Intro Practice Problems

These are similar in style to competitive programming problems, but are simpler and don't use any trickiness or hard algorithms.

A warmup to get practice with problem solving in Python.

Quadratic Formula

A tiny exercise to review Python syntax.

Write a function that implements the quadratic formula in Python. For simplicity, just do plus, not plus or minus.

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Questions to ask yourself:

- What parameters should the function take?

FizzBuzz

Output the numbers from 1 to 100, one per line, except:

- If the number is divisble by 3, instead output "Fizz"
- If the number is divisible by 5, instead output "Buzz"
- If the number is divisible by 3 and divisible by 5, instead output "FizzBuzz"

Odd numbers

Functions:

- `is_odd(x: int) -> bool`
- `print_odds(n: int)`
  - Print out all the odd positive integers less than or equal to `n`.

First write the code for the functions, then write the code for reading input and calling the `print_odds` function.

Examples:

Input:

```
5
```

Output:

```
1
3
5
```

Input:

```
8
```

Output:

```
1
3
5
7
```

Integer division algorithm

Freebie.

TODO: Introduce pseudocode.

Factoring

Now try to write some pseudocode yourself.

(harder) Print out a multiplication table

Print out a 12 x 12 multiplication table using for loops.

Output:

```
1 2 3 4 5 6 7 8 9 10 11 12
2 4 6 8 10 12 14 16 18 20 22 24
...
12 24 36 48 60 72 84 96 108 120 132 144
```

Extension: Add a function parameter `n` and print out $n \times n$ table, so can support multiple different table sizes with one function.