National University
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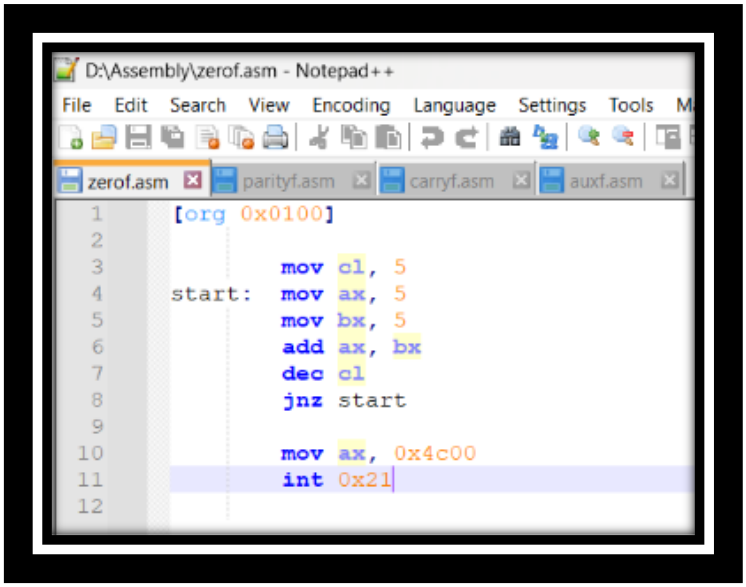
**Section:** BCS-3(A)

**Question No. 1:**

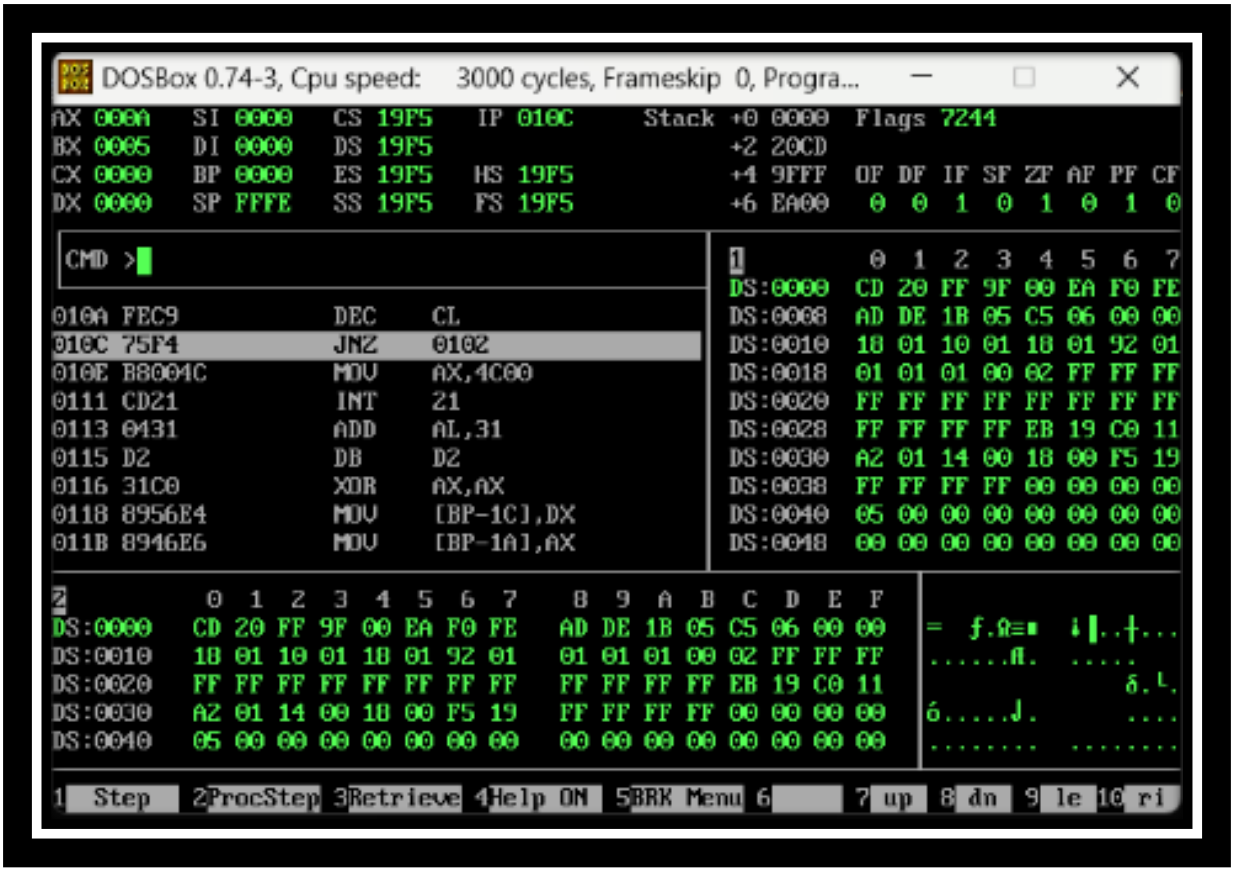
Write a program in assembly language for each of the below separately that sets the following flags. (Write four programs i.e. One for each part)

