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SUBJECT: COAL

LAB7-TASK1:

The screenshot displays an x86-64 emulator interface. On the left, a list of assembly instructions is shown with their addresses (01 to 12):

```
01 mov ax,5
02 mov bx,2
03 mov cx,ax
04 jmp calculate
05 modify:
06 sub ax,bx
07 mov dx,ax
08 jmp finish
09 calculate:
10 add ax,bx
11 jmp modify
12 finish:
```

Below the instructions, a window titled "original source co..." shows the same assembly code, with the instruction at address 08 (`jmp finish`) highlighted in yellow.

The main emulator window, titled "emulator: noname.bin_", features a menu bar (file, math, debug, view, external, virtual devices, virtual drive, help) and a toolbar with buttons for Load, reload, step back, single step, and run. A "step delay ms: 0" slider is also present.

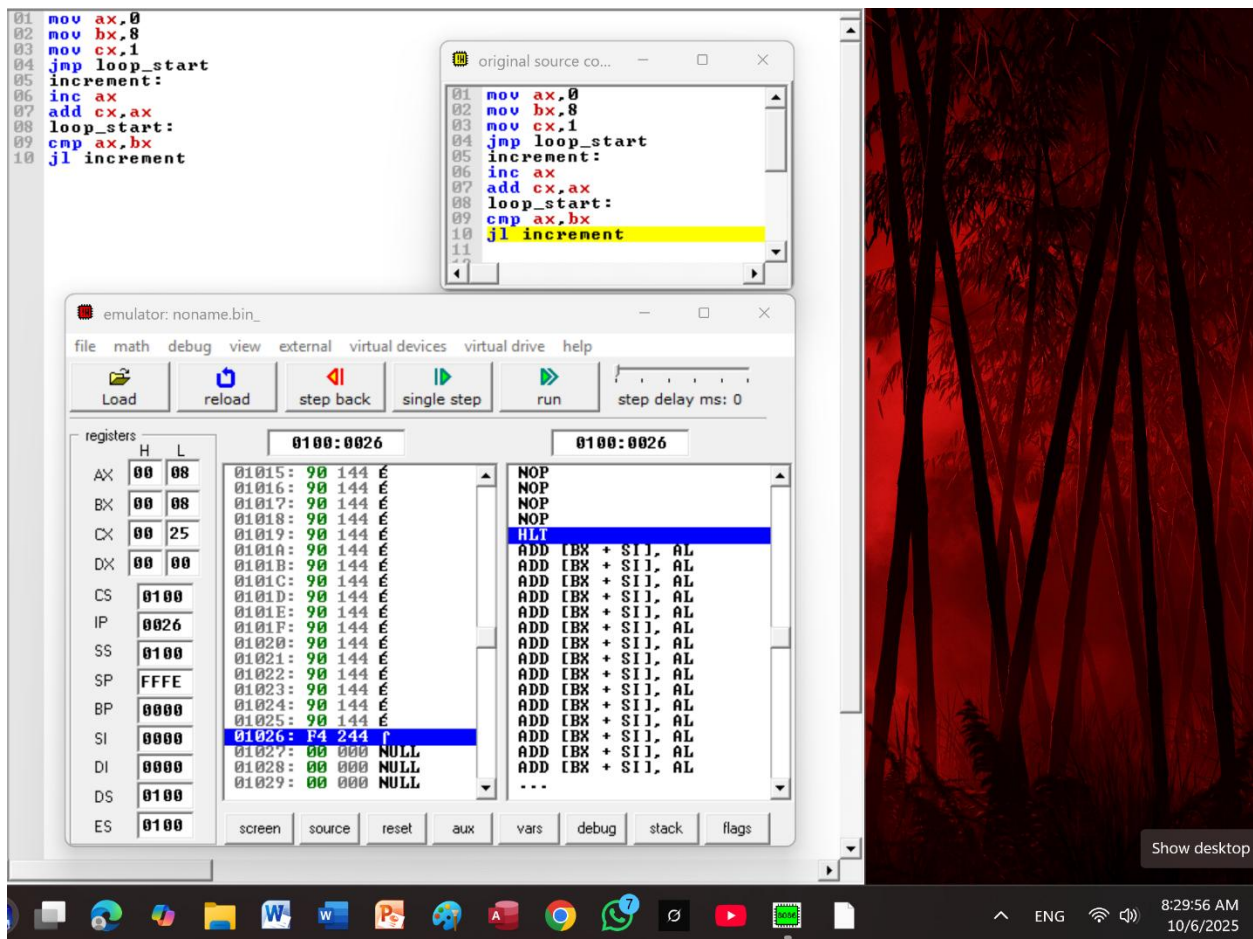
The "registers" panel on the left shows the following values:

