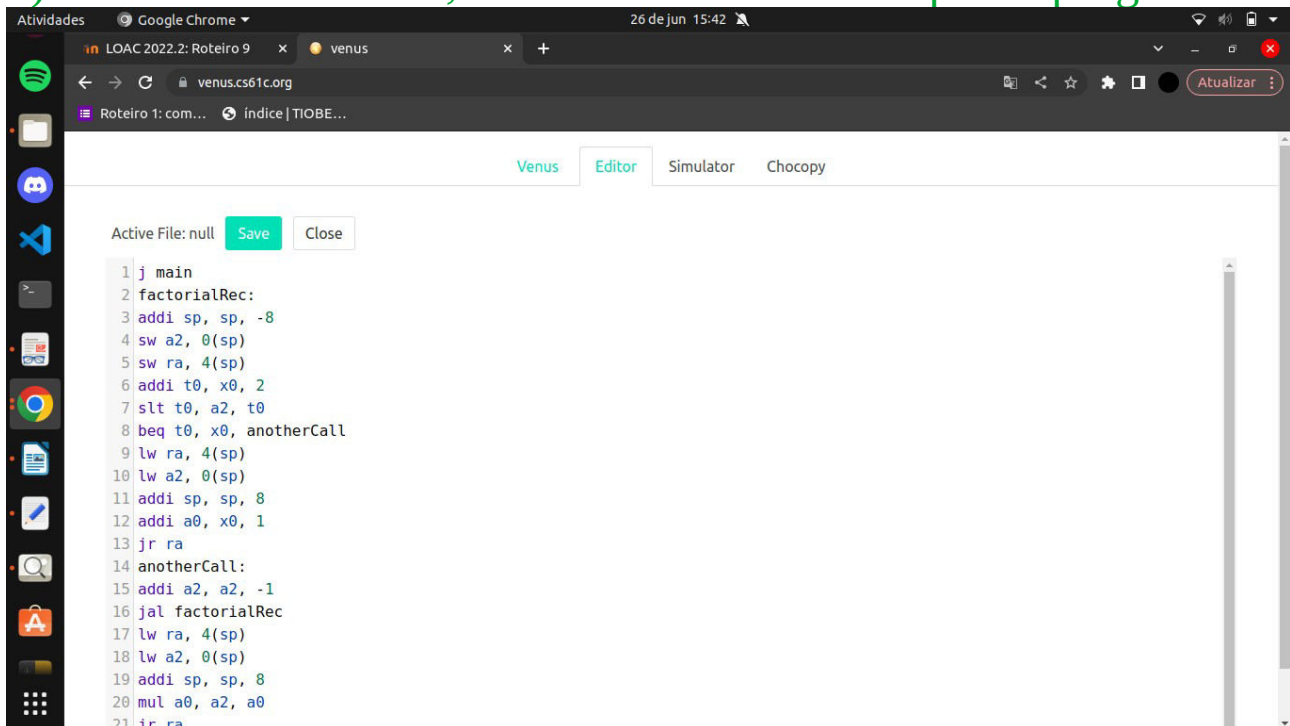
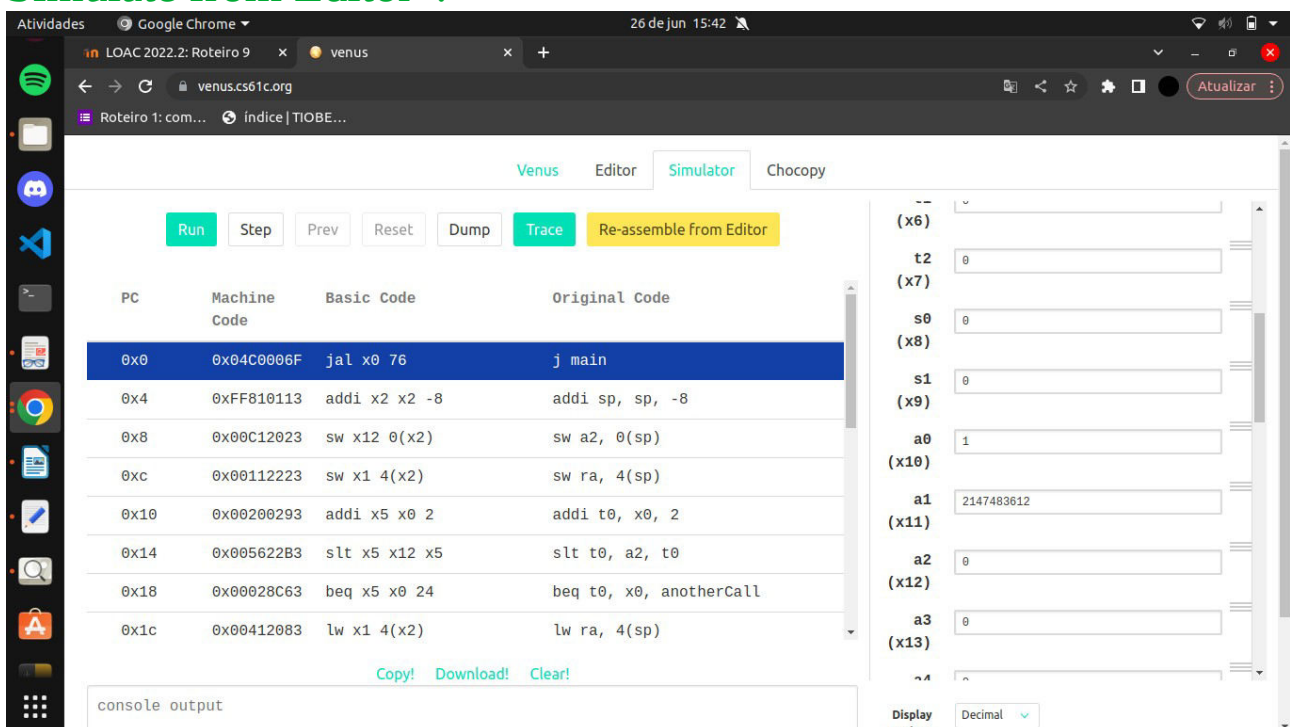


