Problems

We will build on the program to identify prime numbers in Homework 5.

A Palindromic prime is a prime number, which is a palindrome. For example, 131 is a palindromic prime. Other examples are 313 and 757.

An Emirp (Prime spelled backwards) is a non-palindromic prime whose reversal is also a prime. For example, 17 is prime and 71 is prime also. Thus, 17 and 71 are emirps.

Twin primes are a pair of primes that differ by 2. For example, 3 and 5 are twin primes.

What to do

• Write a program with several methods to accomplish the tasks given below. For each task make sure the program can be tested by entering values in response to prompts on the console.

• Main Method: The main method will ask for two positive integers, a smaller one and a larger one. Keep these values between 1 and 10,000. It will make sure that the numbers are entered in such a way. If not, it will ask for the numbers again. This will allow us to test the same way as well.

• Method No. 2: It prints all the prime numbers within the range. If there are too may of these, it prints the first 50 primes.

• Method No. 3: It prints all the palindromic prime numbers within the range. If there are too many, it prints the first 20.

• Method No. 4: It prints all the twin primes within the range. If there are too many, it prints the first 20 pairs.

• Method No. 5: It prints all the emirps within the range. If there are too many, it prints the first 20 pairs.
What to hand in


1. Have a title to your writeup. Make sure you include your name as an author. Have a section for each of the problems.

2. Write one or more paragraphs describing your approach to solving each problem in its own subsection.

3. Please take one or more screenshots of your console, to give us an idea of what your program accomplishes. You should include the screenshots with your write-up. Describe it briefly so we understand what it contains.

4. Run your program at least 5 times with different inputs and provide the results that the program returns in a table.

5. Upload the Java program to Blackboard.

6. Please hand in a printed copy of your writeup along with the program.