CS2323 : HOMEWORK-2

ANSWERS:

1. addi x5, x0, 5 #Ex: x5=5

   addi x6, x0, 6 #Ex: x6=6

   addi x11, x0, 0

   addi x10, x0, 0

   Loop:

   add x10, x10, x5

   addi x11, x11, 1

   beq x11, x6, End

   beq x0, x0, Loop

   End:

   Nop

   The code initializes registers with specific values and then enters a loop where it repeatedly adds 5 (stored in x5) to a running total in x10. This loop runs 6 times, controlled by a counter in x11, which increments with each iteration until it equals 6 (x6). Once the loop completes, the program exits.

2. Loop:

   bge x12, x11, Exit

   slli x15, x13, 2

   add x16, x14, x15

   lw x17, 0(x16)

   beq x17, x0, Exit

   bge x0, x17, Else

   mv x11, x17

   beq x0, x0, UpdateIndex

   Else:

   add x11, x11, x17

   UpdateIndex:

   addi x13, x13, 2

beq x0, x0, Loop

Exit:

Nop

The code loops until a certain condition is met, comparing values in registers. It calculates the memory address using x13, loads a word from memory, and checks if the value is zero or negative. If zero, it exits; if negative, it updates x11 by adding the value from memory. Otherwise, it sets x11 to the loaded value. The index (x13) is incremented by 2, and the loop repeats. If the loop ends, it exits.

3. .data

.dword 0xa55aa5a593933939

.dword 0x39933939a55aa5a5

.text

lui x1, 0x10000

main:

lhu x3, 0(x1)

- 0x0000000000003939
- Loads 16 bit unsigned half word from address 0x10000000 into x3

lh x3, 0(x1)

- 0x0000000000003939
- Loads 16 bit signed half word from address 0x10000000 into x3 with sign extension.

lh x3, 2(x1)

- 0xffffffffffff9393
- Loads 16 bit signed half word from address 0x10000002 into x3 and extends the sign bit.

ld x3, 0(x1)

- 0xa55aa5a593933939
- Loads 64 bit double word from address 0x10000000 into x3

lw x3, 12(x1)

- 0x0000000039933939
- Loads the 32 bit word from address 0x1000000C into x3 with zero extension.

lbu x3, 7(x1)

- 0x00000000000000a5
- Loads the 8 bit unsigned byte from address 0x10000007 into x3 with zero extension.

lb x3, 7(x1)

- 0xffffffffffffffa5
- Loads the 8 bit signed byte from address 0x10000007 into x3 with sign extension.

lb x3, 6(x1)

- 0x000000000000005a
- Loads the 8 bit signed byte from address 0x10000006 into x3 with sign extension.

ld x3, 3(x1)

- 0xffffffffffffff93
- Loads the 64 bit double word from address 0x10000003 into x3. This is not aligned as the address of double word is usually a multiple of 8, but it is not in this case.

lwu x3, 6(x1)

- 0x00000000a5a5a55a
- Loads the 32 bit unsigned word from address 0x10000006 into x3 with zero extension.