Program 2: Math Calculator

Sample I/O:

Binary Converter:

Sample Input:

9 1 0 1 1 1 0 0 0 1

3 2 1 0

6 1 0 1 0 1 1

8 1 1 0 0 0 0 1 1

Sample Output:  
The decimal value of the binary number 101110001 is 369.  
The decimal value of the binary number 2 is Invalid binary number.  
The decimal value of the binary number 101011 is 43.  
The decimal value of the binary number 11000011 is 195.  
The Sum of the valid numbers is 607.  
The average of the valid numbers is 202.33.

Prime Test:

Sample Input:

7  
5  
10  
100  
90  
31  
71  
80  
69  
68  
96  
1213

Sample output:

The primes in the list are:

7  
5  
31  
71  
1213

There are 5 primes in the list.

Variable List:

Input objects:

* int option: integer data type variable that represents the option the user picks to use the binary converter or the prime number test
* int digit: integer data type variable that represents the number of digits to be read after it in the infile of the binary converter part of the program
* int binary: integer data type that stores the value of binary digits pulled into the program from the input file. Will also be used in a loop to check for valid data. I.e. if a number that is not 1 or 0 is entered, it would lead to an “invalid” message.
* int num: integer data type variable that stores the value of a number taken from the infile for the prime test option (this goes for all numbers in that part of the infile)

Output objects:

* int binNum: integer data type variable that outputs the full binary number taken and processed from the input file to the output on the screen.
* int decimal: integer data type variable that outputs the value of the binary number in base 10 (decimal) form
* int decimalSum: integer data type that outputs the sum of all decimal numbers found from each valid binary number
* float decimalAvg: float data type that outputs the average of all decimal numbers found from valid binary numbers (decimalSum / decimalCount)
* int prime: integer data type that is used to store the value of prime numbers taken from the infile and analyzed as a prime number
* int primeCount: integer data type that outputs the number of prime numbers found from the input given from the infile.

Other objects:

* int binaryCount: integer data type variable that stores the count of how many binary digits have been counted. to be compared to digit in a loop to count the correct amount of digits in the line of input from the file for the binary converter option
* void sum: void, non-value returning function that will be used to calculate the sum of all decimal numbers passed by reference for the binary converter option
* void average: void function/ non-value returning function that will be used to calculate the average of decimal numbers passed by reference for the binary converter option
* int decimalCount: integer data type that stores the number of decimal values calculated from all valid binary numbers entered from the infile for the binary converter option
* void testPrime: void function that tests whether or not a number is a prime number
* void numPrime: void function that counts how many prime numbers were found in the infile