

Bahria University,

Karachi Campus



LAB EXPERIMENT NO.

03

LIST OF TASKS

TASK NO	OBJECTIVE
1	Write a program in which take input if input is equal to 0 then print output otherwise again take input. Hint This is used by while loop.
2	Write a program in which take input and if input is less than 10 then add otherwise terminate the program.
3	Write a program in which print table.

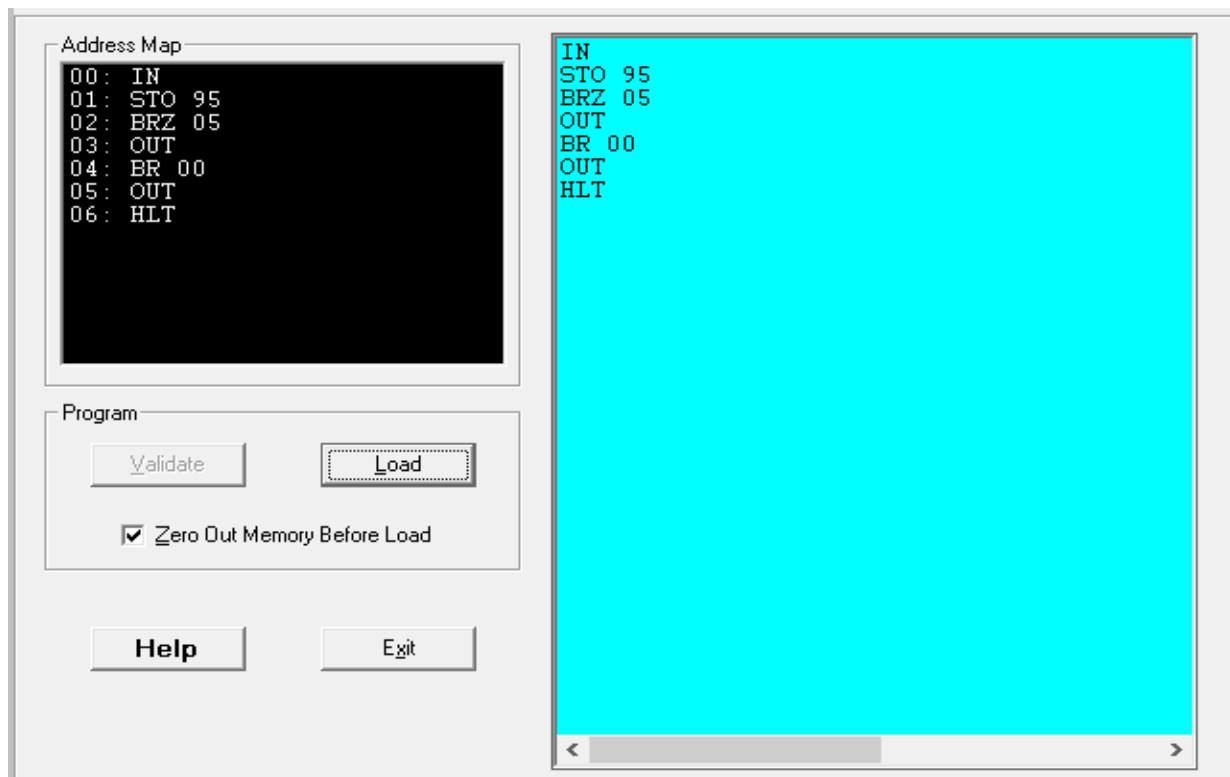
Submitted On:
Date: 17/10/2022

[Lab no : 2]**[Computer Architecture and Logic Design]**

Task No. 1: Write a program in which take input if input is equal to 0 then print output otherwise again take input. Hint This is used by while loop.

Solution:

```
IN
STO 95
BRZ 05
OUT
BR 00
OUT
HLT
```

Output:

The screenshot displays a simulation interface for a computer architecture. It is divided into three main sections:

- I/O Log:** A green window showing the execution log. The log entries are:
 - [00] Begin Run
 - [00] Input: 5
 - [03] Output: 5
 - [00] Input: 6
 - [03] Output: 6
 - [00] Input: 0
 - [05] Output: 0
 - [06] End - Normal
- Hardware View:** A cyan window showing the internal state of the processor and RAM.
 - PROCESSOR:**
 - Accum.:** 000
 - Prog. Ctr.:** 06
 - Instr. Reg.:** 0 00, HLT
 - Instruction Cycle:** 15
 - RAM:** A table showing memory contents for addresses 0 to 9.

