Using this struct definition:

```c
struct number_properties
{
    int number;
    bool prime, perfect, square, triangular;
};
```

Create an array of 100,001 of these structs and set the appropriate values (we create 100,001 because we want to go up to 100,000 and we don’t care about 0). The design of the program is left to you, but you should probably write some functions!

For instance, if we create `number_properties np[100001];` then the values for `np[6]` will be set as follows:

```c
np[6].number = 6
np[6].prime = false
np[6].perfect = true
np[6].square = false
np[6].triangular = true
```

Following the population of the array, output the count of the number of primes, perfect numbers, square numbers, and triangular numbers for the following ranges (inclusive):

1 to 100000
1 to 10000
1 to 20000
10001 to 20000
1 to 50000
50001 to 100000

For example your output should look something like this (these numbers are not correct, but this is how your result should be formatted)

Range 1 to 100000:
   5000 prime numbers
   8 perfect numbers
   100 square numbers
   85 triangular numbers

Range 1 to 10000:
   ...

etc.

Note: You will turn in the paper copy for this assignment during your final exam.