Problema 1 – Memória de Instruções

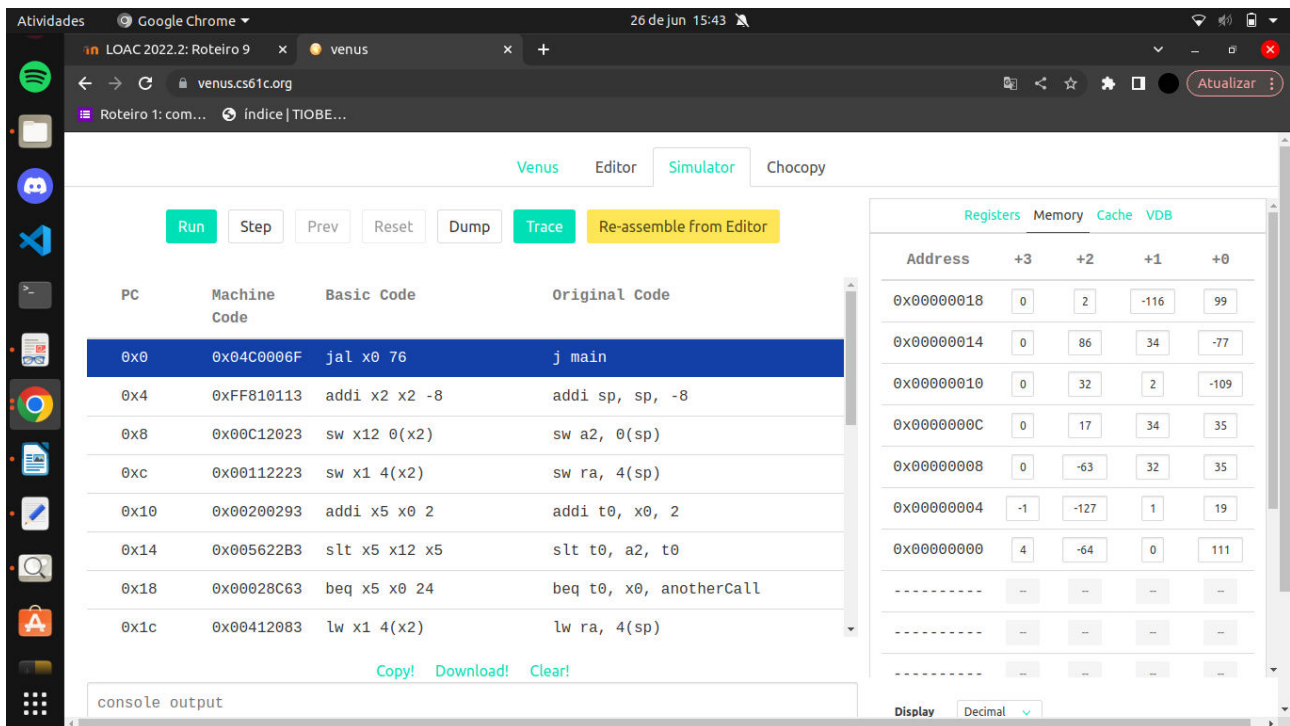
1) Acessar o simulador, selecionar “Editor” e copiar o programa.



2) Selecionar “Simulator” e pressionar o botão “Assemble & Simulate from Editor”.



3) Selecionar “Memory” e exibir o programa na Memória de Instruções.



a) Qual é o endereço de memória que aponta para a primeira instrução?

0X00000000

b) Qual é o endereço de memória que aponta para a última instrução?

0X00000050

c) Qual é o espaço de memória ocupado pelo programa (lembrete: cada endereço aponta para 1 byte)?

21 bytes

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Roteiro 1: com... Índice | TIOBE...

Venus Editor Simulator Chocopy

Run Step Prev Reset Dump Trace Re-assemble from Editor

PC	Machine Code	Basic Code	Original Code
0x0	0x04C0006F	jal x0 76	j main
0x4	0xFF810113	addi x2 x2 -8	addi sp, sp, -8
0x8	0x00C12023	sw x12 0(x2)	sw a2, 0(sp)
0xc	0x00112223	sw x1 4(x2)	sw ra, 4(sp)
0x10	0x00200293	addi x5 x0 2	addi t0, x0, 2
0x14	0x005622B3	slt x5 x12 x5	slt t0, a2, t0
0x18	0x00028C63	beq x5 x0 24	beq t0, x0, anotherCall
0x1c	0x00412083	lw x1 4(x2)	lw ra, 4(sp)

Copy! Download! Clear!

console output

(x5) t1 0 (x6) t2 0 (x7) s0 0 (x8) s1 0 (x9) a0 1 (x10) a1 2147483612 (x11) a2 0 (x12) a3 0

Display Settings Decimal

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LOAC 2022.2: Roteiro 9 x venus

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Roteiro 1: com... Índice | TIOBE...

