1 Streams

1.1   (a) What are the advantages or disadvantages of using a stream over a linked list?

    (b) What's the maximum size of a stream?

    (c) What's stored in `first` and `rest`? What are their types?

    (d) When is the next element actually calculated?

1.2   What would Python display? Include the number of times the rest needs to be computed for each part.

    (a)
```
>>> a = make_integer_stream()
>>> a
```

    (b)
```
>>> a.first
```

    (c)
```
>>> a.rest
```

    (d)
```
>>> a.rest
```

    (e)
```
>>> a.rest.rest.rest
```

    (f)
```
>>> a.rest.rest
```

    (g)
```
>>> a.rest.rest.rest.rest.first
```

1.3   Implement `double_naturals`, which returns a stream that evaluates to the sequence
$1, 1, 2, 2, 3, 3, \ldots$

```python
def double_naturals(first=1, double=True):
    """
    >>> a = double_naturals()
    >>> a.first
    1
    >>> a.rest.rest.first
    2
    """
    def compute_rest():




    return Stream(first, compute_rest)
```

1.4   Implement `interleave`, which returns a stream that alternates between the values
in `stream1` and `stream2`. Assume that the streams are infinitely long.

```python
def interleave(stream1, stream2):
    """
    >>> s1, s2 = make_integer_stream(1), make_integer_stream(10)
    >>> mixed = interleave(s1, s2)
    >>> mixed.first
    1
    >>> mixed.rest.first
    10
    >>> very_mixed = interleave(mixed, mixed)
    >>> very_mixed.first
    1
    >>> very_mixed.rest.first
    1
    >>> very_mixed.rest.rest.first
    10
    >>> very_mixed.rest.rest.rest.first
    10
    """
```

2 SQL

Name	Food	Color	Editor	Language
Tiffany	Thai	Purple	Notepad++	Java
Diana	Pie	Green	Sublime	Java
Allan	Sushi	Orange	Emacs	Ruby
Alfonso	Tacos	Blue	Vim	Python
Kelly	Ramen	Green	Vim	Python

2.1 Create a new table `mentors` that contains all the information above. (You only have to write out the first two rows.)
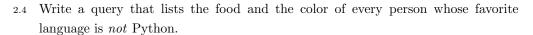
2.2 Write a query that has the same data, but alphabetizes the rows by name. (Hint: Use **order by**.)

```
Alfonso|Tacos|Blue|Vim|Python
Allan|Sushi|Orange|Emacs|Ruby
Diana|Pie|Green|Sublime|Java
Kelly|Ramen|Green|Vim|Python
Tiffany|Thai|Purple|Notepad++|Java
```

2.3 Write a query that lists all the mentors along with their favorite food if their favorite color is green.

```
Diana|Pie
Kelly|Ramen
```

2.4   Write a query that lists the food and the color of every person whose favorite language is *not* Python.

```
Sushi|Orange
Pie|Green
Thai|Purple
```

2.5   Write a query that lists all the pairs of mentors who like the same language. (How can we make sure to remove duplicates?)

```
Kelly|Alfonso
Tiffany|Diana
```