**Problem Statement:** Write a C++ program that continues to ask the user for \( n \) test scores. These test scores should **range from 0 to 100**, and your program needs to check that the scores supplied are valid numbers before moving forward. This may include making sure the user doesn’t enter a letter or string of letters.

- Ask the user for the number of test scores he/she wants to enter.
- Repeatedly, ask the user for that number of test scores.
  - For each test score received, check that the test score is a number and it is between 0-100.
  - Print an error message if the number is not in this range, and re-prompt the user for another number.
- After receiving good test scores, then calculate the average and output it to the screen.

**Understanding the Problem:**
This problem is asking me to read an unsigned whole number value, \( n \), from the user, and then read \( n \) unsigned real numbers, which represent test scores, from the user. These scores need to be between 0 and 100, as well as a valid real number. If the user doesn’t enter a valid number or a number in the range, then an error message is printed, and the user is prompted to enter a new number without taking away from the \( n \) valid numbers the user is entering. After the user enters \( n \) valid real numbers in the range of 0-100, then the average is calculated and printed to the screen.

I am assuming the number of tests is an unsigned whole number.
I am assuming the test scores can be unsigned real numbers, instead of just integers.
I am assuming that errors in the user input does not count against the \( n \) numbers to enter.

**Devising a Plan/Design:**

```
Ask for n
if n is Int
  yes
else
  print error

if n > 0 and n is Int
  yes
else
  print error

read test score
if test score is not in range 0-100
  yes
else
  no
```

```
add scores to total
if read == n
  yes
else
  no
```

```
print average
divide total by n
```
Declare n
Prompt user for n
Read n from user
While \((n < 0)\) or \(n\) not an int
  Print error msg.
  Prompt user for n
Read n

For n test scores
  Prompt user for score
  Read score
  While (score \(\geq 100\)) or (score \(< 0\))
    Print error msg.
    Prompt user for score
  Read score
Add score to totalscores
Increment test scores read
Calculate average by totalscores/n
Print test average

don't want to divide by n

Testing:
<table>
<thead>
<tr>
<th>Value</th>
<th>Expected</th>
<th>Actual meet expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n = 0)</td>
<td>Nothing, just exit</td>
<td>Yes</td>
</tr>
<tr>
<td>(n = -1)</td>
<td>Error message and re-prompt the user for a good n value</td>
<td>Yes</td>
</tr>
<tr>
<td>$n = 1.5$</td>
<td>Error message and re-prompt the user for a good $n$ value</td>
<td>Yes</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>$n = 1$</td>
<td>Prompt user for 1 test score</td>
<td>yes</td>
</tr>
<tr>
<td>$n = 5$</td>
<td>Prompt user for 5 tests</td>
<td>yes</td>
</tr>
<tr>
<td>test score = -1</td>
<td>Error message and re-prompt the user for a good test value. This should not count as one of the $n$ tests.</td>
<td>yes</td>
</tr>
<tr>
<td>test score = 100.5</td>
<td>Error message and re-prompt the user for a good test value. This should not count as one of the $n$ tests.</td>
<td>Yes</td>
</tr>
<tr>
<td>test score = 0</td>
<td>Continue to prompt for another test score.</td>
<td>Yes</td>
</tr>
<tr>
<td>$n = 1$, test score = 100</td>
<td>Average should be 100</td>
<td>yes</td>
</tr>
<tr>
<td>$n = 1$, test score = 100.5, test score = 0</td>
<td>Error message for test score, re-prompt for a new test score, and only use valid $n$ tests in average. Average should be 0</td>
<td>yes</td>
</tr>
<tr>
<td>$n = 3$, test score = 100, test score = 0, test score = 50</td>
<td>Average should be 50</td>
<td>yes</td>
</tr>
</tbody>
</table>