Venus Editor Simulator Chocopy

Run Step Prev Reset Dump Trace Re-assemble from Editor

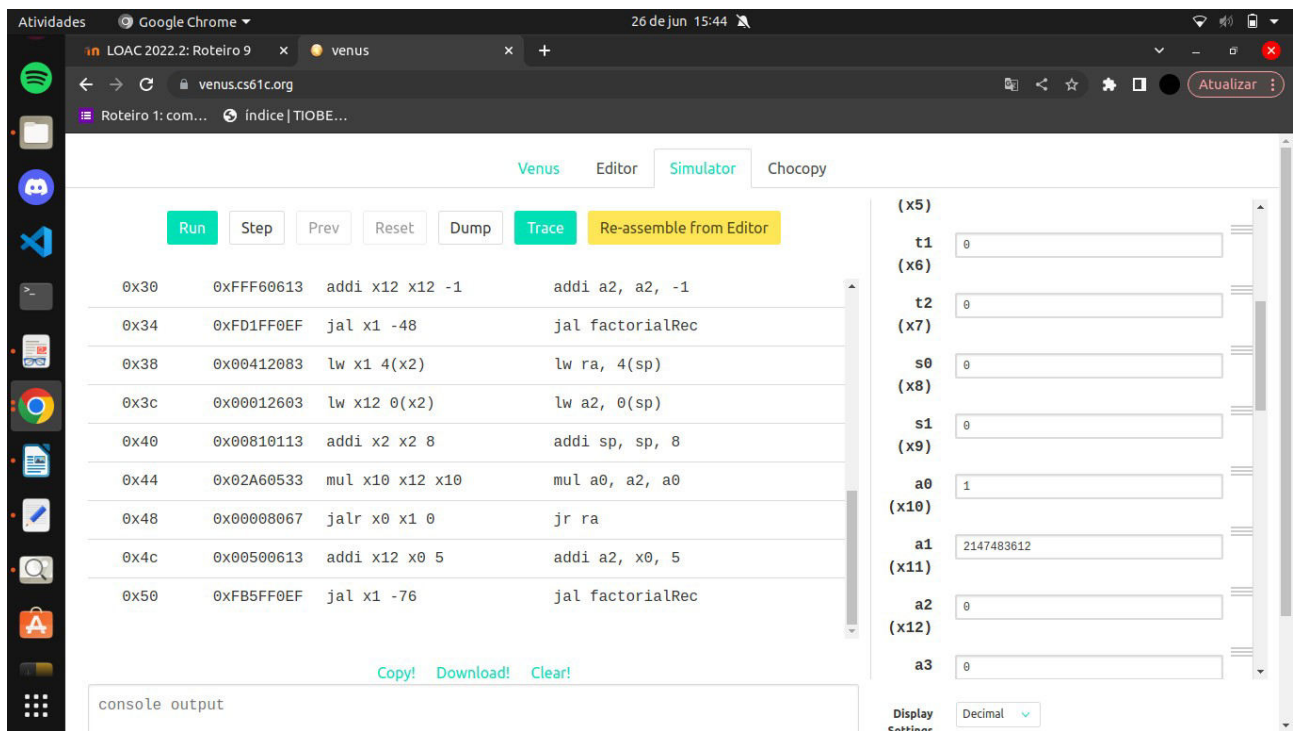
0x1c	0x00412083	lw x1 4(x2)	lw ra, 4(sp)
0x20	0x00012603	lw x12 0(x2)	lw a2, 0(sp)
0x24	0x00810113	addi x2 x2 8	addi sp, sp, 8
0x28	0x00100513	addi x10 x0 1	addi a0, x0, 1
0x2c	0x00000067	jalr x0 x1 0	jr ra
0x30	0xFFFF60613	addi x12 x12 -1	addi a2, a2, -1
0x34	0xFD1FF0EF	jal x1 -48	jal factorialRec
0x38	0x00412083	lw x1 4(x2)	lw ra, 4(sp)
0x3c	0x00012603	lw x12 0(x2)	lw a2, 0(sp)
0x40	0x00810113	addi x2 x2 8	addi sp, sp, 8

Copy! Download! Clear!

