422101
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WEEK-07(Assignment-08):

Debug different c programs using GDB utility in linux

Program - 01:

```
student@m2:~/Desktop/422101$ cc factorial.c
student@m2:~/Desktop/422101$ ./a.out
Enter the number: 2
The factorial of 2 is 32767
student@m2:~/Desktop/422101$ cc -g factorial.c
student@m2:~/Desktop/422101$ gdb a.out
GNU gdb (Ubuntu 9.2-0ubuntu1~20.04.1) 9.2
Copyright (C) 2020 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-linux-gnu".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>.
Find the GDB manual and other documentation resources online at:
    <http://www.gnu.org/software/gdb/documentation/>.

For help, type "help".
Type "apropos word" to search for commands related to "word"...
Reading symbols from a.out...
(gdb) break 10
Breakpoint 1 at 0x11d6: file factorial.c, line 10.
(gdb) run
Starting program: /home/student/Desktop/422101/a.out
Enter the number: 2

Breakpoint 1, main () at factorial.c:10
10                      j=j*i;
(gdb) p i
$1 = 1
(gdb) p j
$2 = 32767
(gdb) p num
$3 = 2
(gdb) r
The program being debugged has been started already.
Start it from the beginning? (y or n) y
Starting program: /home/student/Desktop/422101/a.out
Enter the number: 2

Breakpoint 1, main () at factorial.c:10
10                      j=j*i;
(gdb)
```

```
(gdb) break 10
Breakpoint 1 at 0x11d6: file factorial.c, line 10.
(gdb) run
Starting program: /home/student/Desktop/422101/a.out
Enter the number: 2

Breakpoint 1, main () at factorial.c:10
10                      j=j*i;
(gdb) p i
$1 = 1
(gdb) p j
$2 = 32767
(gdb) p num
$3 = 2
(gdb) r
The program being debugged has been started already.
Start it from the beginning? (y or n) y
Starting program: /home/student/Desktop/422101/a.out
Enter the number: 2

Breakpoint 1, main () at factorial.c:10
10                      j=j*i;
(gdb) break 2
Breakpoint 2 at 0x555555555189: file factorial.c, line 4.
(gdb) r
The program being debugged has been started already.
Start it from the beginning? (y or n) y
Starting program: /home/student/Desktop/422101/a.out

Breakpoint 2, main () at factorial.c:4
4       {
(gdb)
```

```
(gdb) clear

(gdb) clear
Deleted breakpoint 1 No breakpoint at this line.
```

Run - 02:

```
GNU gdb (Ubuntu 9.2-0ubuntu1~20.04.1) 9.2
Copyright (C) 2020 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-linux-gnu".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>.
Find the GDB manual and other documentation resources online at:
    <http://www.gnu.org/software/gdb/documentation/>.

For help, type "help".
Type "apropos word" to search for commands related to "word"...
Reading symbols from a.out...
(gdb) break 10
Breakpoint 1 at 0x11d6: file factorial.c, line 10.
(gdb) run [2]
Starting program: /home/student/Desktop/422255/unix/a.out [2]
Enter the number: 2

Breakpoint 1, main () at factorial.c:10
10                      j=j*i;
(gdb) print i
$1 = 1
(gdb) print num
$2 = 2
(gdb) p i
$3 = 1
(gdb) p j
$4 = 32767
(gdb) c
Continuing.
The factorial of 2 is 32767
[Inferior 1 (process 5147) exited normally]
(gdb) n
The program is not being run.
(gdb) s
The program is not being run.
```

```
(gdb) r
Starting program: /home/student/Desktop/422255/unix/a.out [2]
Enter the number: 3

Breakpoint 1, main () at factorial.c:10
10                      j=j*i;
(gdb) disavle
Undefined command: "disavle".  Try "help".
(gdb) disable
(gdb) r
The program being debugged has been started already.
Start it from the beginning? (y or n) y
Starting program: /home/student/Desktop/422255/unix/a.out [2]
Enter the number: 3
The factorial of 3 is 65534
[Inferior 1 (process 5158) exited normally]
(gdb) l
5               int i, num, j;
6               printf ("Enter the number: ");
7               scanf ("%d", &num );
8
9               for (i=1; i<num; i++)
10                      j=j*i;
11
12              printf("The factorial of %d is %d\n",num,j);
13      }
```

```
(gdb) break factorial.c:line_number
Function "line_number" not defined in "factorial.c".
Make breakpoint pending on future shared library load? (y or [n]) y
Breakpoint 2 (factorial.c:line_number) pending.
(gdb) b 10
Note: breakpoint 1 (disabled) also set at pc 0x5555555551d6.
Breakpoint 3 at 0x5555555551d6: file factorial.c, line 10.
(gdb) break factorial.c:10
Note: breakpoints 1 (disabled) and 3 also set at pc 0x5555555551d6.
B Text Editor 4 at 0x5555555551d6: file factorial.c, line 10.
(gdb) disable
(gdb) disable
(gdb) disable
(gdb) disable
(gdb) disable
(gdb) disable
(gdb) break factorial.c:10
Note: breakpoints 1 (disabled), 3 (disabled) and 4 (disabled) also set at pc 0x5555555551d6.
Breakpoint 5 at 0x5555555551d6: file factorial.c, line 10.
(gdb) run
Starting program: /home/student/Desktop/422255/unix/a.out [2]
Enter the number: 2

Breakpoint 5, main () at factorial.c:10
10                      j=j*i;
(gdb) b 9
Breakpoint 6 at 0x5555555551cd: file factorial.c, line 9.
(gdb) run
The program being debugged has been started already.
Start it from the beginning? (y or n) y
Starting program: /home/student/Desktop/422255/unix/a.out [2]
Enter the number: 2

Breakpoint 6, main () at factorial.c:9
9               for (i=1; i<num; i++)
(gdb) Quit
```