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TCSS 371 : Homework 1

1. 1. Binary: **01111111111**

Decimal: 1+2+4+8+16+32+64+128+256+512 = **1023**

* 1. Binary: **10000000000**

Decimal: -211-1 = **-1024**

1. 1. 1011 +

1001

**10100 = 20 (decimal)**

* 1. 1111 +

1101

**11100 = 28 (decimal)**

1. 1. 445 -> hex

445 = 110111101 (bin, no need for 2’s complement, not negative)

1101 = D

1011 = B

1 = 1

**445 = x1BD**

* 1. -999 -> hex

999 = 1111100111

2’s comp: 110000011001

1100 = C

0001 = 1

1001 = 9

**-999 = xC19**

5.

1. 1111 + (15)

0111 (7)

**1 01 1 0** **overflow (18 does not equal 22)**

1. 1001 – (9)

0011 (3)

**0110 (6)**

1. 0111 + (7)

0110 (6)

**1 1 0 1 (13)**

6.

Unsigned binary is positive, therefore the 1 and 2’s complement is the same.

|  |  |
| --- | --- |
|  | x354E5A21 |
| Unsigned Binary | 0011 0101 0100 1110 0101 1010 0010 0001 |
| 1’s Complement | 0011 0101 0100 1110 0101 1010 0010 0001 |
| 2’s Complement | 0011 0101 0100 1110 0101 1010 0010 0001 |
| ASCII String | 5NZ! |

Unsigned binary is positive, therefore the 1 and 2’s complement is the same.

|  |  |
| --- | --- |
|  | x24243550 |
| Unsigned Binary | 0010 0100 0010 0100 0011 0101 0101 0000 |
| 1’s Complement | 0010 0100 0010 0100 0011 0101 0101 0000 |
| 2’s Complement | 0010 0100 0010 0100 0011 0101 0101 0000 |
| ASCII String | $$5P |

7.

a. 1 10000000 10001000000000000000000

Sign = 1 (-)

Exponent = 10000000 (128)

Fraction = 10001000000000000000000 (.25)

N = -1.53125 \* 2^(128-127) = -1.53125 \* 2^1 = -1. 53125 \* 2 = **-3.0625**

1. 1.25

x – 127 = 127

x = 0

2^0 = 1

Exponent = 01111111 (127)

Fraction = 01000000000000000000000 (.25)

**0 01111111 01000000000000000000000**