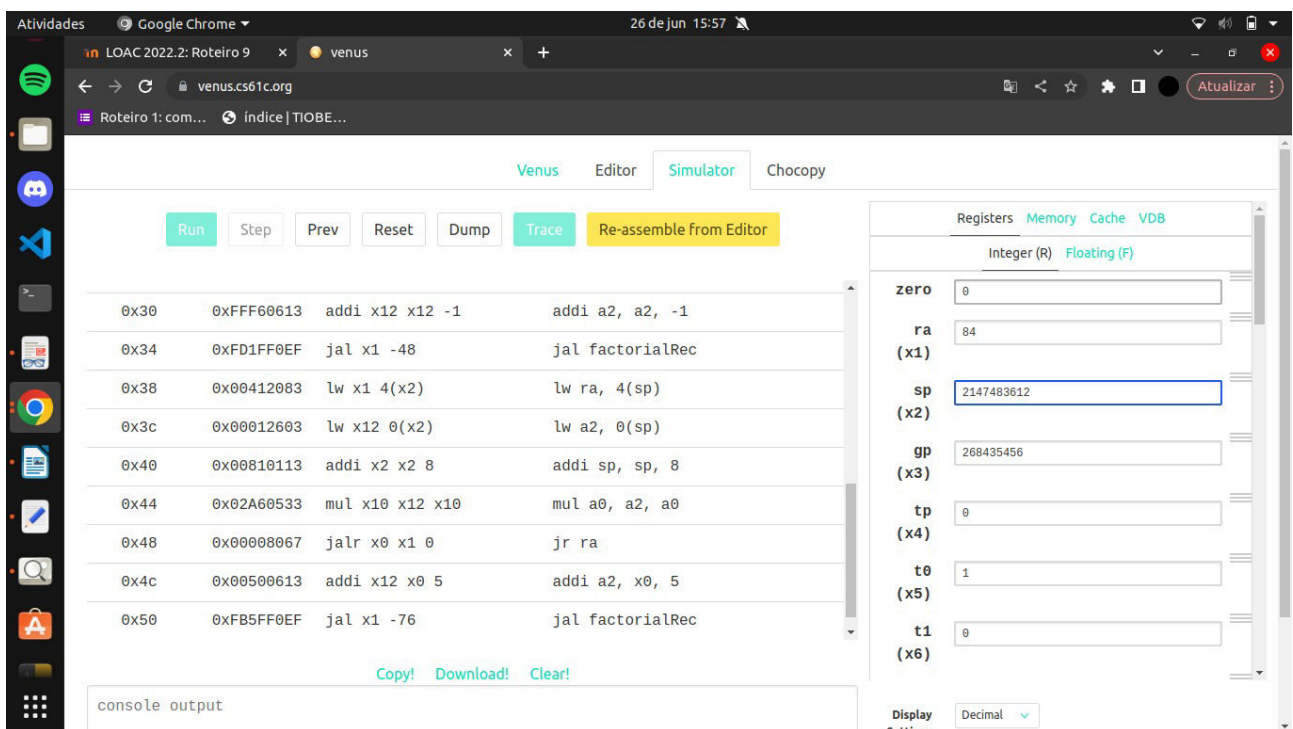
console output

(x5) t1 0 (x6) t2 0 (x7) s0 0 (x8) s1 0 (x9) a0 1 (x10) a1 2147483612 (x11) a2 0 (x12) a3 0

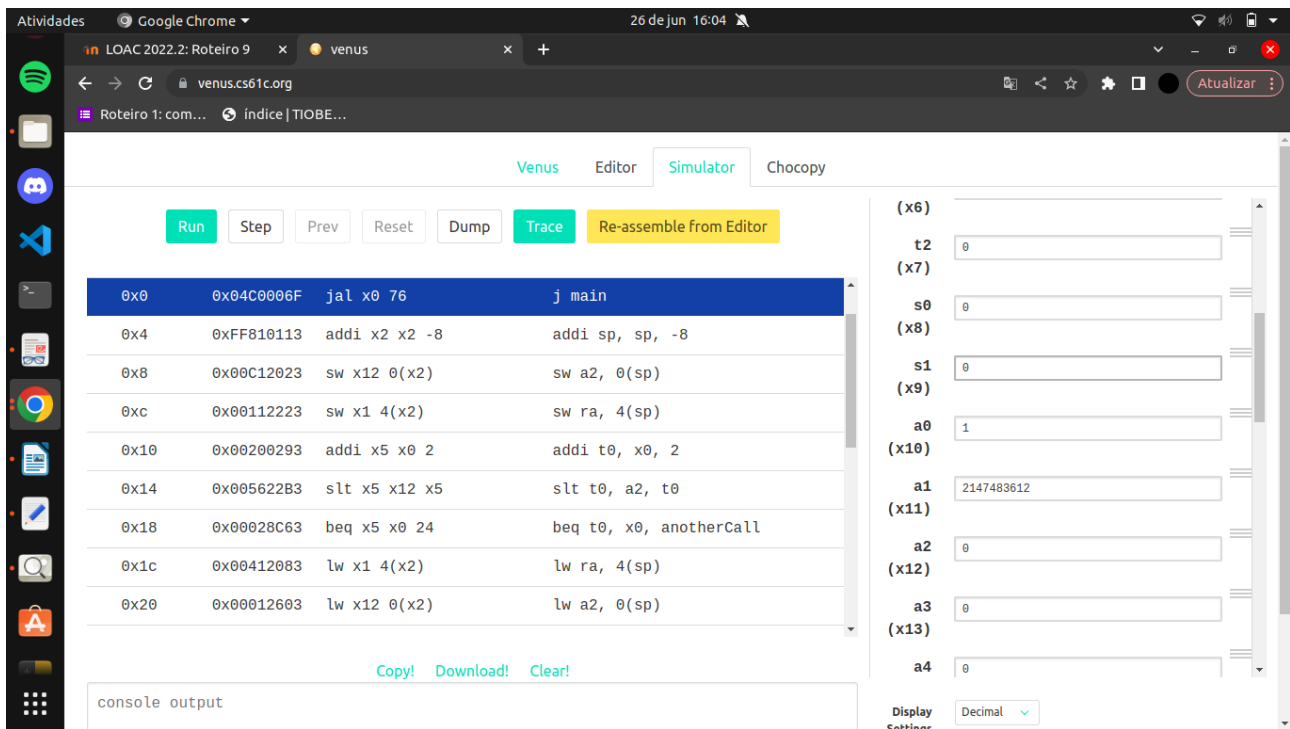
Display Settings Decimal



4) Selecionar “Registers”.

