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Introduction to Computing for the Social Sciences

Theory Exercise Sheet for Session 02

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**Exercise 1: Tricked dice**

Consider a tricked 8-sided dice such that the probability of results is the following:

1: 1/10, 2: 1/10, 3: 1/10, 4:1/10, 5:1/10, 6: 1/10, 7: 1/5, 8: 1/5

a) Write a diagram with yes/no questions to determine the result of the roll of the dice.

b) Based your diagram, how many questions on average will you need to ask to know the result of the roll?

c) Based on your diagram, encode in binary the sequence of results: 11823

**Exercise 2: Convert the following numbers to octal notation**

a) 11011112

b) 1016

c) 56710

**Exercise 3: IEEE 754**

Encode the number 33.1 using simple-precision IEEE 754 Floating-point standard. *(Note: this 32-bit standard has 8 bits for the exponent and a bias of 127)*

