Source File: ~/1337/60/lab60.(C|CPP|cpp|c++|cc|cxx|cp)
Input: Under control of main function
Output: Under control of main function
Value: 2

For this assignment, write two functions. The first function will sort an array of Rationals. The array should be sorted in ascending order. The second function should write the contents of an array of Rationals, one element per line. The prototype for each of these functions can be found in the sample main function 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 lab60 to targets2srcfileswithlibrary.

```
1   #include <iostream>
2   #include <cstdlib>
3   #include <string>
4   #include <lab59.h>
5
6   using namespace std;
7
8   // Function sort - sorts the n-element array of Rationals in
9   // ascending order
10  void sort(Rational array[], int n);
11
12  // Function writeArray - Writes the n-element array of Rationals to
13  // output stream out, each element on a separate line
14  ostream& writeArray(ostream& out, const Rational array[], int n);
15
16  int main()
17  {
18    Rational rationals[100];
19    unsigned int count = 0;
20
21    while (count < 100 && rationalInput(cin, rationals[count]))
22      ++count;
23
24    cout << "Before Sort:" << endl;
25    writeArray(cout, rationals, count);
26    sort(rationals, count);
27    cout << "After Sort:" << endl;
28    writeArray(cout, rationals, count);
29
30    return EXIT_SUCCESS;
31  }
```

Figure 1. /usr/local/1337/src/lab60main.C

```
1   newuser@csunix ~> cd 1337
2   newuser@csunix ~/1337> mkdir 60
3   newuser@csunix ~/1337> cd 60
4   newuser@csunix ~/1337/60> cp /usr/local/1337/data/60/* .
5   newuser@csunix ~/1337/60> cp /usr/local/1337/src/lab60main.C .
6   newuser@csunix ~/1337/60> cp /usr/local/1337/src/Makefile .
7   newuser@csunix ~/1337/60> touch lab60.cpp
8   newuser@csunix ~/1337/60> # Edit Makefile and lab60.cpp
9   newuser@csunix ~/1337/60> make lab60
10  g++ -g -Wall -std=c++11 -c lab60main.C -I/usr/local/1337/include -I.
11  g++ -g -Wall -std=c++11 -c lab60.cpp -I/usr/local/1337/include -I.
12  g++ -o lab60 lab60main.o lab60.o -L/usr/local/1337/lib -lm -lbits \
13  -Wl,-whole-archive -llab60 -Wl,-no-whole-archive
```

```
14  newuser@csunix ~/1337/60> cat 01.dat       42    [14] = 1/4
15  -3  4 -3  4                                 43    [15] = 3/-2
16  -3  4  3  4                                 44    [16] = -1/-4
17   0  5  0  7                                 45    [17] = -3/-2
18   1  1  5  4                                 46  }
19  25 45  8 99                                 47  After Sort:
20   3  4 -3  4                                 48  array
21   1  4  3  2                                 49  {
22   1  4  3 -2                                 50    [ 0] = 3/-2
23  -1 -4 -3 -2                                 51    [ 1] = -3/4
24  newuser@csunix ~/1337/60> cat 01.dat | ./lab60  52    [ 2] = -3/4
25  Before Sort:                                53    [ 3] = -3/4
26  array                                       54    [ 4] = -3/4
27  {                                           55    [ 5] = 0/5
28    [ 0] = -3/4                               56    [ 6] = 0/7
29    [ 1] = -3/4                               57    [ 7] = 8/99
30    [ 2] = -3/4                               58    [ 8] = 1/4
31    [ 3] = 3/4                                59    [ 9] = 1/4
32    [ 4] = 0/5                                60    [10] = -1/-4
33    [ 5] = 0/7                                61    [11] = 25/45
34    [ 6] = 1/1                                62    [12] = 3/4
35    [ 7] = 5/4                                63    [13] = 3/4
36    [ 8] = 25/45                              64    [14] = 1/1
37    [ 9] = 8/99                               65    [15] = 5/4
38    [10] = 3/4                                66    [16] = 3/2
39    [11] = -3/4                               67    [17] = -3/-2
40    [12] = 1/4                                68  }
41    [13] = 3/2
```

```
69  newuser@csunix ~/1337/60> cat 01.dat | ./lab60 > my.out
70  newuser@csunix ~/1337/60> diff 01.out my.out
71  newuser@csunix ~/1337/60> cat 04.dat | ./lab60 > my.out
72  newuser@csunix ~/1337/60> diff 04.out my.out
73  newuser@csunix ~/1337/60>
```

Figure 2. Commands to Compile, Link, & Run Lab 60