	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9
0_	901	395	705	902	600	902	000	000	000	000
1_	000	000	000	000	000	000	000	000	000	000
2_	000	000	000	000	000	000	000	000	000	000
3_	000	000	000	000	000	000	000	000	000	000
4_	000	000	000	000	000	000	000	000	000	000
5_	000	000	000	000	000	000	000	000	000	000
6_	000	000	000	000	000	000	000	000	000	000
7_	000	000	000	000	000	000	000	000	000	000
8_	000	000	000	000	000	000	000	000	000	000
9_	000	000	000	000	000	000	000	000	000	000
- Trace View:** A grey window showing the execution trace. It includes buttons for Run, Step, Pause, Restart, and a speed slider. There are also checkboxes for Show Source Window and Tick, and buttons for Help and Return.

Task No. 2: Write a program in which take input and if input is less than 10 then add otherwise terminate the program.

Solution:

```

IN
STO 99
SUB 98
BRP 08
LDA 99
ADD 99
OUT
BR 00
HLT
*98
DAT 010
  
```

Output:

Address Map

```

00: IN
01: STO 99
02: SUB 98
03: BRP 08
04: LDA 99
05: ADD 99
06: OUT
07: BR 00
08: HLT
   *98
98: DAT 010

```

Program

Validate
Load

☒ Zero Out Memory Before Load

Help
Exit

```

IN
STO 99
SUB 98
BRP 08
LDA 99
ADD 99
OUT
BR 00
HLT
*98
DAT 010

```

I/O Log

```

[00] Begin Run
[00] Input: 5
[06] Output: 10
[00] Input: 6
[06] Output: 12
[00] Input: 10
[08] End - Normal

```

Execute

Run
Step
Pause

Restart

S speed F

☐ Show Source Window ☒ Tick

Help
Return

Hardware View
Trace View

PROCESSOR

Accum.

000

Instr. Reg.

0 00

HLT

Prog. Ctr.

08

Instruction Cycle: 21

RAM

	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9
0_	901	399	298	808	599	199	902	600	000	000
1_	000	000	000	000	000	000	000	000	000	000
2_	000	000	000	000	000	000	000	000	000	000
3_	000	000	000	000	000	000	000	000	000	000
4_	000	000	000	000	000	000	000	000	000	000
5_	000	000	000	000	000	000	000	000	000	000
6_	000	000	000	000	000	000	000	000	000	000
7_	000	000	000	000	000	000	000	000	000	000
8_	000	000	000	000	000	000	000	000	000	000
9_	000	000	000	000	000	000	000	000	010	010

Task No. 3: Write a program in which print table.**Solution:**

```
IN
STO 95
lda 97
add 96
sto 97
lda 98
add 95
sto 98
out
lda 94
sub 97
brz 13
br 02
hlt
*94
dat 010
*96
dat 001
*97
dat 000
*98
dat 000
```

Output:

Address Map

```

00: IN
01: STO 95
02: lda 97
03: add 96
04: sto 97
05: lda 98
06: add 95
07: sto 98
08: out
09: lda 94
10: sub 97
11: brz 13
12: br 02

```

Program

Validate
Load

☒ Zero Out Memory Before Load

Help
Exit

```

IN
STO 95
lda 97
add 96
sto 97
lda 98
add 95
sto 98
out
lda 94
sub 97
brz 13
br 02
hlt
*94
dat 010
*96
dat 001
*97
dat 000
*98
dat 000

```

I/O Log

```

[00] Begin Run
[00] Input: 10
[08] Output: 10
[08] Output: 20
[08] Output: 30
[08] Output: 40
[08] Output: 50
[08] Output: 60
[08] Output: 70
[08] Output: 80
[08] Output: 90
[08] Output: 100

```

Execute

Run
Step
Pause

Restart

S speed F

☐ Show Source Window ☒ Tick

Help
Return

Hardware View
Trace View

PROCESSOR

Accum.
000

Prog. Ctr.
13

Instr. Reg.
0 00
HLT

Instruction Cycle: 112

RAM

	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9
0_	901	395	597	196	397	598	195	398	902	594
1_	297	713	602	000	000	000	000	000	000	000
2_	000	000	000	000	000	000	000	000	000	000
3_	000	000	000	000	000	000	000	000	000	000
4_	000	000	000	000	000	000	000	000	000	000
5_	000	000	000	000	000	000	000	000	000	000
6_	000	000	000	000	000	000	000	000	000	000
7_	000	000	000	000	000	000	000	000	000	000
8_	000	000	000	000	000	000	000	000	000	000
9_	000	000	000	000	010	010	001	010	100	000