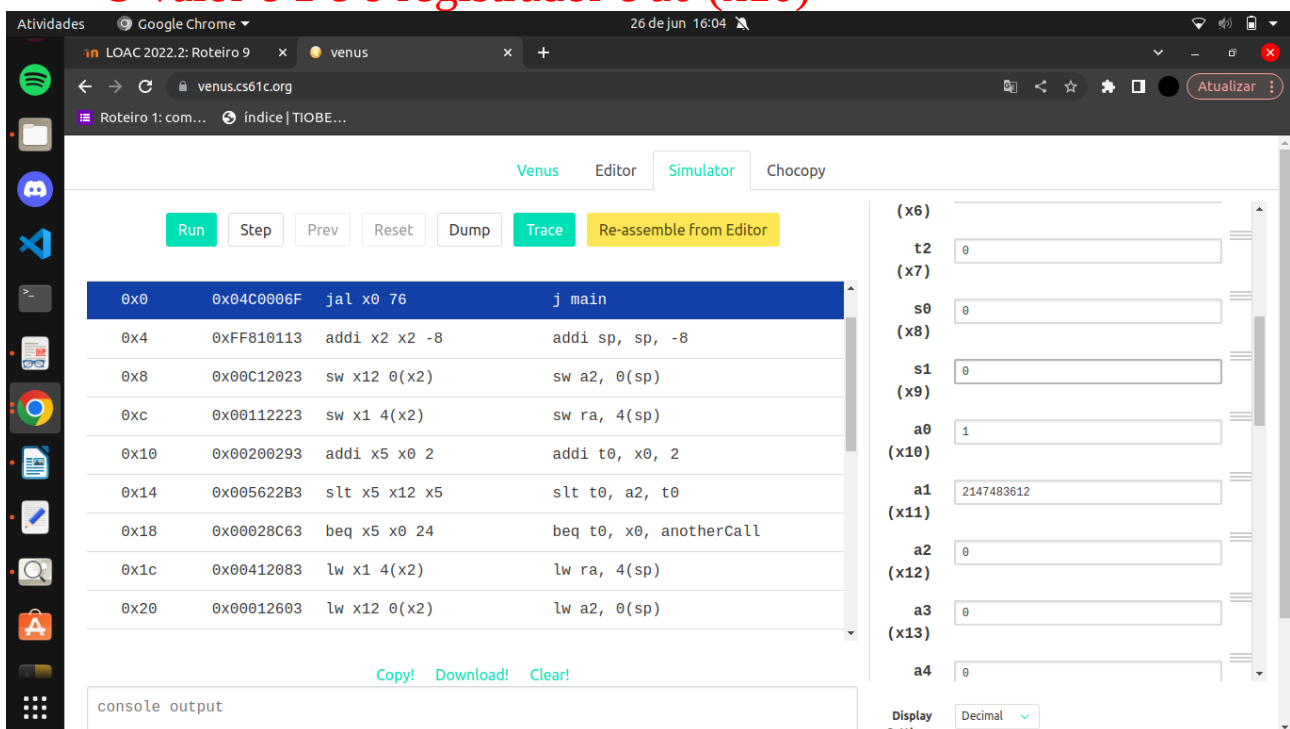


a) Qual é o conteúdo do registrador que armazena o valor de “n”?
 O valor é 0 e o registrador a2 (x12)



b) Qual é o conteúdo do registrador que armazena o valor de “factorial(n)”?

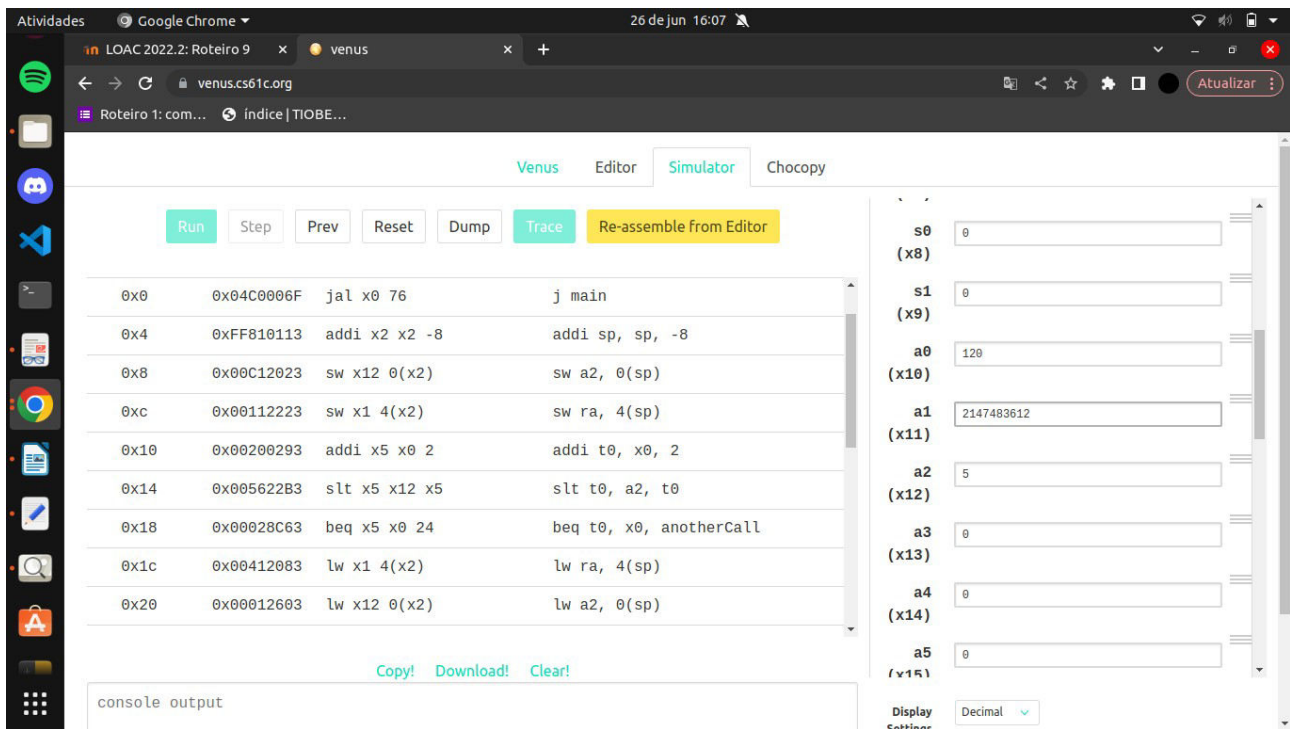
O valor é 1 e o registrador é a0 (x10)



5) Selecionar “Run” (desconsiderar qualquer mensagem de erro exibida).

