CSCE 211 Chapter 1 Homework Sep 01 2022

You must show all your work! Answers without supporting work will not be given credit. Write answers in spaces provided. Illegible work falls under the ***Intended Purpose*** policy.

You must upload your submission as a SINGLE PDF DOCUMENT. Multiple file submissions or files of any other type will not be accepted.

This assignment is worth 2.0/21.0 (≈ 9.5%) of Problem Assignment points

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1. Convert the following as indicated: (0.4 points)

   (a) 01011101_2 to a decimal integer.

1+0+4+8+16+0+64
1+12+80

Answer: 93

(b) 10110101_2 to a hexadecimal integer.

1011-0101
11-5

Answer: B5

(c) $\boldsymbol{FE}_{16}$ to an 8-bit unsigned binary integer.

F = 15_{10} = 1111
E = 14_{10} = 1110

11111110

Answer: 11111110

Cont.

(d) 178_{10} to an 8-bit unsigned binary integer.

256

178-128
=
50

64

50-32
=
18

18-16=2

8
4
2-2=0

1

Answer: 010110010

Cont.

2. Compute the 4-bit binary sum of the following 4-bit unsigned binary integers. Provide the base-10 result as well. Do allow values to overflow—that is do not add bits in excess of the 4 bits. Additionally, provide decimal(base$_{10}$) integer values [1]: (0.4 points)

   (a) 0101 + 1001

```
0101
1001
-------
1110 = 14
```

Answer: 1110 (14_{10})

   (b) 1011 + 0101

```
1011
0101
------
0000
```

Answer: 0000 (0_{10})

[1] Take into account overflow. Do not tell me that 15 + 15 = 30. I know you know that.

Cont.

3. Convert the following to 8-bit two' s complement-encoded binary integers and perform the indicated operations. Provide your results in 8-bit binary: (0.4 points)

   (a) $7F_{16} - 6E_{16}$

7F=01111111
-6E=01101110
6E=10010001

01111111
10010001

00000000

Answer: 00000000

   (b) $-30_{10} - 22_{10}$

-30=00011110
30=11100001
-22=00010110
22=11101001

11100001
11101001

00001010

Answer: 00001010

Cont.

4. For each of the following, show their conversion to binary coded decimals (BCD) as 8421-code: (0.4 points)

   (a) 572_{10}

5 = 0101
7 = 0111
2 = 0010

Answer: 010101110010

   (b) 213_4

2 = 10
1 = 01
3 = 11

Answer: 100111

Cont.

5. Decode the two following 8-bit binary strings into ASCII characters[2] characters: (0.4 points)

(a) 01000011 01010000 01010000

C P P

Answer: CPP

(b) 01000011 01010011 01000011 01000101 00110100 01001101 01000101

C S C E 4 M E

Answer: CSCE4ME

[2]You may use the 7-bit ASCII from the book, but do keep in mind ASCII values, like all values in a computer, are 8-bits in size.

The End.