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Lab 12

Tasks

Task 1:

Verify that CLA sets the accumulator (AC) to zero.

INP

OUT

CLA

OUT

HALT

```
EXECUTING...
Enter Inputs, the first of which must be an Integer: 9
Output:  9
Output:  0
EXECUTION HALTED NORMALLY due to the setting of the bit(s): [HALT-BIT]
```

Task 2:

Verify that CMA inverts all bits in the AC.

INP

CMA

OUT

HALT

File

Edit

Modify

Execute

Help

Data

Bin

Registers

Name	Width	Data
AC	16	0000 0000 0000 0000
AR	12	0000 0000 0000
DR	16	0000 0000 0000 0000
E	1	0
I	1	0
IR	16	0000 0000 0000 0000
PC	12	0000 0000 0000
S	1	0

*Untitled x

1

INP

2

CMA

3

OUT

4

HALT

5

Addr

Dec

Data

Dec

MAIN

Addr	Data
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0

Output:

lab

File Edit Modify Execute Help

Data

Bin

Registers

Name	Width	Data
AC	16	1111 1111 1111 1100
AR	12	0000 0000 0001
DR	16	0000 0000 0000 0000
E	1	0
I	1	0
IR	16	1110 0000 0000 0001
PC	12	0000 0000 0100
S	1	1

CMA(1).a x

```

1 INP
2 CMA
3 OUT
4 HALT
5

```

Addr

Dec

Data

Dec

MAIN

Addr	Data
0	63488
1	57856
2	62464
3	57345
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0

EXECUTING...

Enter Inputs, the first of which must be an Integer: 3

Output: -4

EXECUTION HALTED NORMALLY due to the setting of the bit(s): [HALT-BIT]

Task 3:

INP

INC

OUT

HALT

File Edit Modify Execute Help

Data Bin

Registers	Name	Width	Data
AC	16	0000 0000 0000 0101	
AR	12	0000 0000 0001	
DR	16	0000 0000 0000 0000	
E	1	0	
I	1	0	
IR	16	1110 0000 0000 0001	
PC	12	0000 0000 0100	
S	1	1	

1 INP
2 INC
3 OUT
4 HALT

MAIN	Addr	Data
0	63488	
1	57376	
2	62464	
3	57345	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	
11	0	
12	0	
13	0	
14	0	
15	0	
16	0	
17	0	
18	0	
19	0	
20	0	
21	0	
22	0	

EXECUTING...
Enter Inputs, the first of which must be an Integer: 2
Output: 5
EXECUTION HALTED NORMALLY due to the setting of the bit(s): [HALT-BIT]

Task 4:

Skip next instruction only if AC is positive.

INP

SPA

OUT

HALT

Output:

On entering positive number:

CPU SIM

*lab

File
Edit
Modify
Execute
Help

Data
Dec

CMA(1).a ×
task4.a ×

1 **INP**
2 **SPA**
3 **OUT**
4 **HALT**
5

MAIN

Addr	Data
0	63488
1	57360
2	62464
3	57345
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0

Registers

Name	Wi...	Data
AC	16	4
AR	12	1
DR	16	0
E	1	0
I	1	0
IR	16	-8191
PC	12	4
S	1	-1

EXECUTING...
Enter Inputs, the first of which must be an Integer: 4
EXECUTION HALTED NORMALLY due to the setting of the bit(s): [HALT-BIT]

On entering negative number:

CPM *lab

File Edit Modify Execute Help

Data Dec

Registers

Name	Wi...	Data
AC	16	-3
AR	12	1
DR	16	0
E	1	0
I	1	0
IR	16	-8191
PC	12	4
S	1	-1

CMA(1).a × task4.a ×

```

1 INP
2 SPA
3 OUT
4 HALT
5

```

MAIN

Addr	Data
0	63488
1	57360
2	62464
3	57345
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0

EXECUTING...

Enter Inputs, the first of which must be an Integer: -3

Output: -3

EXECUTION HALTED NORMALLY due to the setting of the bit(s): [HALT-BIT]

Task 5:

Skip next instruction only if AC is negative.

INP

SNA

OUT

HALT

Output:

On entering negative number:

```
EXECUTING...
Enter Inputs, the first of which must be an Integer: -2
EXECUTION HALTED NORMALLY due to the setting of the bit(s): [HALT-BIT]
```

On entering positive number:

```
EXECUTING...
Enter Inputs, the first of which must be an Integer: 10
Output: 10
EXECUTION HALTED NORMALLY due to the setting of the bit(s): [HALT-BIT]
```