1. **Zero Flag**

## Code:

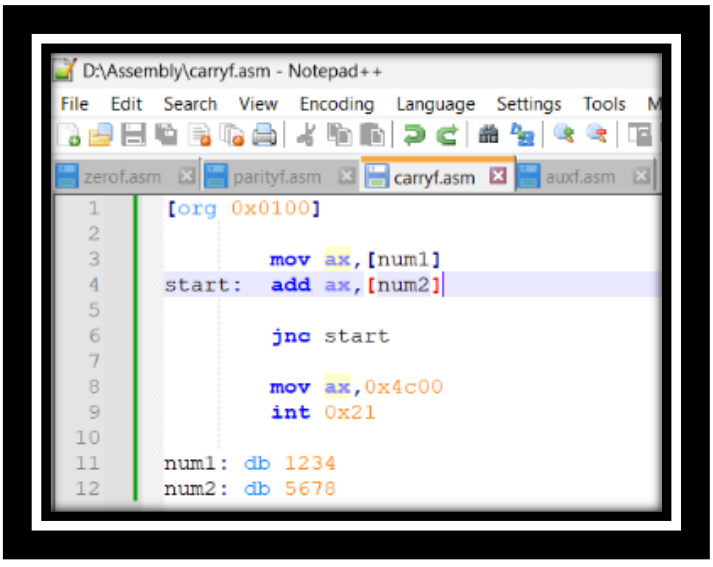



## Output:

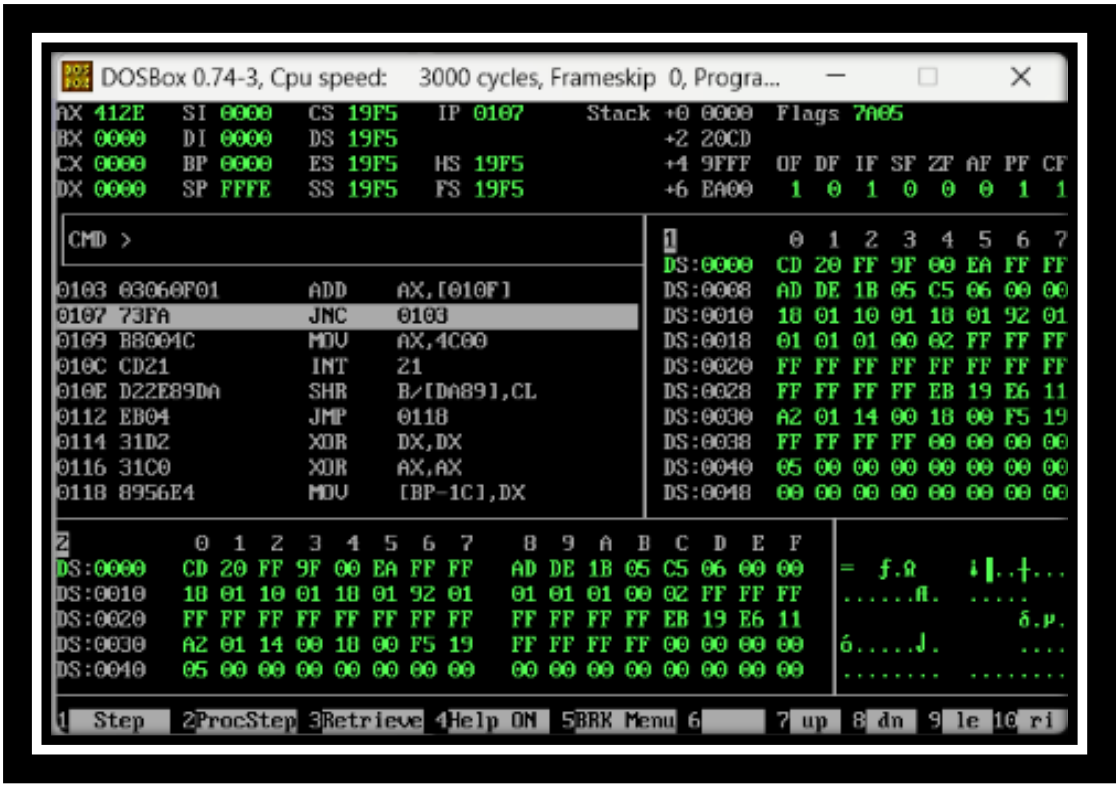



2. **Carry Flag**

## Code:

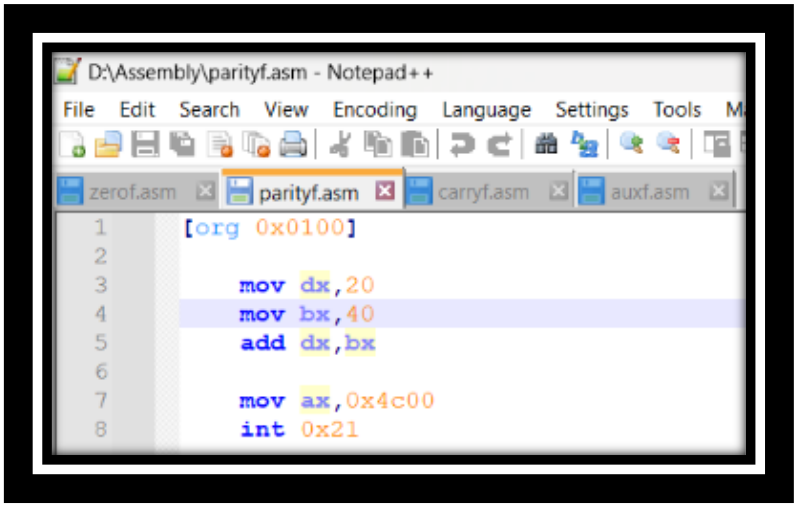



## Output:

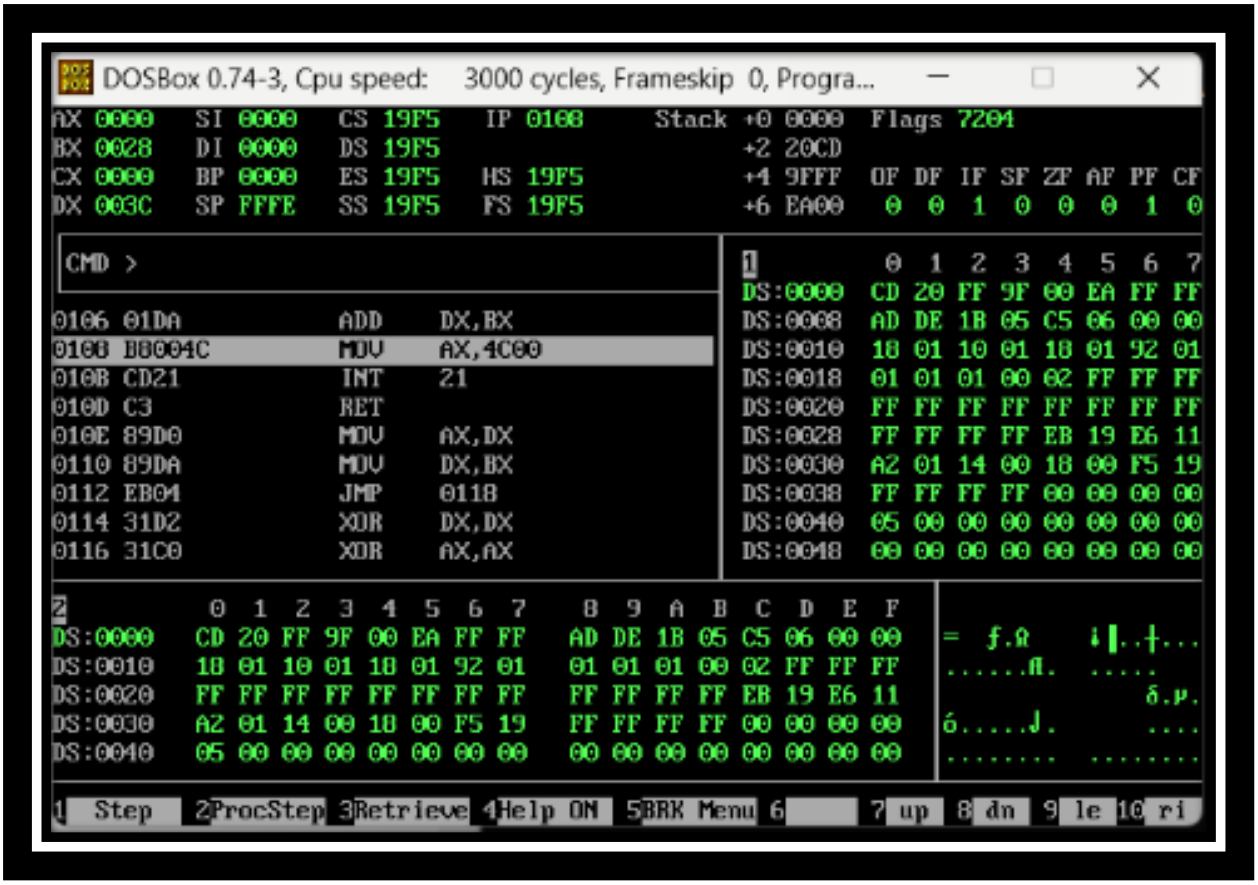



3. **Parity Flag**

## Code:

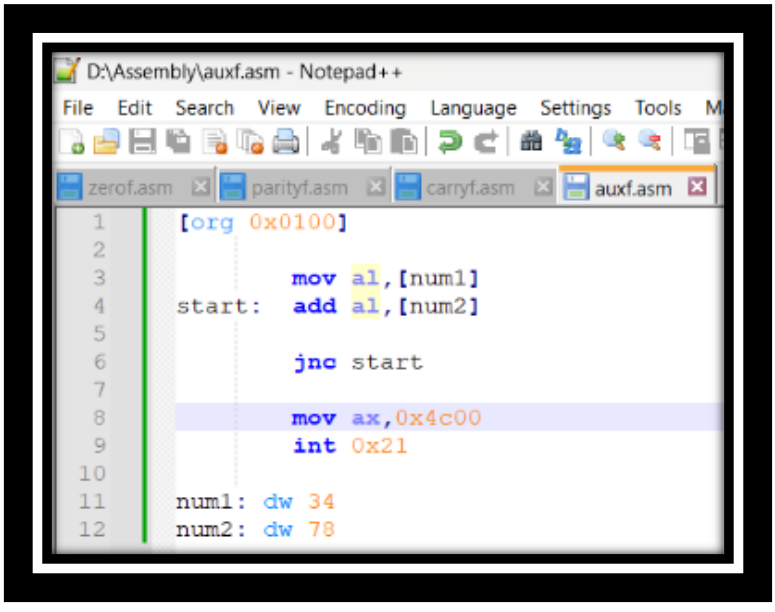



## Output:

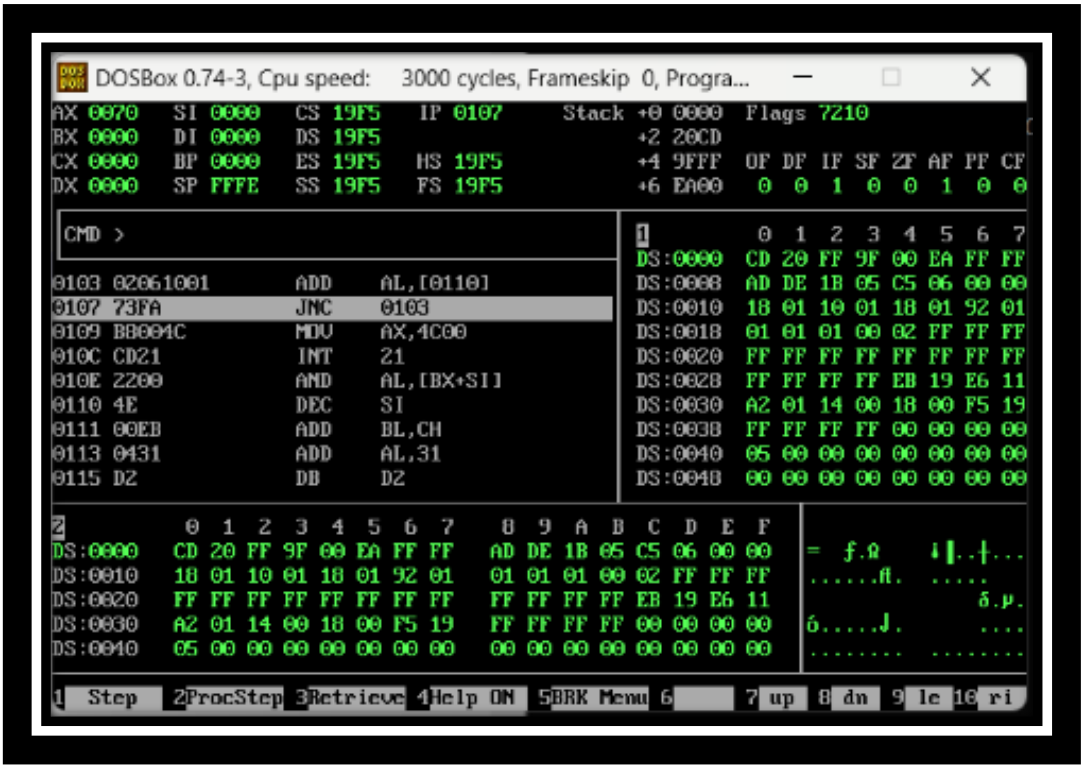



4. **Auxiliary Flag**

## Code:




## Output:




**Question No. 2:**

- What will be the size of the following assembly language program in bytes? Explain your answer using ". lst" file of this code.

