CPSC 240: Computer Organization and Assembly Language Assignment 01, Fall Semester 2023

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- 1. Download the "CPSC-240 Assignment01.docx" document.
- 2. Follow the "CPSC-240 Ex01 Hello World.pdf" slide to design a "hello.asm" Assembly program and generate. "hello.o", "hello.lst", and "hello" files.
- 3. Copy and paste the "hello.asm" file into the document.
- 4. Follow the "CPSC-240 Ex01 Debugger.pdf" slide to debug the "hello" file.
- 5. When the program runs to line 12, copy and paste the "Register" window into the document.
- 6. When the program runs to line 18, copy and paste the "Register" window into the document.
- 7. When running the "x/14db &text" and "x/s &text" commands, copy and paste the "DDD" window (including the gdb panel) into the document to display the memory results.
- 8. Save the file in pdf format and submit the pdf file to Canvas before deadline.
- 9. Deadline is 23:59 pm on 09/06/2023.

[Insert hello.asm file here]

```
; ex hello.asm
; char text[] = "Hello, World!\n"
; cout << text;
section .data
        text db "Hello, World!", 10
section .text
        global _start
start:
         mov rax, 1
         mov rdi, 1
         mov rsi, text
         mov rdx, 14
         syscall
         mov rax, 60
         mov rdi, 0
         syscall
```

[Insert 1st Register window here]

Registers		
rax	0×0	0
rbx	0×0	0
LCX	0x0	0
rdx	0x0	0
rsi	0x0	0
rdi	0x0	0
rbp	0×0	0x0
rsp	0x7fffffffe220	0x7ffffffffe220
г8	0×0	0
г9	0×0	0
r10	0×0	0
г11	0×0	0
г12	0×0	0
г13	0×0	0
г14	0×0	0
г15	0×0	0
rip	0x401000	0x401000 <_start>
eflags	0x202	[IF]
cs	0x33	51
SS	0x2b	43
ds	0×0	0
es	0×0	0
fs	0x0	0
gs	0x0	0

[Insert 2nd Register window here]

eflags 0x202 [IF] cs 0x33 51 ss 0x2b 43 ds 0x0 0 es 0x0 0 fs 0x0 0	rcx rdx rsi rdi rbp rsp r8 r9 r10	0x40101e 0xe 0x402000 0x1 0x0 0x7fffffffe220 0x0	4198430 14 4202496 1 0x0 0x7fffffffe220
rdx 0xe 14 rsi 0x402000 4202496 rdi 0x1 1 rbp 0x0 0x0 rsp 0x7fffffffffe220 0x7ffffffffe220 r8 0x0 0 r9 0x0 0 r10 0x0 0 r11 0x302 770 r12 0x0 0 r13 0x0 0 r14 0x0 0 r15 0x0 0 rip 0x40101e 0x40101e <_start+30	rdx rsi rdi rbp rsp r8 r9 r10 r11	0xe 0x402000 0x1 0x0 0x7fffffffe220 0x0	14 4202496 1 0x0 0x7fffffffe220 0
rsi 0x402000 4202496 rdi 0x1 1 rbp 0x0 0x0 rsp 0x7ffffffffe220 0x7fffffffe220 r8 0x0 0 r9 0x0 0 r10 0x0 0 r11 0x302 770 r12 0x0 0 r13 0x0 0 r14 0x0 0 r15 0x0 0 rip 0x40101e 0x40101e <_start+30 eflags 0x202 [IF] cs 0x33 51 ss 0x2b 43 ds 0x0 0 es 0x0 0	rsi rdi rbp rsp r8 r9 r10	0x402000 0x1 0x0 0x7fffffffe220 0x0 0x0	4202496 1 0x0 0x7fffffffe220 0
rdi 0x1 1 rbp 0x0 0x0 rsp 0x7ffffffffe220 0x7fffffffe220 r8 0x0 0 r9 0x0 0 r10 0x0 0 r11 0x302 770 r12 0x0 0 r13 0x0 0 r14 0x0 0 r15 0x0 0 rip 0x40101e 0x40101e <_start+30 eflags 0x202 [IF] cs 0x33 51 ss 0x2b 43 ds 0x0 0 es 0x0 0	rdi rbp rsp r8 r9 r10 r11	0x1 0x0 0x7fffffffe220 0x0 0x0	1 0x0 0x7fffffffe220 0
rbp 0x0 0x0 rsp 0x7fffffffe220 0x7fffffffe220 r8 0x0 0 r9 0x0 0 r10 0x0 0 r11 0x302 770 r12 0x0 0 r13 0x0 0 r14 0x0 0 r15 0x0 0 rip 0x40101e 0x40101e <_start+30 eflags 0x202 [IF] cs 0x33 51 ss 0x2b 43 ds 0x0 0 es 0x0 0 fs 0x0 0	rbp rsp r8 r9 r10 r11	0x0 0x7fffffffe220 0x0 0x0	0x0 0x7fffffffe220 0
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r8	r8 r9 r10 r11	0×0 0×0	0
r9 0x0 0 r10 0x0 0 r11 0x302 770 r12 0x0 0 r13 0x0 0 r14 0x0 0 r15 0x0 0 rip 0x40101e 0x40101e ⟨_start+30 eflags 0x202 [IF] cs 0x33 51 ss 0x2b 43 ds 0x0 0 es 0x0 0 fs 0x0 0	r9 r10 r11	0×0	
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r13	r12	0x302	770
r14 0x0 0 r15 0x0 0 rip 0x40101e 0x40101e <_start+30 eflags 0x202 [IF] cs 0x33 51 ss 0x2b 43 ds 0x0 0 es 0x0 0 fs 0x0 0		0×0	0
r15 0x0 0 rip 0x40101e 0x40101e <_start+30 eflags 0x202 [IF] cs 0x33 51 ss 0x2b 43 ds 0x0 0 es 0x0 0 fs 0x0 0	r13	0×0	0
rip 0x40101e 0x40101e <_start+30 eflags 0x202	г14	0×0	0
eflags 0x202 [IF] cs 0x33 51 ss 0x2b 43 ds 0x0 0 es 0x0 0 fs 0x0 0	r15	0×0	0
cs 0x33 51 ss 0x2b 43 ds 0x0 0 es 0x0 0 fs 0x0 0	rip	0x40101e	0x40101e <_start+30)
ss 0x2b 43 ds 0x0 0 es 0x0 0 fs 0x0 0	eflags	0x202	[IF]
ds 0x0 0 es 0x0 0 fs 0x0 0	cs	0x33	51
es 0x0 0 fs 0x0 0	SS	0x2b	43
fs 0x0 0	ds	0×0	0
	es	0×0	0
es 0x0 0	fs	0×0	0
0-	gs	0×0	0

[Insert DDD window here]

```
💢 Applications 🛚 🐞 DDD: /home/885857847... 🗈 885857847@vclvm0113... 🪃 [Desktop - File Manager] 🏼 🧿
        File Edit Yiew Program Commands Status Source
       (): hello.asm:19
            1 ; ex_hello.asm
           2 ; char text[] = "Hello, World!\n"
3 ; cout << text;
            5 section .data
6 text of
                          text db "Hello, Horld!", 10
            8 section .text
9 global
                          global _start
10
11 _start:
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18 I
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22
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                          mov rax, 1
                          nov rdi, 1
                          mov rsi, text
mov rdx, 14
                          syscall
                          mov rax, 60 mov rdi, 0
                          syscall
```

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```
0x402000: 72 101 108 108 111 44 32 87 0x402008: 111 114 108 100 33 10 (gdb) x/s &text 0x402000: "Hello, World!\n" (gdb)
```