COMP 4958: Lab 3

1. (a) The sine series is given by

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + ...$$

   Use a function from the `Stream` module to implement a function `sin_terms` that returns a stream consisting of the terms in the above sine series, i.e, the terms are x, $-\frac{x^3}{3!}$, $\frac{x^5}{5!}$, $-\frac{x^7}{7!}$, $\cdots$.

   (b) Find an approximate value of the sine of 1 (radian) by summing the first 10 terms of the above stream.

2. Find the size of the largest set of 7-digit primes that are permutations of one another. (You did something similar in COMP3958.) Use the `primes` function to find the primes. The list of 7-digit primes is also provided in the file `7-digit-primes.txt` in case you cannot use the `primes` function. In that case, you will need to figure out how to read them into your program.

3. Implement a registered database server in a module named `Mydb`. `Mydb` should export at least the following functions:

```
Mydb.start() => :ok
Mydb.stop() => :ok
Mydb.store(key, value) => :ok
Mydb.find(key) => {:ok, value} | {:error, :not_found}.
Mydb.match(value) => [key1, ..., keyN].
```

   Implement this using message passing & a map.