COMPUTER SCIENCE 110

**INTRODUCTION TO COMPUTER SCIENCE**

**HOMEWORK 1, Part II (Python Music)**

# Spring 2023

**Assigned**: Wednesday, 1/25 **Due**: Wednesday, 2/1, at beginning of class

BD14710_

**Part II (27 points) Number Bases (*show your work for full credit*).**

1. Convert the following **sign-magnitude** numbers from binary to decimal (base 10) (6 pts.).

i. 0011011011   219

ii. 10101110110  -374

iii. 11000111   -71

1. Copy the following chart and complete it with equivalent values in each cell.  For example, for the first line, convert the number from decimal to binary and then to hexadecimal and octal.  **Do not use sign-magnitude notation.** (12 pts.):

|  |  |  |  |
| --- | --- | --- | --- |
| Base 10 | Base 2 | Base 16 | Base 8 |
| **129** | 10000001 | 81 | 201 |
| 94 | **1011110** | 5E | 136 |
| 195 | 11000011 | **C3** | 303 |
| 490 | 111101010 | 1EA | **752** |

1. What is the range of **sign-magnitude** decimal values that can be represented using
2. four bits?

-7 to 7

1. five bits?

-15 to 15

1. six bits?

-31 to 31

1. three bytes (not bits!)?

-8388607 to 8388607

Express your answers by showing the lowest and the highest values possible, in **base 10.  Do not express your answer using exponentiation, though you may find that useful as an intermediate solution** (9 pts.).

**TURNING IT IN: Submit your solutions on Canvas (can be photos of handwritten solutions if you like)**

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