

Cairo University
Faculty of Computers and artificial intelligence



CS332

Computer Architecture

And Organization

Assignment 4 – (Option 2)

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User manual

List of supported instructions:

a. **add, addi, sub, and, or, andi, ori, sll, slt, slti, lui**

Mips Simulator

Register File

| Key | Value |
|------|-------|
| \$0 | 0 |
| \$at | 4096 |
| \$v0 | |
| \$v1 | |
| \$a0 | |
| \$a1 | |
| \$a2 | |
| \$a3 | |
| \$t0 | |
| \$t1 | |
| \$t2 | |
| \$t3 | |
| \$t4 | |

Current Instruction

Program Counter

Instruction type

Text Editor

Data Segment

1- Write the Mips code here

Execute entire progr...

Validate

Execute Current

Register File

| Key | Value |
|------|-------|
| \$0 | 0 |
| \$at | 4096 |
| \$v0 | |
| \$v1 | |
| \$a0 | |
| \$a1 | |
| \$a2 | |
| \$a3 | |
| \$t0 | |
| \$t1 | |
| \$t2 | |
| \$t3 | |
| \$t4 | |

Text Editor Data Segment

```
1 addi $t0,$0,4
2
3 addi $t1,$0,10
4
5 label1:
6 addi $t0,$t0,1
7 beq $t0,$t1,label2
  j label1
label2:
```

2- Click here to validate your code and check if any syntax error occurred.

Current Instruction

Program Counter

Instruction type

Execute entire progr...

Validate

Execute Current

Register File

| Key | Value |
|------|-------|
| \$0 | 0 |
| \$at | 4096 |
| \$v0 | |
| \$v1 | |
| \$a0 | |
| \$a1 | |
| \$a2 | |
| \$a3 | |
| \$t0 | 4 |
| \$t1 | 10 |
| \$t2 | |
| \$t3 | |
| \$t4 | |

Current Instruction

addi \$t1,\$0,10

Program Counter

2

Instruction type

i

Text Editor Data Segment

```
1 addi $t0,$0,4
2
3 addi $t1,$0,10
4
5 label1:
6 addi $t0,$t0,1
7 beq $t0,$t1,label2
j label1
label2:
```

3- Choose the type of execution.

Execute current: execute the current instruction only.

Execute Entire program: execute the whole instructions.

| Opcode | rs | rt | imm | | |
|--------|-------|-------|------------------|--|--|
| 001000 | 00000 | 01001 | 0000000000001010 | | |

Execute entire progr...

Validate

Execute Current

4- See the registers content here.

Mips Simulator

Register File

| Key | Value |
|------|-------|
| \$0 | 0 |
| \$at | 4096 |
| \$v0 | |
| \$v1 | |
| \$a0 | |
| \$a1 | |
| \$a2 | |
| \$a3 | |
| \$t0 | 4 |
| \$t1 | 10 |
| \$t2 | |
| \$t3 | |
| \$t4 | |

Current Instruction

addi \$t1,\$0,10

Program Counter

2

Instruction type

i

Text Edito

Data Segment

```
1 addi $t0,$0,4
2
3 addi $t1,$0,10
4
5 label1:
6 addi $t0,$t0,1
7 beq $t0,$t1,label2
j label1
label2:
```

| Opcode | rs | rt | imm | | |
|--------|-------|-------|-------------------|--|--|
| 001000 | 00000 | 01001 | 00000000000001010 | | |

Execute entire progr...

Validate

Execute Current

Register File

| Key | Value |
|------|-------|
| \$0 | 0 |
| \$at | 4096 |
| \$v0 | |
| \$v1 | |
| \$a0 | |
| \$a1 | |
| \$a2 | |
| \$a3 | |
| \$t0 | 4 |
| \$t1 | 10 |
| \$t2 | |
| \$t3 | |
| \$t4 | |

Current Instruction

addi \$t1,\$0,10

Program Counter

2

Instruction type

i

Text Editor Data Segment

```
1 addi $t0,$0,4
2
3 addi $t1,$0,10
4
5 label1:
6 addi $t0,$t0,1
7 beq $t0,$t1,label2
j label1
label2:
```

8- The machine code of the current executed instruction.

5- The current executed instruction.

6- Program counter: represents the number of the current executed instruction

7- Instruction type

| Opcode | rs | rt | imm | | |
|--------|-------|-------|-------------------|--|--|
| 01000 | 00000 | 01001 | 00000000000001010 | | |

Execute entire progr...

Validate

Execute Current

9- Here you can see the memory and its values.

Mips Simulator

Register File

| Key | Value |
|------|-------|
| \$0 | 0 |
| \$at | 4096 |
| \$v0 | |
| \$v1 | |
| \$a0 | |
| \$a1 | |
| \$a2 | |
| \$a3 | |
| \$t0 | 4 |
| \$t1 | 10 |
| \$t2 | |
| \$t3 | |
| \$t4 | |

Current Instruction

addi \$t1,\$0,10

Program Counter

2

Instruction type

i

Text Edito

Data Segment

| Key | Value |
|------------|-------|
| 0x00001000 | |
| 0x00001004 | |
| 0x00001008 | |
| 0x0000100c | |
| 0x00001010 | |
| 0x00001014 | |
| 0x00001018 | |
| 0x0000101c | |
| 0x00001020 | |
| 0x00001024 | |
| 0x00001028 | |
| 0x0000102c | |
| 0x00001030 | |
| 0x00001034 | |
| 0x00001038 | |
| 0x0000103c | |
| 0x00001040 | |
| 0x00001044 | |
| 0x00001048 | |
| 0x0000104c | |
| 0x00001050 | |
| 0x00001054 | |

| Opcode | rs | rt | imm | | |
|--------|-------|-------|-------------------|--|--|
| 001000 | 00000 | 01001 | 00000000000001010 | | |

Execute entire progr...

Validate

Execute Current