Source File: `~/2336/18/lab18.(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 base 32 representation of a signed, nonzero integer. Use a digit set of $\{0-9, \mathrm{A}-\mathrm{V}\}$. 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 `lab18` to `targets2srcfiles`.

```
1  #include <iostream>
2  #include <cstdlib>
3  #include <iomanip>
4
5  using namespace std;
6
7  // printBase32 is a recursive function that writes the base32
8  // representation of num to output stream os
9  void printBase32(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       printBase32(num, cout);
20     else
21       cout << 0;
22     cout << " base 32" << endl;
23   }
24
25   return EXIT_SUCCESS;
26 }
```

Figure 1. `/usr/local/2336/src/lab18main.C`

```
newuser@csunix ~> cd 2336
newuser@csunix ~/2336> ./getlab.ksh 18
  * Checking to see if a folder exists for Lab 18. . .No
  * Creating a folder for Lab 18
  * Checking to see if Lab 18 has sample input and output files. . .Yes
  * Copying input and output files for Lab 18
    from folder /usr/local/2336/data/18 to folder ./18
  * Checking to see if /usr/local/2336/src/lab18main.C exists. . .Yes
  * Copying file /usr/local/2336/src/lab18main.C to folder ./18
  * Checking to see if /usr/local/2336/include/lab18.h exists. . .No
  * Copying file /usr/local/2336/src/Makefile to folder ./18
  * Adding a target of lab18 to targets2srcfiles
  * Touching file ./18/lab18.cpp
  * Edit file ./18/lab18.cpp in Notepad++
newuser@csunix ~/2336> cd 18
newuser@csunix ~/2336/18> ls
01.dat       01.out       Makefile     lab18.cpp    lab18main.C
newuser@csunix ~/2336/18> make lab18
g++ -g -Wall -std=c++11 -c lab18main.C -I/usr/local/2336/include -I.
g++ -g -Wall -std=c++11 -c lab18.cpp -I/usr/local/2336/include -I.
g++ -o lab18 lab18main.o lab18.o -L/usr/local/2336/lib -lm -lbits
newuser@csunix ~/2336/18> cat 01.dat
0 1 2 3341 2147483647
-1 -2 -3341 -2147483647
-2147483648
newuser@csunix ~/2336/18> cat 01.dat | ./lab18
          0 base 10 = 0 base 32
          1 base 10 = 1 base 32
          2 base 10 = 2 base 32
       3341 base 10 = 38D base 32
 2147483647 base 10 = 1VVVVVV base 32
         -1 base 10 = 3VVVVVV base 32
         -2 base 10 = 3VVVVVU base 32
      -3341 base 10 = 3VVVSNJ base 32
-2147483647 base 10 = 2000001 base 32
-2147483648 base 10 = 2000000 base 32
newuser@csunix ~/2336/18> cat 01.dat | ./lab18 > my.out
newuser@csunix ~/2336/18> diff 01.out my.out
newuser@csunix ~/2336/18>
```

Figure 2. Commands to Compile, Link, & Run Lab 18