Source File: `~/2336/26/lab26.(C|CPP|cpp|c++|cc|cxx|cp)`
Input: under control of `main` function
Output: under control of `main` function
Value: 2

The purpose of this assignment is to perform some vector processing. Three different versions of the same function are to be written, one using indexing, one using iterators, and one using pointers. The prototypes can be found in the `main` function shown below. The functions receive as input a `vector` of `int`egers. Each function returns the ***arithmetic mean*** of the elements. The arithmetic mean is defined as the average of a set of numerical values, as calculated by adding them together and dividing by the number of terms in the set. The mean should be rounded, if necessary.

A sample `main` function for testing your functions is shown in Figure 1. Commands to compile, link, and run this assignment are shown in Figure 2. To use the `Makefile` as distributed in class, add a target of `lab26` to `targets2srcfiles`.

```
1  #include <iostream>
2  #include <cstdlib>
3  #include <vector>
4
5  using namespace std;
6
7  int meanUsingIndexing(const vector<int>& v);
8  int meanUsingIterators(const vector<int>& v);
9  int meanUsingPointers(const vector<int>& v);
10
11 int main()
12 {
13   int num;
14   vector<int> v;
15
16   while (cin >> num)
17     v.push_back(num);
18
19   if (v.size() == 0)
20     cout << "No data\n";
21   else
22   {
23     cout << " Using Indexing Mean = " << meanUsingIndexing(v) << endl;
24     cout << "Using Iterators Mean = " << meanUsingIterators(v) << endl;
25     cout << " Using Pointers Mean = " << meanUsingPointers(v) << endl;
26   }
27
28   return EXIT_SUCCESS;
29 }
```

Figure 1. `/usr/local/2336/src/lab26main.C`

```
newuser@csunix ~> cd 2336
newuser@csunix ~/2336> ./getlab.ksh 26
  * Checking to see if a folder exists for Lab 26. . .No
  * Creating a folder for Lab 26
  * Checking to see if Lab 26 has sample input and output files. . .Yes
  * Copying input and output files for Lab 26
    from folder /usr/local/2336/data/26 to folder ./26
  * Checking to see if /usr/local/2336/src/lab26main.C exists. . .Yes
  * Copying file /usr/local/2336/src/lab26main.C to folder ./26
  * Checking to see if /usr/local/2336/include/lab26.h exists. . .No
  * Copying file /usr/local/2336/src/Makefile to folder ./26
  * Adding a target of lab26 to targets2srcfiles
  * Touching file ./26/lab26.cpp
  * Edit file ./26/lab26.cpp in Notepad++
newuser@csunix ~/2336> cd 26
newuser@csunix ~/2336/26> ls
01.dat       02.out       07.dat       09.out       lab26main.C
01.out       03.dat       07.out       Makefile
02.dat       03.out       09.dat       lab26.cpp
newuser@csunix ~/2336/26> make lab26
g++ -g -Wall -std=c++11 -c lab26main.C -I/usr/local/2336/include -I.
g++ -g -Wall -std=c++11 -c lab26.cpp -I/usr/local/2336/include -I.
g++ -o lab26 lab26main.o lab26.o -L/usr/local/2336/lib -lm -lbits
newuser@csunix ~/2336/26> cat 01.dat
6 2 6
newuser@csunix ~/2336/26> cat 01.dat | ./lab26
 Using Indexing Mean = 5
Using Iterators Mean = 5
 Using Pointers Mean = 5
newuser@csunix ~/2336/26> cat 01.dat | ./lab26 > my.out
newuser@csunix ~/2336/26> diff 01.out my.out
newuser@csunix ~/2336/26> cat 02.dat | ./lab26 > my.out
newuser@csunix ~/2336/26> diff 02.out my.out
newuser@csunix ~/2336/26> cat 03.dat | ./lab26 > my.out
newuser@csunix ~/2336/26> diff 03.out my.out
newuser@csunix ~/2336/26> cat 07.dat | ./lab26 > my.out
newuser@csunix ~/2336/26> diff 07.out my.out
newuser@csunix ~/2336/26> cat 09.dat | ./lab26 > my.out
newuser@csunix ~/2336/26> diff 09.out my.out
newuser@csunix ~/2336/26>
```

Figure 2. Commands to Compile, Link, & Run Lab 26