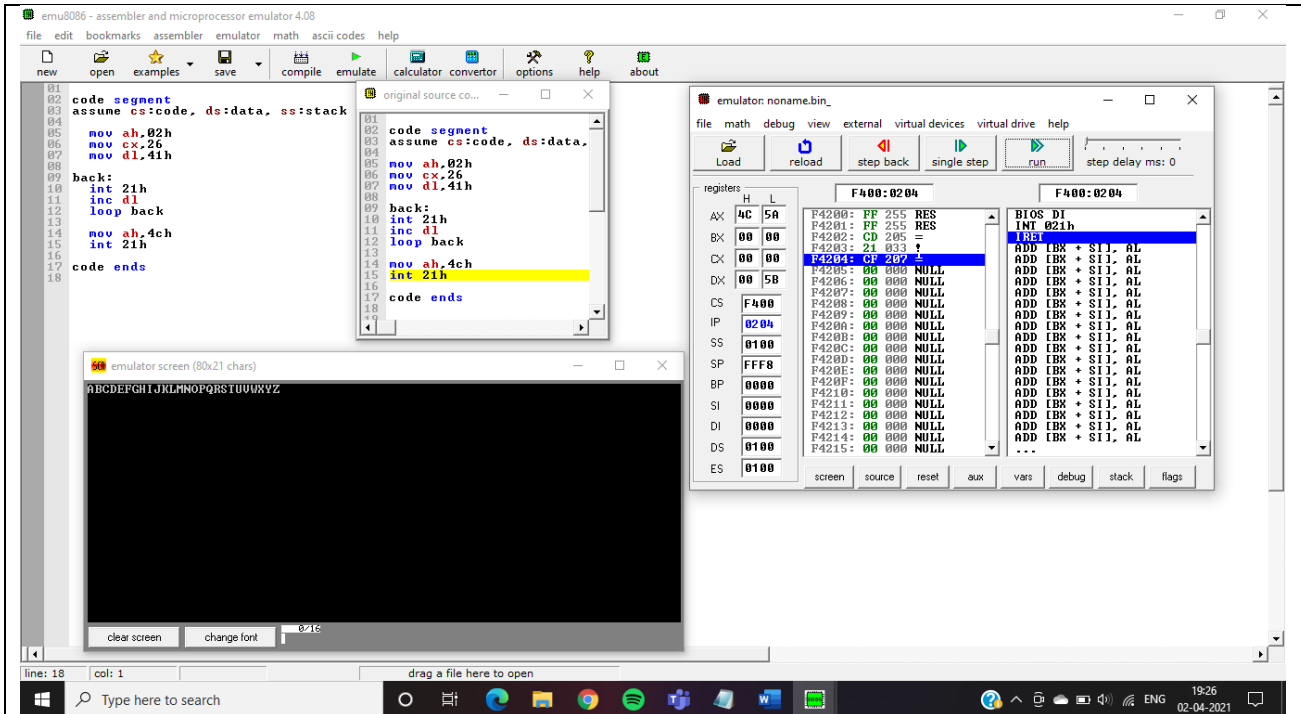
mov ah,4ch
int 21h

```

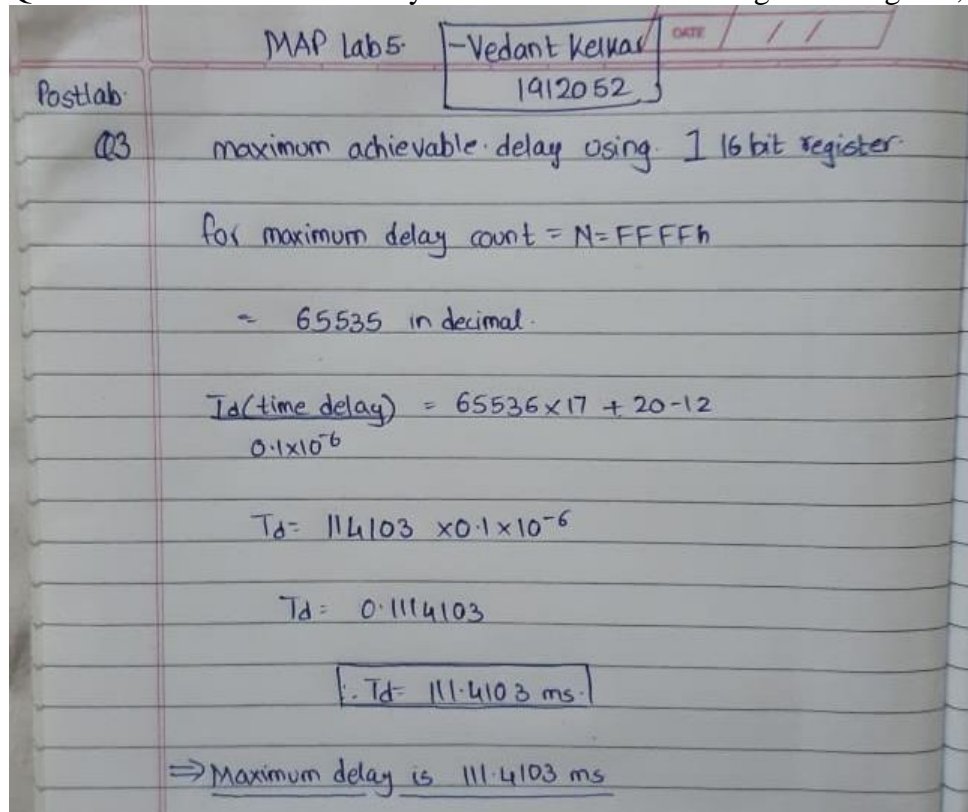
```

code ends

```



Q2. What is the maximum delay that can be achieved using 16 bit register, Show calculations



Q3. What are limitations of software time delays?



Here are a couple of drawbacks of using delay :

- Inaccuracy
- Unable to multitask

**Conclusion:** Display two strings on monitor with a delay of 100ms using emu 8086.

**Signature of faculty in-charge with  
Date:**