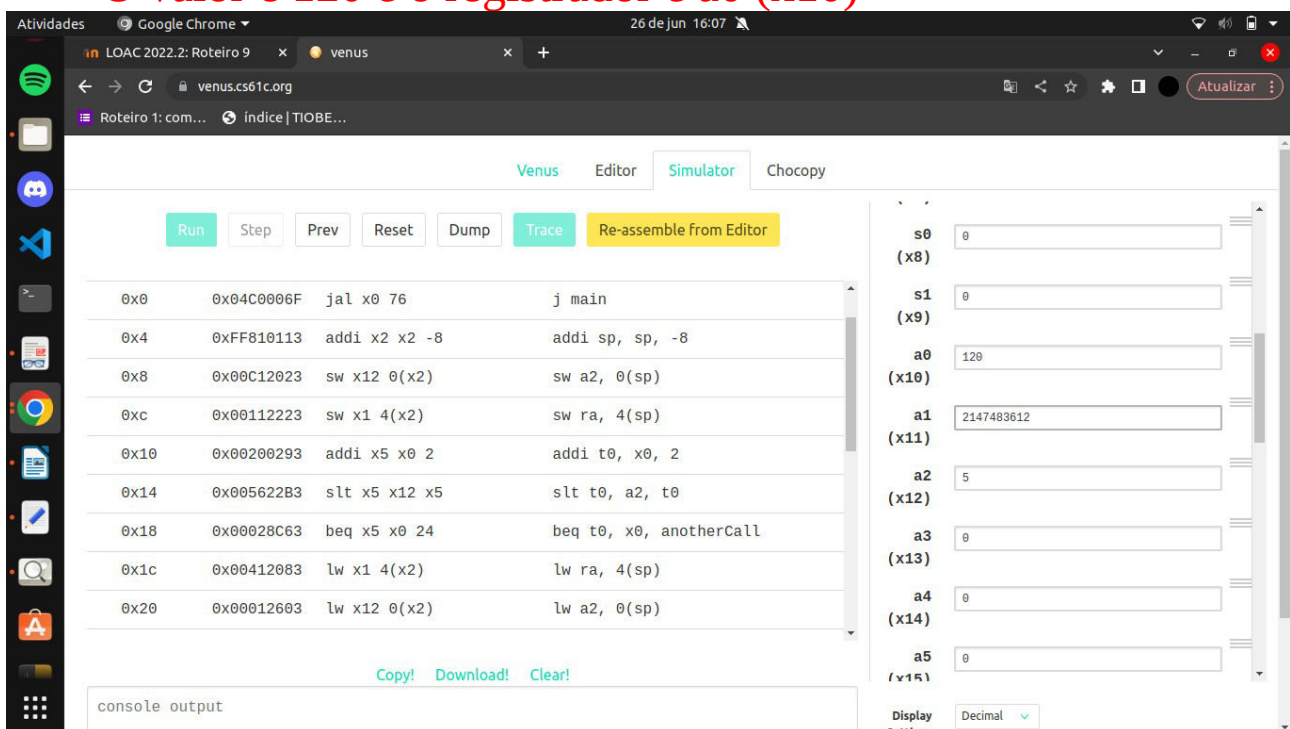
a) Qual é o conteúdo do registrador que armazena o valor de “n”?

O valor é 5 e o registrador é a2 (x12)



b) Qual é o conteúdo do registrador que armazena o valor de “factorial(n)”?

O valor é 120 e o registrador é a0 (x10)



Problema 2 – Memória Cache

1) Selecionar “Cache” e fornecer as configurações, conforme exibido na figura.

The screenshot shows the Venus simulator interface. The 'Cache' tab is selected in the right-hand panel. The configuration settings are as follows:

- Cache Levels: 1
- Block Size (Bytes): 4
- Number of Blocks: 2
- Associativity: 1
- Cache Size (Bytes): 8
- Enable?: ☒ Enables current selected level of the cache.
- Direct Mapped: ☒
- LRU: ☒ L1 ☐
- Hit Count: 0
- Display Settings: Hex ☒

The main window displays a table of assembly instructions:

PC	Machine Code	Basic Code	Original Code
0x0	0x04C0006F	jal x0 76	j main
0x4	0xFF810113	addi x2 x2 -8	addi sp, sp, -8
0x8	0x00C12023	sw x12 0(x2)	sw a2, 0(sp)
0xc	0x00112223	sw x1 4(x2)	sw ra, 4(sp)
0x10	0x00200293	addi x5 x0 2	addi t0, x0, 2
0x14	0x005622B3	slt x5 x12 x5	slt t0, a2, t0
0x18	0x00028C63	beq x5 x0 24	beq t0, x0, anotherCall
0x1c	0x00412083	lw x1 4(x2)	lw ra, 4(sp)

2) Selecionar “Run” (desconsiderar qualquer mensagem de erro exibida) e informar os valores das variáveis a seguir.

The screenshot shows the Venus simulator interface after running. The 'Cache' tab is still selected. The configuration settings are as follows:

- Cache Size (Bytes): 8
- Enable?: ☒ Enables current selected level of the cache.
- Direct Mapped: ☒
- LRU: ☒ L1 ☐
- Hit Count: 0
- Accesses: 20
- Hit Rate: 0
- Cache State:
 - 0) EMPTY
 - 1) EMPTY
- NOTE: This is a write through, write allocate cache.
- Seed: -4828345073745765928
- Display Settings: Hex ☒

The main window displays the same table of assembly instructions as in the previous screenshot.

Atividades Google Chrome 26 de jun 17:07

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Roteiro 1: com... Índice | TIOBE...

Venus Editor Simulator Chocopy

Run Step Prev Reset Dump Trace Re-assemble from Editor

PC	Machine Code	Basic Code	Original Code
0x0	0x04C0006F	jal x0 76	j main
0x4	0xFF810113	addi x2 x2 -8	addi sp, sp, -8
0x8	0x00C12023	sw x12 0(x2)	sw a2, 0(sp)
0xc	0x00112223	sw x1 4(x2)	sw ra, 4(sp)
0x10	0x00200293	addi x5 x0 2	addi t0, x0, 2
0x14	0x005622B3	slt x5 x12 x5	slt t0, a2, t0
0x18	0x00028C63	beq x5 x0 24	beq t0, x0, anotherCall
0x1c	0x00412083	lw x1 4(x2)	lw ra, 4(sp)

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console output

Cache Size (Bytes) 8

Enable? Enables current selected level of the cache.

Direct Mapped

LRU L1

Hit Count 2

Accesses 20

Hit Rate 0.1

MISS

NOTE: This is a write through, write allocate cache.

Seed -4828345073745765928

Display Settings Hex

3) Selecionar “Cache” e fornecer as configurações, conforme exibido na figura.

