CMPU-224 Lab4 Quiz Solutions

Spring 2025

Name: _____

This is a closed book, closed notes quiz. No electronic devices are allowed. You have until 3:30pm to complete the quiz. There are a total of 8 questions and 10 points.

There should be enough space on the quiz for your answers. If you need more space to work out a problem, blank paper will be available, just ask.

Good Luck!

1. (3 points) You are given the following dump of memory below. The format of the memory dump is `<address>:<value>`. For example, the byte at memory address `0x6c5` is `0xbe` and the byte at memory address `0x6da` is `0xfa`.

```
6c0:9d 6c1:f6 6c2:d5 6c3:4f 6c4:f3 6c5:be 6c6:e3 6c7:03 6c8:51 6c9:7f 6ca:c8 6cb:61 6cc:ca 6cd:77 6ce:2e 6cf:11
6d0:a6 6d1:a1 6d2:99 6d3:1e 6d4:92 6d5:b2 6d6:a8 6d7:08 6d8:9e 6d9:34 6da:fa 6db:5f 6dc:e8 6dd:09 6de:21 6df:57
6e0:66 6e1:26 6e2:7d 6e3:4e 6e4:d9 6e5:73 6e6:12 6e7:76 6e8:4d 6e9:b0 6ea:8f 6eb:23 6ec:64 6ed:46 6ee:80 6ef:62
6f0:fd 6f1:63 6f2:2f 6f3:5d 6f4:72 6f5:18 6f6:0a 6f7:37 6f8:b1 6f9:cd 6fa:74 6fb:93 6fc:56 6fd:0f 6fe:ee 6ff:4a
700:47 701:28 702:c1 703:15 704:e5 705:3d 706:24 707:43 708:dd 709:6b 70a:79 70b:0b 70c:00 70d:c4 70e:ab 70f:ff
710:53 711:40 712:6a 713:ce 714:3c 715:91 716:db 717:60 718:07 719:b8 71a:3b 71b:cf 71c:8d 71d:0e 71e:71 71f:87
720:1a 721:90 722:3f 723:68 724:bb 725:e6 726:06 727:a7 728:b7 729:95 72a:fe 72b:f9 72c:fc 72d:e9 72e:fb 72f:14
730:e2 731:f5 732:52 733:44 734:82 735:c3 736:41 737:6e 738:31 739:81 73a:86 73b:d0 73c:50 73d:33 73e:0d 73f:f0
740:1d 741:98 742:1c 743:b3 744:b4 745:67 746:a3 747:9a 748:c0 749:84 74a:b5 74b:1f 74c:1b 74d:f7 74e:85 74f:af
750:da 751:69 752:dc 753:6d 754:d4 755:5a 756:a0 757:5c 758:05 759:16 75a:e1 75b:88 75c:d6 75d:65 75e:10 75f:e0
```

What are the values of the following expressions below? **Give your answers in hexadecimal**.

Expression	**Value**
Little-endian **`char`** at address **`0x6fd`**	0x**`0f`**
Big-endian **`char`** at address **`0x6d4`**	0x**`92`**
Little-endian **`short`** at address **`0x72e`**	0x**`14fb`**
Big-endian **`short`** at address **`0x73a`**	0x**`86d0`**
Little-endian **`int`** at address **`0x728`**	0x**`f9fe95b7`**
Big-endian **`int`** at address **`0x738`**	0x**`318186d0`**

2. (1 point) What is the value in `a0` after execution? Give your answer in **hexadecimal**. You do not need to put any leading zeros in your answer.

```
1    li   t0, -4
2    srai a0, t0, 1
3
```

Solution: Value: 0xFFFFFFFE (-2 decimal)

3. (1 point) What is the value in `a0` after execution? Give your answer in **hexadecimal**. You do not need to put any leading zeros in your answer.

```
1    li   t0, 0x12345678
2    li   t1, 0x0000FFFF
3    and  a0, t0, t1
4
```

Solution: Value: 0x5678

4. (1 point) What is the value in `a0` after execution? Give your answer in **hexadecimal**. You do not need to put any leading zeros in your answer.

```
1    li   t0, 3
2    slli t1, t0, 2
3    add  a0, t1, t0
4
```

Solution: Value: 0xF (15 decimal. This mimics "mul a0, t0, 5")

5. (1 point) What is the value in `a0` after execution? Give your answer in **hexadecimal**. You do not need to put any leading zeros in your answer.

```
1    lui  a0, 0x2
2    srli a0, a0, 12
3
```

Solution: Value: 0x2

6. (1 point) What is the value in `a0` after execution? Give your answer in **hexadecimal**. You do not need to put any leading zeros in your answer.

```
1    li   t0, 0x12345678
2    xor  a0, t0, t0
3    addi a0, a0, 10
4
```

Solution: Value: 0xA

7. (1 point) What is the value in `a0` after execution? Give your answer in **hexadecimal**. You do not need to put any leading zeros in your answer.

```
1    li   t0, 0x000000FF
2    xori a0, t0, -1
3
```

Solution: Value: 0xFFFFFF00

8. (1 point) What is the value in `a0` after execution? Give your answer in **hexadecimal**. You do not need to put any leading zeros in your answer. **Note:** I have given you the values for `t0` and `a0` in the comments.

```
1     lui   t0,0x11
2     addi  t0,t0,180 # 0x110b4 in t0
3     lui   a0,0x1020
4     addi  a0,a0,772 # 0x1020304 in a0
5     sw    a0,0(t0)
6     lh    a0,0(t0)
7
```

Solution: Value: 0x304