Register	H	L
AX	00	05
BX	00	02
CX	00	05
DX	00	05
CS	0100	
IP	0028	
SS	0100	
SP	FFFE	
BP	0000	
SI	0000	
DI	0000	
DS	0100	
ES	0100	

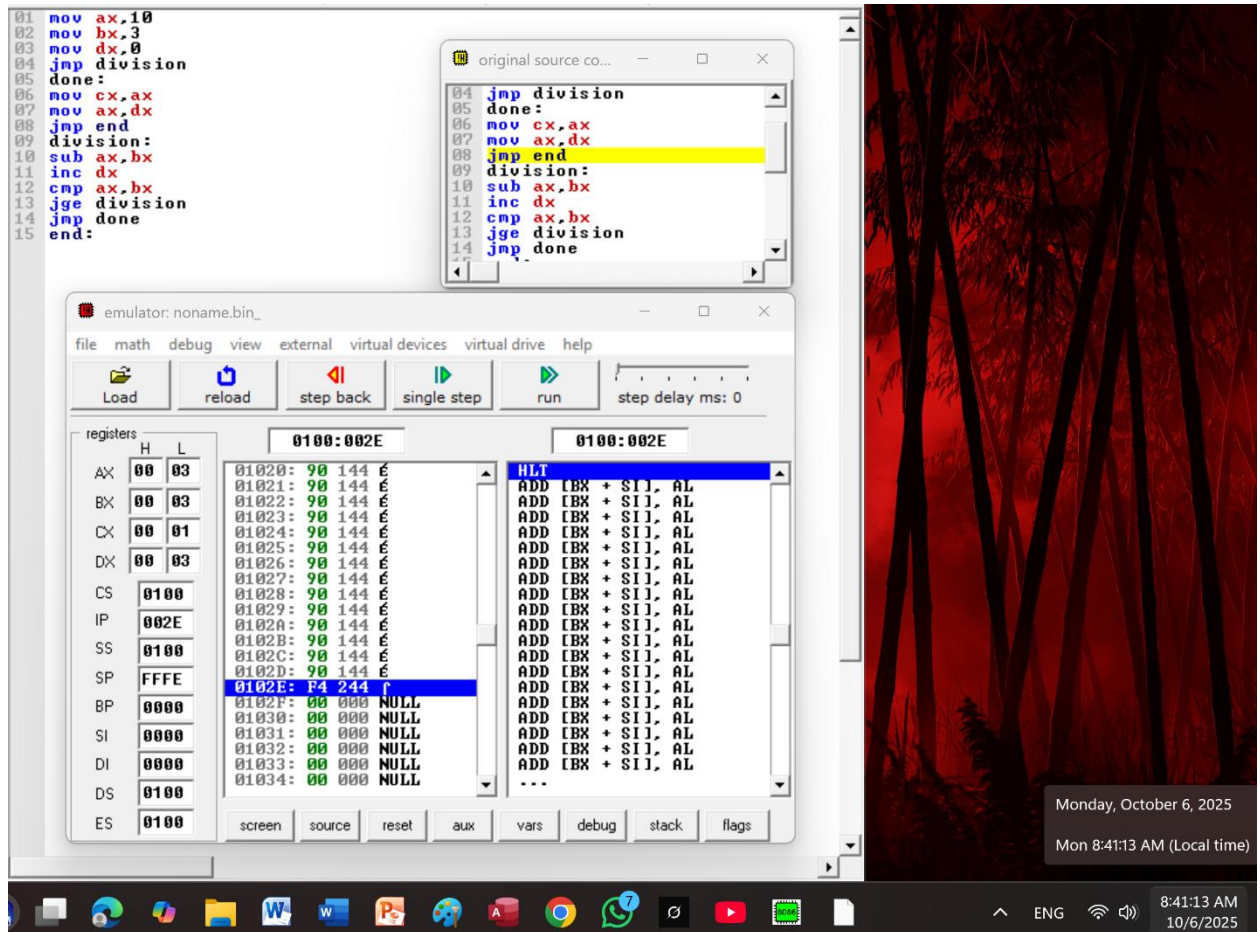
The memory dump shows two columns of data. The left column displays addresses from 01015 to 01029, with values in hexadecimal and ASCII. The right column displays the instruction at address 0100:0028, which is `HLT`.

