

Q1 SIGNALS

The screenshot shows the OnlineGDB interface. On the left is a sidebar with navigation links: OnlineGDB beta, code compile run debug share, IDE, My Projects, Classroom, Learn Programming, Programming Questions, Sign Up, and Login. Below these are social media icons for Facebook, Twitter, and a red button with a plus sign and 'GITHUB'. A section titled 'GOT AN OPINION?' with a lightbulb icon and text 'Have fun taking surveys and get paid! ADD VIA CARBON' is also present. At the bottom of the sidebar are links for About, FAQ, Blog, Terms of Use, Contact Us, GDB Tutorial, Credits, and Privacy, along with the copyright notice '© 2016 - 2020 GDB Online'. The main area displays a C program in 'main.c' with the code:

```
1 Hello world
```

. Above the code editor are buttons for Run, Debug, Stop, Share, Save, and Beautify. The output window at the bottom shows the following text:

```
main.c:14:5: warning: 'gets' is deprecated [-Wdeprecated-declarations]
/usr/include/stdio.h:638:14: note: declared here
main.c:(.text+0x38): warning: the 'gets' function is dangerous and should not be used.
Hello world

...Program finished with exit code 0
Press ENTER to exit console.
```

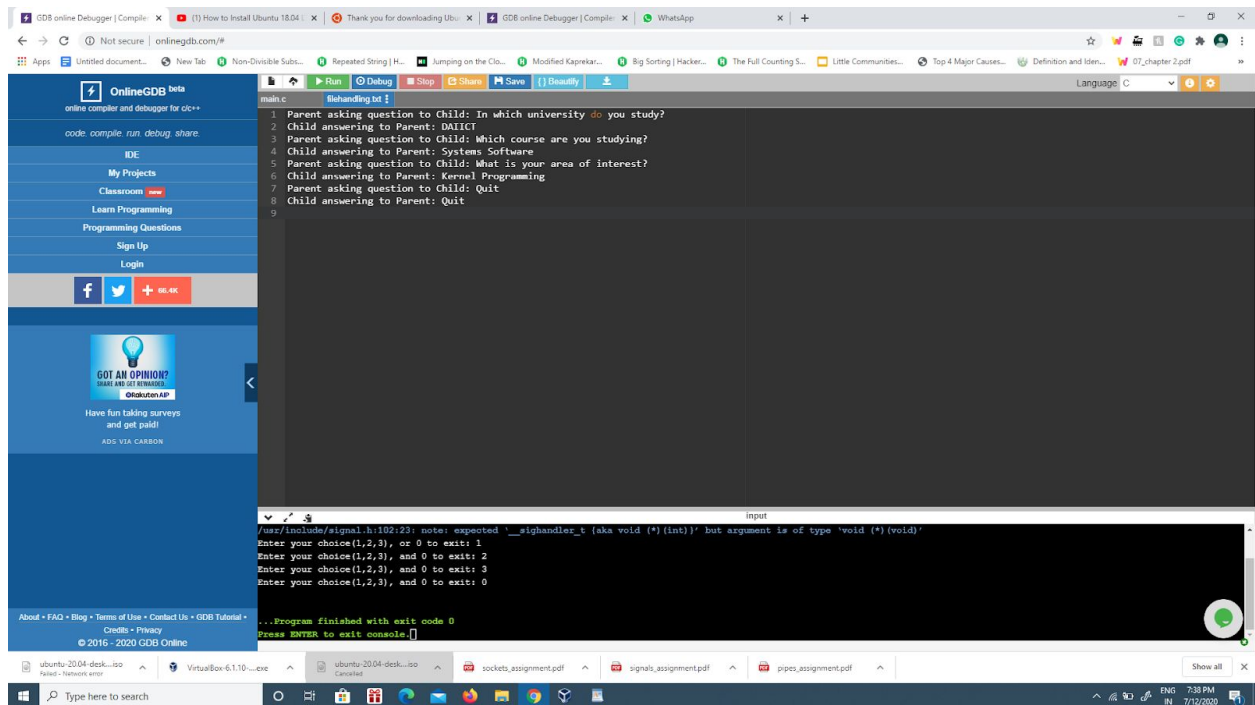
This screenshot shows the OnlineGDB interface with a different C program. The code in 'main.c' is:

```
1 It took too long to enter the string
2
```

. The output window displays the same deprecation warnings as the first screenshot, followed by:

```
...Program finished with exit code 255
Press ENTER to exit console.
```

Q2 SIGNALS



The screenshot displays the OnlineGDB IDE interface. On the left, there is a sidebar with navigation links: "OnlineGDB beta", "code compile run debug share", "IDE", "My Projects", "Classroom", "Learn Programming", "Programming Questions", "Sign Up", and "Login". Below these are social media icons for Facebook, Twitter, and a generic share icon. A banner for "GOT AN OPINION?" is also visible. The main area shows a C program titled "main.c" with the following code:

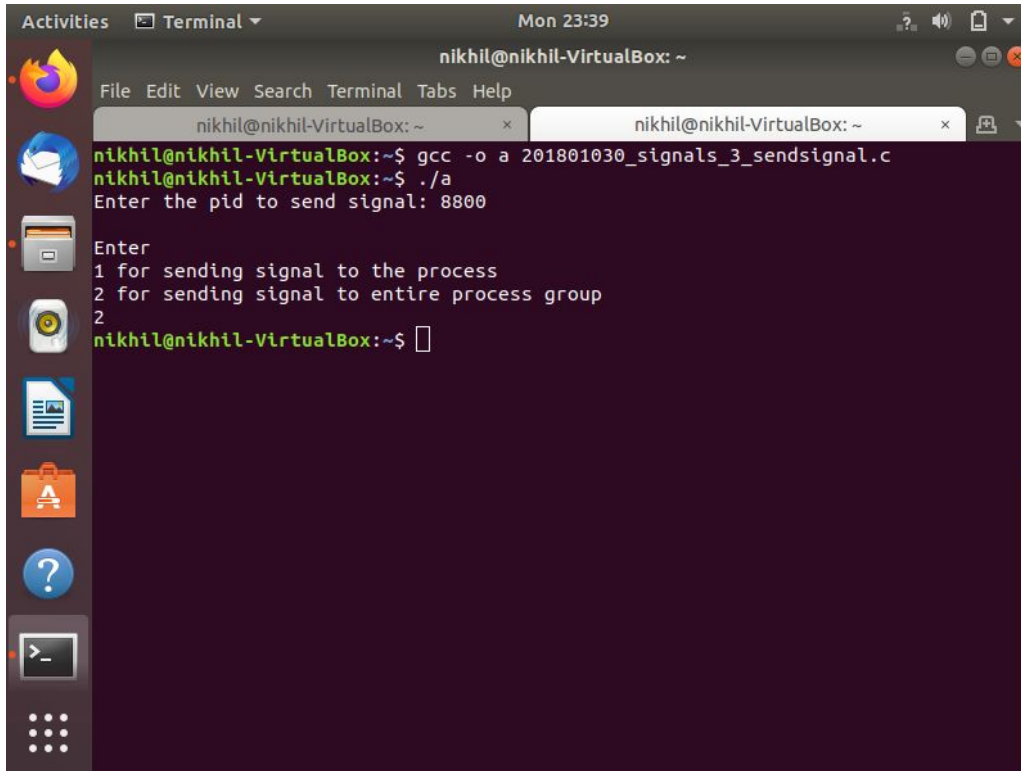
```
1 Parent asking question to Child: In which university do you study?
2 Child answering to Parent: DAIICT
3 Parent asking question to Child: Which course are you studying?
4 Child answering to Parent: Systems Software
5 Parent asking question to Child: What is your area of interest?
6 Child answering to Parent: Kernel Programming
7 Parent asking question to Child: Quit
8 Child answering to Parent: Quit
9
```

The program is compiled and run successfully. The output shows the simulation of the parent-child interaction. A note from the compiler indicates a warning about the type of the signal handler argument.

```
input
/usr/include/signal.h:102:23: note: expected '__sig_handler_t (aka void (*)(int))' but argument is of type 'void (*)(void)'
Enter your choice(1,2,3), or 0 to exit: 1
Enter your choice(1,2,3), and 0 to exit: 2
Enter your choice(1,2,3), and 0 to exit: 3
Enter your choice(1,2,3), and 0 to exit: 0
...Program finished with exit code 0
Press ENTER to exit console.
```

The bottom of the screen shows the Windows taskbar with the date and time as 7:33 PM on 7/12/2020.

