

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: $1/5$

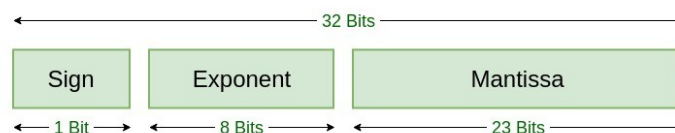
- Write a diagram with yes/no questions to determine the result of the roll of the dice.
- Based your diagram, how many questions on average will you need to ask to know the result of the roll?
- Based on your diagram, encode in binary the sequence of results: 11823

Exercise 2: Convert the following numbers to octal notation

- 1101111_2
- 10_{16}
- 567_{10}

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)



Single Precision
IEEE 754 Floating-Point Standard