wordStats

Language/Type: C++ basics streams file input
Related Links: string istream

Write a function named **wordStats** that accepts as its parameter a string holding a file name, opens that file and reads its contents as a sequence of words, and produces a particular group of statistics about the input. You should report the total number of words (as an integer), the average word length (as an un-rounded real number), and the number of unique letters used from A-Z, case-insensitively. For example, suppose the file `tobe.txt` contains the following text:

```
To be  or not  TO BE,    THAT IS   the question.
```

For the purposes of this problem, we will use whitespace to separate words. That means that some words include punctuation, as in "be,". For the input above, your function should produce exactly the following output. The number of "unique letters" is 12 because the file contains 12 distinct letters of the alphabet from A-Z: a, b, e, h, i, n, o, q, r, s, t, and u. So the call of `wordStats("tobe.txt");` would produce the following console output:

```
Total words    = 10
Average length = 3.2
Unique letters = 12
```

If the input file does not exist or is not readable, your function should instead print the following output:

```
Error, bad input file.
```

Constraints: Your solution should read the file only once, not make multiple passes over the file data.

. . .

```
1  void wordStats(string filename){
2
3      ifstream input( filename );
4      string line;
5
6      size_t totalNumOfWords = 0;
7      double totalLenOfWords = 0;
8
9      string token;
10     char charInWord;
11     string unique = "";
12     cout << endl;
13         if ( !input.is_open() ) {
14             cout << "Error, bad input file." << endl;
15         } else {
```

```
16
17              while ( true ) {
18                  input >> token;
19                  if( input ) {
20                      totalNumOfWords++;
21                      totalLenOfWords += token.length();
22
23                      for(int i = 0; i < token.length(); i++ ) {
24                          if ( isalpha( token[ i ] ) ) {
25                              charInWord =  token[ i ];
26                              charInWord = toupper( charInWord );
27                              if (unique.find(charInWord) == std::string::npos)
28                                  unique += charInWord;
29                            } //end if()
30                      } //end for()
31                  } else {
32                      break;
33                  }
34              } // end while()
35              input.close();
36              cout << "Total words   " << " = " << totalNumOfWords << endl;
37              cout <<  "Average length" << " = " << ( totalLenOfWords / totalNumOfWords ) << endl;
38              cout << "Unique letters" << " = " << unique.size() << endl;
39
40          }
41  }
```

Function: Write a C++ function as described, not a complete program.

Submit

You passed 5 of 5 tests.

test #1: wordStats("wordStats-test1-data.txt");
file input: wordStats-test1-data.txt:
```
To be  or not  TO BE,    THAT IS   the question.
```
console output:
```
Total words    = 10
Average length = 3.2
Unique letters = 12
```
result: pass

test #2: wordStats("wordStats-test2-data.txt");
file input: wordStats-test2-data.txt:
```
Teenage Mutant Ninja Turtles,
Teenage Mutant Ninja Turtles,
Teenage Mutant Ninja Turtles,
Heroes in a half shell: turtle power!
END
```
console output:
```
Total words    = 20
Average length = 5.6
Unique letters = 18
```
result: pass

test #3: wordStats("wordStats-test3-data.txt");
file input: wordStats-test3-data.txt:
```
banana
```

console output:

```
Total words    = 1
Average length = 6
Unique letters = 3
```

result: pass

test #4:

```
wordStats("wordStats-test4-data.txt");
```

console output:

```
Error, bad input file.
```

result: pass

test #5:

```
wordStats("bogus-data.txt");
```

console output:

```
Error, bad input file.
```

result: pass

Need help?

Stuck on an exercise? Contact your TA or instructor.

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