Atividades Google Chrome 26 de jun 17:08

LOAC 2022.2: Roteiro 9 x venus

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Roteiro 1: com... Índice | TIOBE...

Venus Editor Simulator Chocopy

Run Step Prev Reset Dump Trace Re-assemble from Editor

PC	Machine Code	Basic Code	Original Code
0x0	0x04C0006F	jal x0 76	j main
0x4	0xFF810113	addi x2 x2 -8	addi sp, sp, -8
0x8	0x00C12023	sw x12 0(x2)	sw a2, 0(sp)
0xc	0x00112223	sw x1 4(x2)	sw ra, 4(sp)
0x10	0x00200293	addi x5 x0 2	addi t0, x0, 2
0x14	0x005622B3	slt x5 x12 x5	slt t0, a2, t0
0x18	0x00028C63	beq x5 x0 24	beq t0, x0, anotherCall
0x1c	0x00412083	lw x1 4(x2)	lw ra, 4(sp)

Copy! Download! Clear!

console output

Registers Memory Cache VDB

Cache Levels 1

Block Size (Bytes) 8

Number of Blocks 2

Associativity 1

Cache Size (Bytes) 16

Enable? Enables current selected level of the cache.

Direct Mapped

LRU L1

Hit Count 0

Display Settings Hex

4) Selecionar “Re-assemble from Editor”.

5) Selecionar “Run” (desconsiderar qualquer mensagem de erro exibida) e informar os valores das variáveis a seguir. Comparando com o resultado anterior, o que é possível concluir?

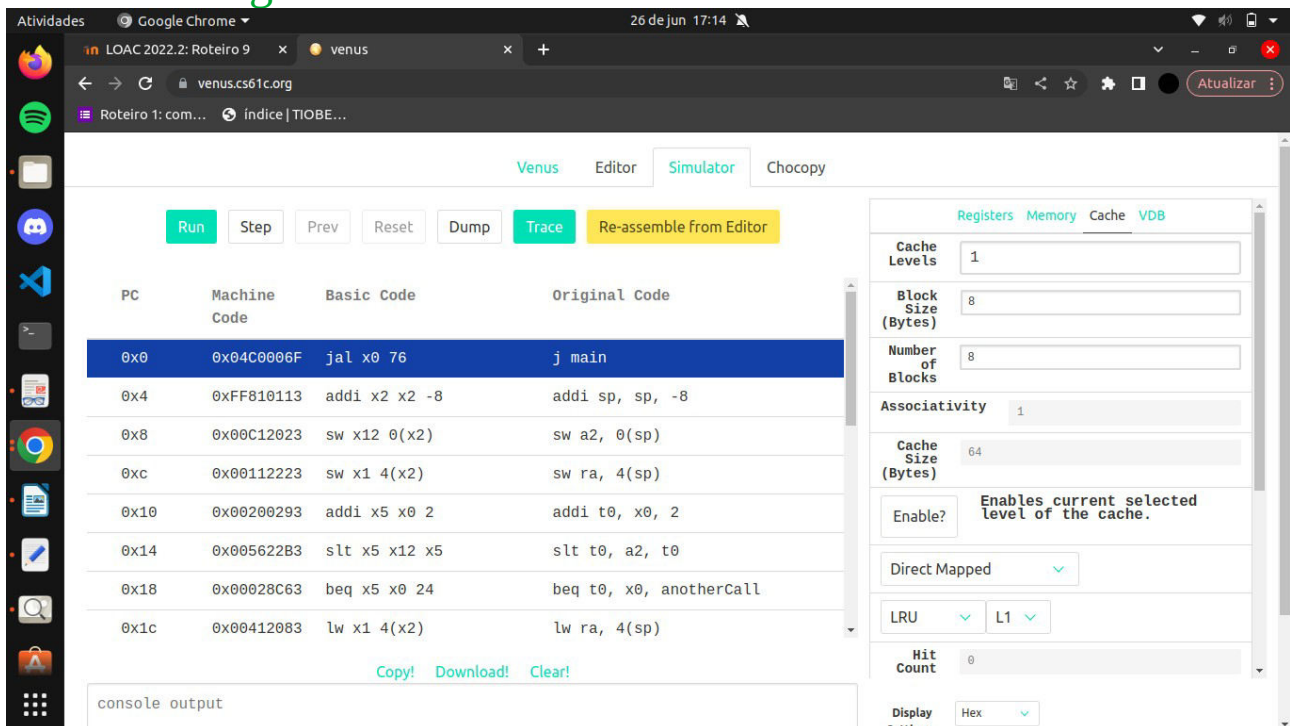
The screenshot shows the Venus simulator interface. The 'Re-assemble from Editor' button is highlighted in yellow. The main window displays a table of assembly code with columns for PC, Machine Code, Basic Code, and Original Code. The right sidebar shows cache settings, including 'Cache Size (Bytes)' set to 16, 'Associativity' set to 1, and 'Enable?' checked. The 'Hit Count' is 0 and 'Accesses' is 20.

PC	Machine Code	Basic Code	Original Code
0x0	0x04C0006F	jal x0 76	j main
0x4	0xFF810113	addi x2 x2 -8	addi sp, sp, -8
0x8	0x00C12023	sw x12 0(x2)	sw a2, 0(sp)
0xc	0x00112223	sw x1 4(x2)	sw ra, 4(sp)
0x10	0x00200293	addi x5 x0 2	addi t0, x0, 2
0x14	0x005622B3	slt x5 x12 x5	slt t0, a2, t0
0x18	0x00028C63	beq x5 x0 24	beq t0, x0, anotherCall
0x1c	0x00412083	lw x1 4(x2)	lw ra, 4(sp)

The screenshot shows the Venus simulator interface after clicking 'Run'. The 'Run' button is highlighted in green. A red error message box is displayed at the bottom right, stating 'Exited with error code 120'. The main window displays the same assembly code table. The right sidebar shows cache settings, including 'Cache Size (Bytes)' set to 16, 'Associativity' set to 1, and 'Enable?' checked. The 'Hit Count' is 10 and 'Accesses' is 20. The 'Hit Rate' is 0.5. The 'Display Settings' dropdown is set to 'Hex'.