The Windows taskbar at the bottom shows the date and time: Monday, October 6, 2025, Mon 8:24:17 AM (Local time).

TASK2:



TASK3:



The screenshot displays a Windows desktop environment with a red-themed wallpaper. In the foreground, an x86 emulator window titled "emulator: noname.bin_" is open. The assembly code is shown in a window titled "original source co...". The code is as follows:

```
01 mov ax,10
02 mov bx,3
03 jmp dx,0
04 jmp division
05 done:
06 mov cx,ax
07 mov ax,dx
08 jmp end
09 division:
10 sub ax,bx
11 inc dx
12 cmp ax,bx
13 jge division
14 jmp done
15 end:
```

The emulator's registers window shows the current state of the CPU registers. The registers are listed on the left, and the memory dump is shown on the right. The memory dump is at address 0100:002E and contains the following instructions:

Address	Disassembly
01020:	90 144 E
01021:	90 144 E
01022:	90 144 E
01023:	90 144 E
01024:	90 144 E
01025:	90 144 E
01026:	90 144 E
01027:	90 144 E
01028:	90 144 E
01029:	90 144 E
0102A:	90 144 E
0102B:	90 144 E
0102C:	90 144 E
0102D:	90 144 E
0102E:	F4 244
0102F:	00 000 NULL
01030:	00 000 NULL
01031:	00 000 NULL
01032:	00 000 NULL
01033:	00 000 NULL
01034:	00 000 NULL

The taskbar at the bottom shows the system clock as Monday, October 6, 2025, 8:41:13 AM (Local time).

TASK4:

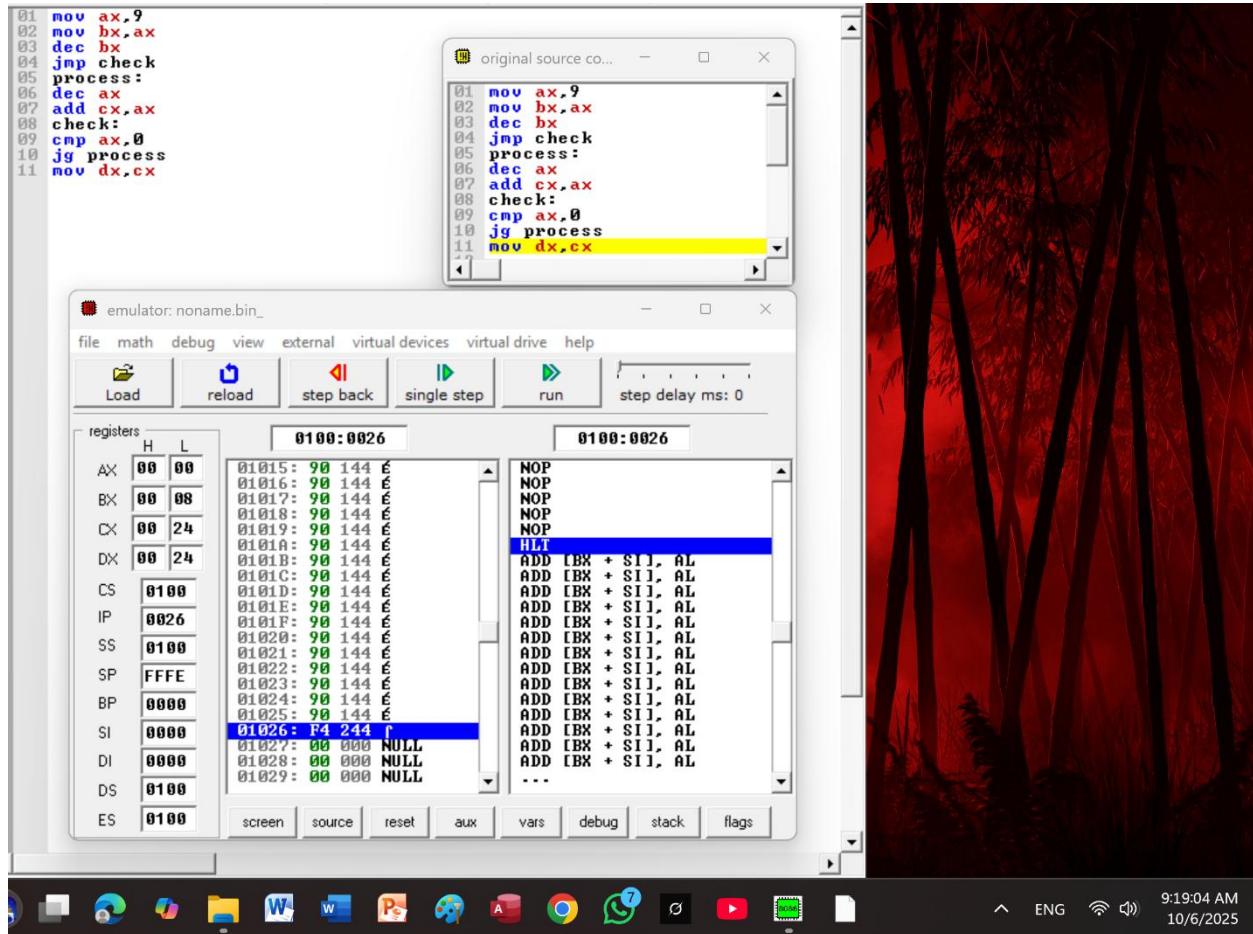
The screenshot displays an x86-64 emulator window titled "emulator: Babar_65731_T4_L7.bin_". The main window is divided into several panes:

- Registers:** A table showing the state of CPU registers. The AX register contains FF E0, BX contains 00 20, CX contains 00 00, DX contains FF E0, CS contains 0100, IP contains 002C, SS contains 0100, SP contains FFFE, BP contains 0000, SI contains 0000, DI contains 0000, DS contains 0100, and ES contains 0100.
- Memory Dump:** A table showing memory contents. The address 0100:002C is highlighted, showing the value F4 244. The memory dump also shows NULL values for addresses 0102D through 01034.
- Assembly Code:** A window titled "original source co..." showing the assembly code. The code is as follows:

```
01 mov ax, 0FFFFh
02 mov bx, 1
03 mov cx, 5
04 jmp shift_loop
05 exit:
06 mov dx, ax
07 jmp end
08 shift_loop:
09 add ax, ax
10 add bx, bx
11 dec cx
12 jnz shift_loop
13 jmp exit
14 end:
```
- Memory Dump (Right):** A table showing memory contents. The address 0100:002C is highlighted, showing the value HLT. The memory dump also shows ADD [BX + SI], AL for addresses 0102D through 01034.

The taskbar at the bottom shows various application icons, including a web browser, file explorer, and communication tools. The system clock indicates 9:10:34 AM on 10/6/2025.

TASK5:



TASK6:

The screenshot displays a DOS emulator interface with the following components:

- Assembly Code (Left):**

```
01 mov ax,0
02 mov bx,1
03 mov cx,7
04 jmp fibonacci
05 stop:
06 mov dx,bx
07 hlt
08 fibonacci:
09 mov si,ax
10 mov ax,bx
11 add bx,si
12 dec cx
13 jnz fibonacci
14 jmp stop
15
16
```
- Original Source Code (Top Right):**

```
04 jmp fibonacci
05 stop:
06 mov dx,bx
07 hlt
08 fibonacci:
09 mov si,ax
10 mov ax,bx
11 add bx,si
12 dec cx
13 jnz fibonacci
14 jmp stop
```
- Emulator Window (Bottom):**
 - Registers:**