[org 0x0100]

mov ax, 5

mov bx, 10

add ax, bx

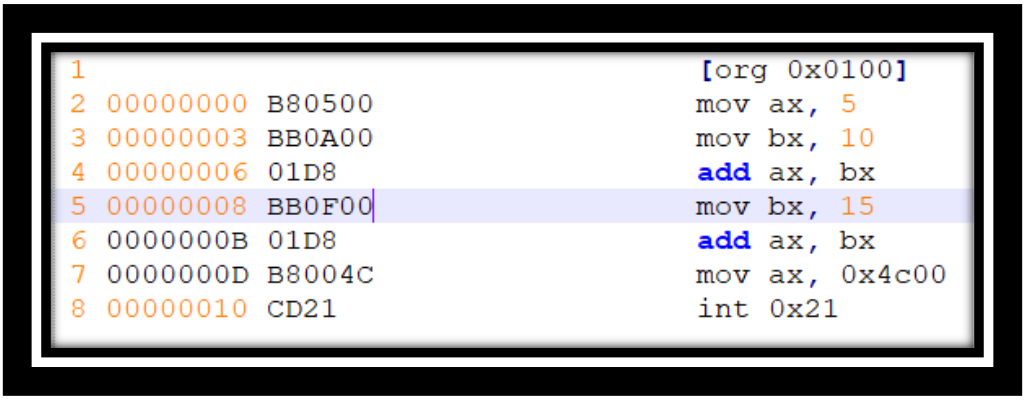
mov bx, 15

add ax, bx

mov ax, 0x4c00

int 0x21

**Solution:**



```
1                                       [org 0x0100]
2  00000000 B80500                      mov ax, 5
3  00000003 BB0A00                      mov bx, 10
4  00000006 01D8                        add ax, bx
5  00000008 BB0F00                      mov bx, 15
6  0000000B 01D8                        add ax, bx
7  0000000D B8004C                      mov ax, 0x4c00
8  00000010 CD21                        int 0x21
