Source File: `~/2336/16/lab16.(C|CPP|cpp|c++|cc|cxx|cp)`
Input: under control of `main` function
Output: under control of `main` function
Value: 1

Write a recursive function that prints the octal representation of a signed, nonzero integer. A sample `main` function for testing your function is shown in Figure 1 and commands for compiling, linking, and running this assignment are shown in Figure 2. To use the `Makefile` as distributed in class, add a target of `lab16` to `targets2srcfiles`.

```
1  #include <iostream>
2  #include <cstdlib>
3  #include <iomanip>
4
5  using namespace std;
6
7  // printOctal is a recursive function that writes the octal
8  // representation of num to output stream os
9  void printOctal(int num, ostream& os);
10
11 int main()
12 {
13   int num;
14
15   while (cin >> num)
16   {
17     cout << right << setw(11) << num << " base 10 = ";
18     if (num != 0)
19       printOctal(num, cout);
20     else
21       cout << 0;
22     cout << " base 8" << endl;
23   }
24
25   return EXIT_SUCCESS;
26 }
```

Figure 1. `/usr/local/2336/src/lab16main.C`

```
newuser@csunix ~> cd 2336
newuser@csunix ~/2336> ./getlab.ksh 16
  * Checking to see if a folder exists for Lab 16. . .No
  * Creating a folder for Lab 16
  * Checking to see if Lab 16 has sample input and output files. . .Yes
  * Copying input and output files for Lab 16
    from folder /usr/local/2336/data/16 to folder ./16
  * Checking to see if /usr/local/2336/src/lab16main.C exists. . .Yes
  * Copying file /usr/local/2336/src/lab16main.C to folder ./16
  * Checking to see if /usr/local/2336/include/lab16.h exists. . .No
  * Copying file /usr/local/2336/src/Makefile to folder ./16
  * Adding a target of lab16 to targets2srcfiles
  * Touching file ./16/lab16.cpp
  * Edit file ./16/lab16.cpp in Notepad++
newuser@csunix ~/2336> cd 16
newuser@csunix ~/2336/16> ls
01.dat       01.out       Makefile     lab16.cpp    lab16main.C
newuser@csunix ~/2336/16> make lab16
g++ -g -Wall -std=c++11 -c lab16main.C -I/usr/local/2336/include -I.
g++ -g -Wall -std=c++11 -c lab16.cpp -I/usr/local/2336/include -I.
g++ -o lab16 lab16main.o lab16.o -L/usr/local/2336/lib -lm -lbits
newuser@csunix ~/2336/16> cat 01.dat
0 1 2 3341 2147483647
-1 -2 -3341 -2147483647
-2147483648
newuser@csunix ~/2336/16> cat 01.dat | ./lab16
          0 base 10 = 0 base 8
          1 base 10 = 1 base 8
          2 base 10 = 2 base 8
       3341 base 10 = 6415 base 8
 2147483647 base 10 = 17777777777 base 8
         -1 base 10 = 37777777777 base 8
         -2 base 10 = 37777777776 base 8
      -3341 base 10 = 37777771363 base 8
-2147483647 base 10 = 20000000001 base 8
-2147483648 base 10 = 20000000000 base 8
newuser@csunix ~/2336/16> cat 01.dat | ./lab16 > my.out
newuser@csunix ~/2336/16> diff 01.out my.out
newuser@csunix ~/2336/16>
```

Figure 2. Commands to Compile, Link, & Run Lab 16