

COMP2121 Tutorial 1: Numbers and Arithmetic Revision

1. Convert the following numbers from the original base to the specified base:

a) $123_{10} \rightarrow \underline{\hspace{2cm}}_2$

b) $10101_2 \rightarrow \underline{\hspace{2cm}}_{10}$

c) $1084_{10} \rightarrow \underline{\hspace{2cm}}_{16}$

d) $A5_{16} \rightarrow \underline{\hspace{2cm}}_{10}$

e) $11001001_2 \rightarrow \underline{\hspace{2cm}}_{16}$

f) $2D5_{16} \rightarrow \underline{\hspace{2cm}}_2$

2. What is the result of the following calculations?

a) $1395 + 4988$ (base 16)

b) $11001001 + 00101101$ (base 2)

c) $A41 - 560$ (base 16)

d) $11001 - 011$ (base 2)

4. What number does 10010010 represent as an unsigned number? What does it represent in 2's complement notation?

5. In 2's complement addition, $11011011 + 01100000 = 00111011$. Was there a 2's complement overflow? Why? What do the values in this sum represent?

6. What is the difference between performing 2's complement addition and unsigned addition in the AVR processor?

7. Represent the following numbers in IEEE 754 32-bit floating point notation:

a) 1.5

b) 1084

c) -1

d) -13.75

8. What does the following IEEE 754 FP number represent:

0	1000 0001	110 0000 0000 0000 0000 0000
Sign	Exponent	Mantissa