	H	L
AX	00	00
BX	00	15
CX	00	00
DX	00	15
CS	0100	
IP	0000	
SS	0100	
SP	FFFE	
BP	0000	
SI	0008	
DI	0000	
DS	0100	
ES	0100	
 - Memory (0100:0000):**

Address	Hex	Dec	Comment
0100B	8B	139	I
0100C	D3	211	u
0100D	F4	244	I
0100E	8B	139	I
0100F	F0	240	E
01010	8B	139	I
01011	C3	195	I
01012	03	003	I
01013	DE	222	I
01014	49	073	I
01015	75	117	u
01016	F7	247	u
01017	EB	235	u
01018	F2	242	u
01019	90	144	E
0101A	90	144	E
0101B	90	144	E
0101C	90	144	E
0101D	90	144	E
0101E	90	144	E
0101F	90	144	E
 - Assembly List (Right):**

Address	Hex	Dec	Comment
0100B	8B	139	I
0100C	D3	211	u
0100D	F4	244	I
0100E	8B	139	I
0100F	F0	240	E
01010	8B	139	I
01011	C3	195	I
01012	03	003	I
01013	DE	222	I
01014	49	073	I
01015	75	117	u
01016	F7	247	u
01017	EB	235	u
01018	F2	242	u
01019	90	144	E
0101A	90	144	E
0101B	90	144	E
0101C	90	144	E
0101D	90	144	E
0101E	90	144	E
0101F	90	144	E

The taskbar at the bottom shows various application icons and the system clock: 9:36:21 AM, 10/6/2025.

TASK7:

The screenshot displays a Windows desktop environment with a dark red, forest-themed wallpaper. In the foreground, an x86 emulator window titled "emu8086" is open, showing the execution of a program. The program's source code is visible in a window titled "original source co...", and the emulator's registers and memory are shown in the main window.

Source Code (original source co...):

```
01 mov ax,00ffh
02 add al,1
03 add ah,1
04 add ax,1
05
06
```

Emulator Registers:

Register	H	L
AX	01	01
BX	00	00
CX	00	00
DX	00	00
CS	0100	
IP	001F	
SS	0100	
SP	FFFE	
BP	0000	
SI	0000	
DI	0000	
DS	0100	
ES	0100	

Emulator Memory (0100:001F):

Address	Value	Comment
01015:	90 144 E	
01016:	90 144 E	
01017:	90 144 E	
01018:	90 144 E	
01019:	90 144 E	
0101A:	90 144 E	
0101B:	90 144 E	
0101C:	90 144 E	
0101D:	90 144 E	
0101E:	90 144 E	
0101F:	E4 244 C	
01020:	00 000 NULL	
01021:	00 000 NULL	
01022:	00 000 NULL	
01023:	00 000 NULL	
01024:	00 000 NULL	
01025:	00 000 NULL	
01026:	00 000 NULL	
01027:	00 000 NULL	
01028:	00 000 NULL	
01029:	00 000 NULL	

Emulator Memory (0100:001F):

Address	Value	Comment
01015:	90 144 E	
01016:	90 144 E	
01017:	90 144 E	
01018:	90 144 E	
01019:	90 144 E	
0101A:	90 144 E	
0101B:	90 144 E	
0101C:	90 144 E	
0101D:	90 144 E	
0101E:	90 144 E	
0101F:	E4 244 C	
01020:	00 000 NULL	
01021:	00 000 NULL	
01022:	00 000 NULL	
01023:	00 000 NULL	
01024:	00 000 NULL	
01025:	00 000 NULL	
01026:	00 000 NULL	
01027:	00 000 NULL	
01028:	00 000 NULL	
01029:	00 000 NULL	

Flags:

Flag	Value
CF	0
ZF	0
SF	0
OF	0
PF	0
AF	0
IF	1
DF	0

Taskbar:

The taskbar at the bottom of the screen shows various application icons, including a file explorer, a web browser, and a terminal. The system clock in the bottom right corner indicates the time is 10:31:09 AM on 10/6/2025.

TASK8:

