

Assignment 11 | MFP

CE-092

Assignment submission for Microprocessor Fundamentals and Programming subject week 11.

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Task 1:

Write an assembly language to handle the divide by zero interrupt.

Driver Code:

```
data segment
    string db "Can't Divide By Zero",13,10,"$"
data ends

stacks segment
    stack dw 20 dup(0)
    top label word
stacks ends

code segment
    assume cs:code,ds:data,ss:stacks
    mov ax,data
    mov ds,ax
    mov ax,stacks
    mov ss,ax
    mov sp,top
    mov ax,0000
    mov es,ax
```

```

    mov word ptr es:0000,offset division
    mov word ptr es:0002,seg division
    mov ax,0005
    mov bl,00
    div bl
    int 03h

division proc near
    lea dx,string
    mov ah,09
    int 21h
    pop bx
    add bx,2
    push bx
    iret
division endp

code ends
end

```

Output:

```

C:\DEBUG125>debug ..\p1.exe
-g=0050
Can't Divide By Zero
Unexpected breakpoint interrupt
AX=0905 BX=0079 CX=0087 DX=0000 SP=0000 BP=0000 SI=0000 DI=0000
DS=0744 ES=0000 SS=0746 CS=0744 IP=007A NU UP EI PL ZR NA PE NC
0744:007A BA0000          MOV     DX,0000

```

Task 2:

Write a program to override the overflow interrupt.

Driver Code:

```

data segment

```

```

    string db "Overflow",13,10,"$"
data ends

stacks segment
    stack dw 20 dup(0)
    top label word
stacks ends

code segment
    assume cs:code,ds:data,ss:stacks
    mov ax,data
    mov ds,ax
    mov ax,stacks
    mov ss,ax
    mov sp,top
    mov ax,0000
    mov es,ax
    mov word ptr es:0010h,offset overflow
    mov word ptr es:0012h,seg overflow
    mov al,100
    add al,100
    INTO
    int 03h

overflow proc near
    lea dx,string
    mov ah,09
    int 21h
    iret
overflow endp

code ends
end

```

Output:

```
C:\DEBUG125>debug ..\p2.exe
-g=0040
Overflow
Unexpected breakpoint interrupt
AX=09C8 BX=0000 CX=0070 DX=0000 SP=0000 BP=0000 SI=0000 DI=0000
DS=0744 ES=0000 SS=0745 CS=0744 IP=0068 OV UP EI NG NZ NA PO NC
0744:0068 BA0000          MOV     DX,0000
```

Task 3:

Write a program to find the factorial recursively and find the nCr.

Driver Code:

```
data segment
    n db 4
    r db 2
    answer db ?
data ends

stacks segment
    stack dw 20 dup(0)
    top label word
stacks ends

code segment
    assume cs:code,ds:data,ss:stacks
    mov ax,data
    mov ds,ax
    mov ax,stacks
    mov ss,ax
    mov sp,top
    mov si,offset n
```

```

    mov di,offset r

    call ncr
    mov answer,al
    int 03h

ncr proc near
    XOR ax,ax
    mov al,BYTE PTR [di]
    mov bl,01
    call fact
    mov cx,ax
    XOR ax,ax
    mov al,BYTE PTR [si]
    mov bl,al
    sub bl,BYTE PTR [di]
    call fact
    div cl
    ret
ncr endp

fact proc near
    cmp al,bl
    jle stop
    push ax
    dec ax
    call fact
    pop dx
    mul dx
    ret
stop:
    mov ax,0001
    ret
fact endp

```

```
code ends
end
```

Output:

```
C:\DEBUG125>debug ..\p3.exe
-g=0040
Unexpected breakpoint interrupt
AX=0006 BX=0002 CX=0002 DX=0000 SP=0000 BP=0000 SI=0000 DI=0001
DS=0744 ES=0734 SS=0745 CS=0744 IP=005C NU UP EI PL NZ NA PE NC
0744:005C 33C0          XOR     AX,AX
-d
0744:0000  04 02 06 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0744:0010  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0744:0020  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0744:0030  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0744:0040  B8 44 07 8E D8 B8 45 07-8E D0 36 8B 26 28 00 BE .D....E...6.&(..
0744:0050  00 00 BF 01 00 E8 04 00-A2 02 00 CC 33 C0 8A 05 .....3...
0744:0060  B3 01 E8 10 00 8B C8 33-C0 8A 04 8A D8 2A 1D E8 .....3.....*..
0744:0070  03 00 F6 F1 C3 3A C3 7E-09 50 48 E8 F7 FF 5A F7 .....:~.PH...Z.
```

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