Software Engineering

Assignments-2 on gdb

Name -Aritra Mondal

Department - Information Technology

Roll No - 002311001091

Section - A3

The program code is as follows:

```c
#include <stdio.h>


int main()
{
   int i,j,k;
   for ( i= 0 ; i< 10; i++)
    for ( j = 0; j< 200; j++)
        for (k = 0; k< 3000; k++)
        {
            int t1,t2;
            t1=i;
            t2=j;
            if ((k !=0) && (k%1000 == 0))
                printf ("you have reached [%d][%d][%d]-th iteraion \n",t1,t2,k);
        }
}
```

<a> Consider the program in folder assign2.

a. Put a breakpoint in 1st executable line of the innermost loop.

Ans - From the program, we see the first executable line is line no 12 in d.c (t1 = i;)

```
(gdb) break d.c:12
Breakpoint 1 at 0x401492: file d.c, line 12.
```

b. If you run and continue, how many times it is supposed to stop at breakpoint 1?

Ans - Breakpoint is hit 10 times, 200 times and 3000 times for the 1st, 2nd and 3rd loop respectively. So the

total no of times breakpoint 1 will be hit = 10*200*3000 = 6000000.

```
(gdb) info breakpoints
Num     Type           Disp Enb Address    What
1       breakpoint     keep y   0x00401492 in main at d.c:12
```

c. How will you continue so that it stops at 1000th iteration of innermost loop ?

Ans - ignore <breakpoint Number> <no. of times>.

ignore 1 1000

```
(gdb) ignore 1 1000
Will ignore next 1000 crossings of breakpoint 1.
(gdb) run
Starting program: C:\Users\Admin\Desktop\Assignments\assign2/out.exe
[New Thread 10680.0x25a8]
[New Thread 10680.0x2e60]

Breakpoint 1, main () at d.c:12
12                  t1=i;
(gdb) continue
Continuing.
you have reached [0][0][1000]-th iteraion

Breakpoint 1, main () at d.c:12
12                  t1=i;
```

d. How you can condition your breakpoint , so that the loop stops at every 1000th iteration of innermost loop ?

Ans - condition 1 k>0 && (k-999)%1000 == 0, run, continue or c, continue or c, info breakpoints

```
(gdb) condition 1 k>0 && (k-999)%1000 == 0
(gdb) run
The program being debugged has been started already.
Start it from the beginning? (y or n) y
Starting program: C:\Users\Admin\Desktop\Assignments\assign2/out.exe
[New Thread 2292.0xc10]
[New Thread 2292.0x668]

Breakpoint 1, main () at d.c:12
12                  t1=i;
(gdb) c
Continuing.
you have reached [0][0][1000]-th iteraion

Breakpoint 1, main () at d.c:12
12                  t1=i;
(gdb) c
Continuing.
you have reached [0][0][2000]-th iteraion

Breakpoint 1, main () at d.c:12
12                  t1=i;
(gdb) info breakpoints
Num     Type           Disp Enb Address    What
1       breakpoint     keep y   0x00401492 in main at d.c:12
        stop only if k>0 && (k-999)%1000 == 0
        breakpoint already hit 3 times
```

e. Put a breakpoint in the 1st line of outermost loop.

Ans - break d.c:8 or break 8

```
(gdb) break 8
Breakpoint 2 at 0x40147b: file d.c, line 8.
```

f. Disable breakpoint “1”

Ans - disable breakpoint <breakpoint Number>

Example: disable breakpoint 1, info breakpoints

```
(gdb) disable breakpoint 1
(gdb) info breakpoints
Num     Type           Disp Enb Address    What
1       breakpoint     keep n   0x00401492 in main at d.c:12
        stop only if k>0 && (k-999)%1000 == 0
        breakpoint already hit 3 times
2       breakpoint     keep y   0x0040147b in main at d.c:8
```

g. Add a command to breakpoint 2 so that it prints the value of “i” at each hit.

Ans - command 2, print i, end, continue

```
(gdb) command 2
Type commands for breakpoint(s) 2, one per line.
End with a line saying just "end".
>print i
>end
(gdb) continue
Continuing.
[New Thread 2292.0x2f0c]
you have reached [0][1][1000]-th iteraion
you have reached [0][1][2000]-th iteraion
you have reached [0][2][1000]-th iteraion
you have reached [0][2][2000]-th iteraion
you have reached [0][3][1000]-th iteraion
you have reached [0][3][2000]-th iteraion
you have reached [0][4][1000]-th iteraion
```

.
.
.
.
.
.
.

```
you have reached [0][194][2000]-th iteraion
you have reached [0][195][1000]-th iteraion
you have reached [0][195][2000]-th iteraion
you have reached [0][196][1000]-th iteraion
you have reached [0][196][2000]-th iteraion
you have reached [0][197][1000]-th iteraion
you have reached [0][197][2000]-th iteraion
you have reached [0][198][1000]-th iteraion
you have reached [0][198][2000]-th iteraion
you have reached [0][199][1000]-th iteraion
you have reached [0][199][2000]-th iteraion

Breakpoint 2, main () at d.c:8
8           for ( j = 0; j< 200; j++)
$1 = 1
```

h. Delete breakpoint 2.

Ans - delete breakpoint <breakpoint Number>

example- delete breakpoint 2, info breakpoints(to see the current breakpoints)