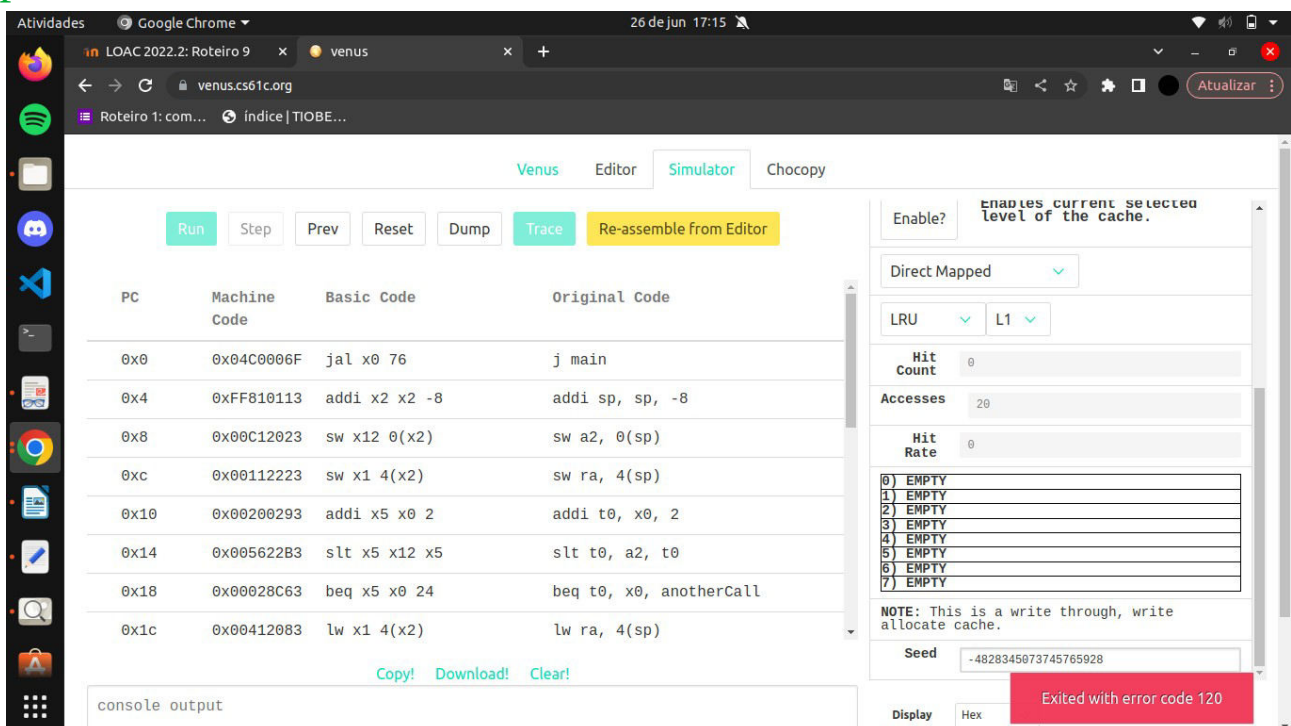
PC	Machine Code	Basic Code	Original Code
0x0	0x04C0006F	jal x0 76	j main
0x4	0xFF810113	addi x2 x2 -8	addi sp, sp, -8
0x8	0x00C12023	sw x12 0(x2)	sw a2, 0(sp)
0xc	0x00112223	sw x1 4(x2)	sw ra, 4(sp)
0x10	0x00200293	addi x5 x0 2	addi t0, x0, 2
0x14	0x005622B3	slt x5 x12 x5	slt t0, a2, t0
0x18	0x00028C63	beq x5 x0 24	beq t0, x0, anotherCall
0x1c	0x00412083	lw x1 4(x2)	lw ra, 4(sp)

6) Selecionar “Cache” e fornecer as configurações, conforme exibido na figura.



7) Selecionar “Re-assemble from Editor”.

8) Selecionar “Run” (desconsiderar qualquer mensagem de erro exibida) e informar os valores das variáveis a seguir. Comparando com o resultado anterior, o que é possível concluir?



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Roteiro 1: com... índice | TIOBE...

Venus Editor Simulator Chocopy

Run Step Prev Reset Dump Trace Re-assemble from Editor

PC	Machine Code	Basic Code	Original Code
0x0	0x04C0006F	jal x0 76	j main
0x4	0xFF810113	addi x2 x2 -8	addi sp, sp, -8
0x8	0x00C12023	sw x12 0(x2)	sw a2, 0(sp)
0xc	0x00112223	sw x1 4(x2)	sw ra, 4(sp)
0x10	0x00200293	addi x5 x0 2	addi t0, x0, 2
0x14	0x005622B3	slt x5 x12 x5	slt t0, a2, t0
0x18	0x00028C63	beq x5 x0 24	beq t0, x0, anotherCall
0x1c	0x00412083	lw x1 4(x2)	lw ra, 4(sp)

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console output

Enable? Enables current selected level of the cache.

Direct Mapped

LRU L1

Hit Count 14

Accesses 20

Hit Rate 0.7

0) HIT
1) HIT
2) HIT
3) HIT
4) EMPTY
5) EMPTY
6) HIT
7) HIT

NOTE: This is a write through, write allocate cache.

Seed -4828345073745765928

Display Hex

9) (ATIVIDADE ADICIONAL) Realizar uma análise comparativa do resultado obtido no item anterior (Mapeamento Direto) com a estratégia de Mapeamento Associativo.