```

Explanation:

**[org 0x0100]** - This is not an instruction and does not occupy any memory.

**mov ax, 5**. This instruction takes 3 bytes.

**mov bx, 10**. This instruction takes 3 bytes.

**add ax, bx**. This instruction takes 2 bytes.

**mov bx,15**. This instruction takes 3 bytes.

**add ax, bx**. This instruction takes 2 bytes.

**mov ax, 0x4c00**. This instruction takes 3 bytes.

**int 0x21**. This instruction takes 2 bytes.

Adding up all the byte counts: 3+3+2+3+2+3+2 = 18 bytes.

Therefore, the total size of this program is 18 bytes.

**Question No. 3:**

- Calculate the physical memory address generated by the following segment and offset pairs:
  **Solution:**
  By using Formula (Segment x 10h) + Offset pair

**a) 1DDD:0436**

1DDD0
+00436
_____
Answer: 1E206h

**b) 1234:7920**

12340
+7920
_____
Answer: 19C60h

**c) 74F0:2123**

74F00
+2123
_____
Answer: 77023h

**d) 0000:6727**

00000
+6727
_____
Answer: 06727h

**e) FFFF:4336**

FFFF0
+4336
_____
104326

Answer: 104326h since physical address is of 20bit hence we discard 1 at MSB, 04326h

**f) 1080:0100**

10800
+0100
_____
Answer: 10900h