CS 92 USACO

Silver Division

Unit 1: Basic Graph Theory

LECTURE 3: ORDERED FRACTIONS

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Objectives

- Ordered Fractions

Practice: Ordered Fractions

SECTION 2

Problem Statement

- Consider the set of all reduced fractions between 0 and 1 inclusive with denominators less than or equal to N.
- Here is the set when N = 5:
- 0/1 1/5 1/4 1/3 2/5 1/2 3/5 2/3 3/4 4/5 1/1
- Write a program that, given an integer N between 1 and 160 inclusive, prints the fractions in order of increasing magnitude.

INPUT FORMAT (frac1.in):

- One line with a single integer N.

SAMPLE INPUT:

5

OUTPUT FORMAT (frac1.out):

- One fraction per line, sorted in order of magnitude.

SAMPLE OUTPUT:

```
0/1
1/5
1/4
1/3
2/5
1/2
3/5
2/3
3/4
4/5
1/1
```

Nature of the Problem

- Prime Number Factorization, GCD, Fraction Reduction
- 2-D Traversal
- Sorting on the 2-tuple data struct