Problems for Labs 1, 2 (Week 1)

1. Given an integer find the number of digits in the integer.

2. Given two integers find the reverse sum of the two integers. That is reverse each integer and then add the two reversed integers. Note that leading 0s are not relevant when an integer is reversed. So, 210 and 21 have the same reversed form 12.

3. Given a positive integer find the sum of all all proper divisors of the intger. A proper divisor is all positive divisors m that are less than n. So, n itself is excluded.

4. Given a positive integer say whether it is prime or not.

5. Given a positive integer say whether it is a perfect number or not. A perfect number is one which is equal to the sum of its proper divisors. For example, $6 = 1 + 2 + 3$, $28 = 1 + 2 + 4 + 7 + 14$.

6. Generate the first m primes, where m is read as input from the user.

7. A user selects a positive integer between 1 and 10000. You have to guess the chosen integer (say n) by asking questions like - Is $n < x$ or $n > x$ or $n = x$?

   The user will enter 1 if the answer is yes and 0 if the answer is no. Obviously, if you ask Is $n = x$ for each x from 1 to 10000 you can get an answer.

   But that is 10000 questions in the worst case. You have to do it efficiently. You can ask no more than 14 questions.

   This problem is currently not on the judge.