With gdb debugging we can easily see that the fib function has been called 15 times. Generally speaking, each recursive call to a function opens up a new stack space, but the fib function does not. Because fib is a tail recursive function, with the compiler's optimisation, only a stack needs to be stacked. So the function stacks printed out by gdb are the same. Here are my gdb debugging notes.

```
[lil7@chuck MA5621]$ ls
fib.c
[lil7@chuck MA5621]$ gcc -g -o fib fib.c
[lil7@chuck MA5621]$ ls
fib   fib.c
[lil7@chuck MA5621]$ gdb fib
GNU gdb (GDB) Red Hat Enterprise Linux 7.6.1-119.el7
Copyright (C) 2013 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.   Type "show copying"
and "show warranty" for details.
This GDB was configured as "x86_64-redhat-linux-gnu".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from /home/users/mschpc/2020/lil7/MA5621/fib...done.
(gdb) break fib
Breakpoint 1 at 0x4005be: file fib.c, line 5.
(gdb) run
Starting program: /home/users/mschpc/2020/lil7/MA5621/fib

Breakpoint 1, fib (i=5) at fib.c:5
5               if (i==0 || i==1) return 1;
Missing separate debuginfos, use: debuginfo-install glibc-2.17-317.el7.x86_64
(gdb) bt
#0   fib (i=5) at fib.c:5
#1   0x0000000000400604 in main () at fib.c:11
(gdb) c
Continuing.

Breakpoint 1, fib (i=4) at fib.c:5
5               if (i==0 || i==1) return 1;
(gdb) bt
#0   fib (i=4) at fib.c:5
#1   0x00000000004005de in fib (i=5) at fib.c:6
#2   0x0000000000400604 in main () at fib.c:11
(gdb) c
```

Continuing.

Breakpoint 1, fib (i=3) at fib.c:5
5   if (i==0 || i==1) return 1;
(gdb) bt
#0 fib (i=3) at fib.c:5
#1 0x00000000004005de in fib (i=4) at fib.c:6
#2 0x00000000004005de in fib (i=5) at fib.c:6
#3 0x0000000000400604 in main () at fib.c:11
(gdb) c
Continuing.

Breakpoint 1, fib (i=2) at fib.c:5
5   if (i==0 || i==1) return 1;
(gdb) bt
#0 fib (i=2) at fib.c:5
#1 0x00000000004005de in fib (i=3) at fib.c:6
#2 0x00000000004005de in fib (i=4) at fib.c:6
#3 0x00000000004005de in fib (i=5) at fib.c:6
#4 0x0000000000400604 in main () at fib.c:11
(gdb) c
Continuing.

Breakpoint 1, fib (i=1) at fib.c:5
5   if (i==0 || i==1) return 1;
(gdb) bt
#0 fib (i=1) at fib.c:5
#1 0x00000000004005de in fib (i=2) at fib.c:6
#2 0x00000000004005de in fib (i=3) at fib.c:6
#3 0x00000000004005de in fib (i=4) at fib.c:6
#4 0x00000000004005de in fib (i=5) at fib.c:6
#5 0x0000000000400604 in main () at fib.c:11
(gdb) c
Continuing.

Breakpoint 1, fib (i=0) at fib.c:5
5   if (i==0 || i==1) return 1;
(gdb) bt
#0 fib (i=0) at fib.c:5
#1 0x00000000004005ed in fib (i=2) at fib.c:6
#2 0x00000000004005de in fib (i=3) at fib.c:6
#3 0x00000000004005de in fib (i=4) at fib.c:6
#4 0x00000000004005de in fib (i=5) at fib.c:6
#5 0x0000000000400604 in main () at fib.c:11

```
(gdb) c
Continuing.

Breakpoint 1, fib (i=1) at fib.c:5
5               if (i==0 || i==1) return 1;
(gdb) bt
#0   fib (i=1) at fib.c:5
#1   0x00000000004005ed in fib (i=3) at fib.c:6
#2   0x00000000004005de in fib (i=4) at fib.c:6
#3   0x00000000004005de in fib (i=5) at fib.c:6
#4   0x0000000000400604 in main () at fib.c:11
(gdb) c
Continuing.

Breakpoint 1, fib (i=2) at fib.c:5
5               if (i==0 || i==1) return 1;
(gdb) bt
#0   fib (i=2) at fib.c:5
#1   0x00000000004005ed in fib (i=4) at fib.c:6
#2   0x00000000004005de in fib (i=5) at fib.c:6
#3   0x0000000000400604 in main () at fib.c:11
(gdb) c
Continuing.

Breakpoint 1, fib (i=1) at fib.c:5
5               if (i==0 || i==1) return 1;
(gdb) bt
#0   fib (i=1) at fib.c:5
#1   0x00000000004005de in fib (i=2) at fib.c:6
#2   0x00000000004005ed in fib (i=4) at fib.c:6
#3   0x00000000004005de in fib (i=5) at fib.c:6
#4   0x0000000000400604 in main () at fib.c:11
(gdb) c
Continuing.

Breakpoint 1, fib (i=0) at fib.c:5
5               if (i==0 || i==1) return 1;
(gdb) bt
#0   fib (i=0) at fib.c:5
#1   0x00000000004005ed in fib (i=2) at fib.c:6
#2   0x00000000004005ed in fib (i=4) at fib.c:6
#3   0x00000000004005de in fib (i=5) at fib.c:6
#4   0x0000000000400604 in main () at fib.c:11
(gdb) c
```

Continuing.

Breakpoint 1, fib (i=3) at fib.c:5
5   if (i==0 || i==1) return 1;
(gdb) bt
#0   fib (i=3) at fib.c:5
#1   0x00000000004005ed in fib (i=5) at fib.c:6
#2   0x0000000000400604 in main () at fib.c:11
(gdb) c
Continuing.

Breakpoint 1, fib (i=2) at fib.c:5
5   if (i==0 || i==1) return 1;
(gdb) bt
#0   fib (i=2) at fib.c:5
#1   0x00000000004005de in fib (i=3) at fib.c:6
#2   0x00000000004005ed in fib (i=5) at fib.c:6
#3   0x0000000000400604 in main () at fib.c:11
(gdb) c
Continuing.

Breakpoint 1, fib (i=1) at fib.c:5
5   if (i==0 || i==1) return 1;
(gdb) bt
#0   fib (i=1) at fib.c:5
#1   0x00000000004005de in fib (i=2) at fib.c:6
#2   0x00000000004005de in fib (i=3) at fib.c:6
#3   0x00000000004005ed in fib (i=5) at fib.c:6
#4   0x0000000000400604 in main () at fib.c:11
(gdb) c
Continuing.

Breakpoint 1, fib (i=0) at fib.c:5
5   if (i==0 || i==1) return 1;
(gdb) bt
#0   fib (i=0) at fib.c:5
#1   0x00000000004005ed in fib (i=2) at fib.c:6
#2   0x00000000004005de in fib (i=3) at fib.c:6
#3   0x00000000004005ed in fib (i=5) at fib.c:6
#4   0x0000000000400604 in main () at fib.c:11
(gdb) c
Continuing.

Breakpoint 1, fib (i=1) at fib.c:5

```
5               if (i==0 || i==1) return 1;
(gdb) bt
#0   fib (i=1) at fib.c:5
#1   0x00000000004005ed in fib (i=3) at fib.c:6
#2   0x00000000004005ed in fib (i=5) at fib.c:6
#3   0x0000000000400604 in main () at fib.c:11
(gdb) c
Continuing.
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[Inferior 1 (process 12741) exited normally]
(gdb) q
[lil7@chuck MA5621]$
```