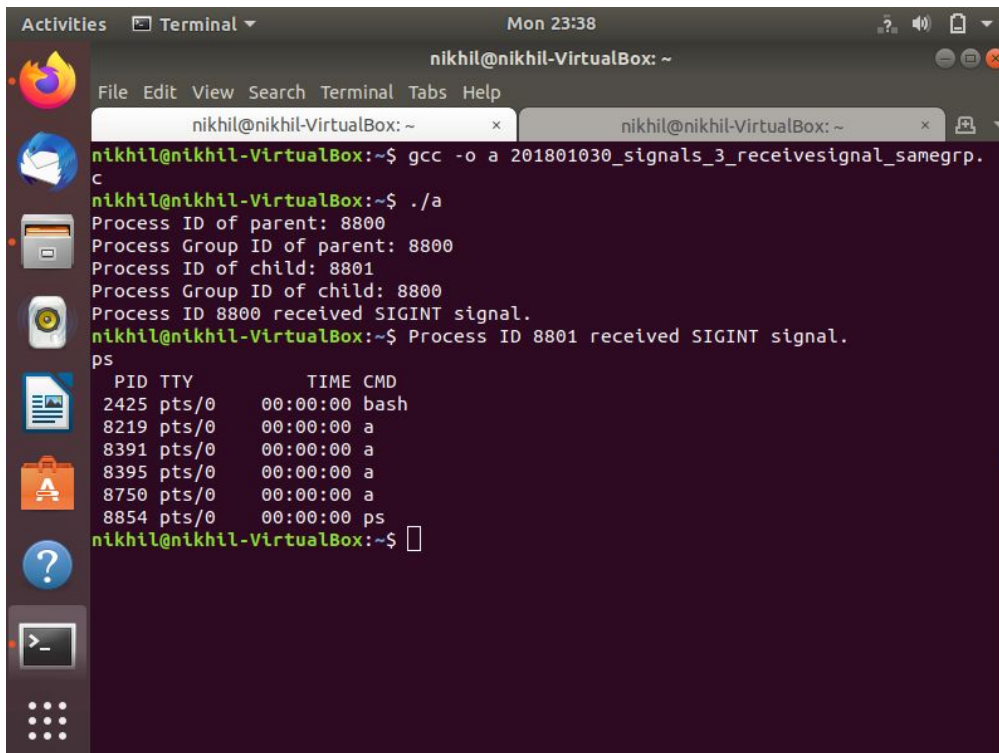
Q3 SIGNALS Execution-1



A terminal window titled "nikhil@nikhil-VirtualBox: ~" with a menu bar (File, Edit, View, Search, Terminal, Tabs, Help). The terminal shows the following commands and output:

```
nikhil@nikhil-VirtualBox:~$ gcc -o a 201801030_signals_3_sendsignal.c
nikhil@nikhil-VirtualBox:~$ ./a
Enter the pid to send signal: 8800

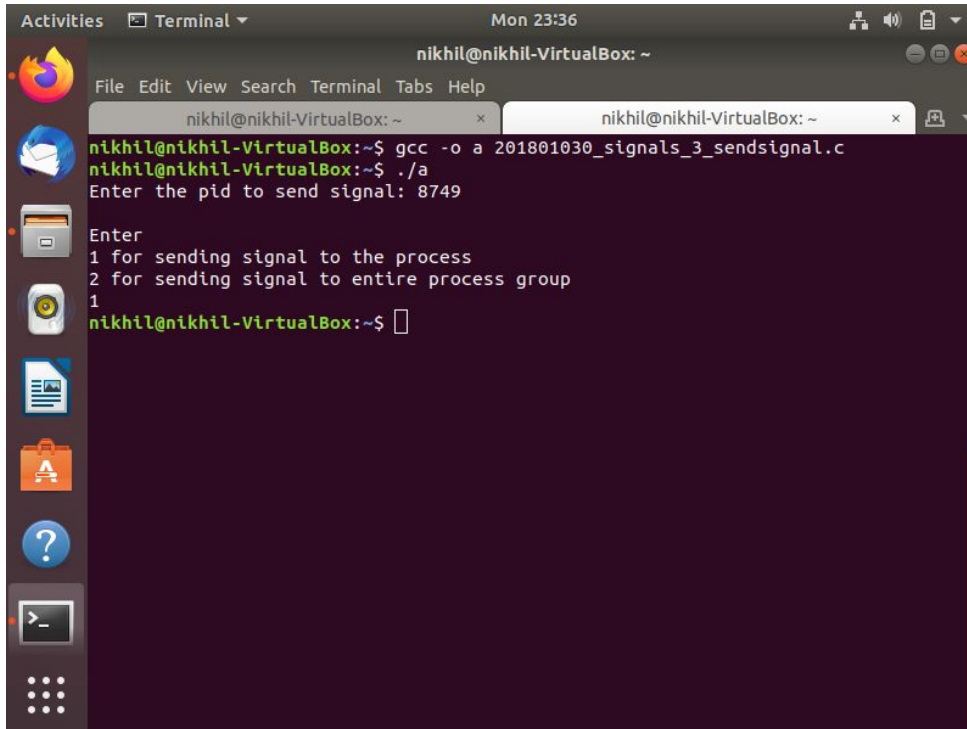
Enter
1 for sending signal to the process
2 for sending signal to entire process group
2
nikhil@nikhil-VirtualBox:~$
```



A terminal window titled "nikhil@nikhil-VirtualBox: ~" with a menu bar (File, Edit, View, Search, Terminal, Tabs, Help). The terminal shows the following commands and output:

```
nikhil@nikhil-VirtualBox:~$ gcc -o a 201801030_signals_3_receivesignal_samegrp.c
nikhil@nikhil-VirtualBox:~$ ./a
Process ID of parent: 8800
Process Group ID of parent: 8800
Process ID of child: 8801
Process Group ID of child: 8800
Process ID 8800 received SIGINT signal.
nikhil@nikhil-VirtualBox:~$ Process ID 8801 received SIGINT signal.
ps
  PID TTY          TIME CMD
 2425 pts/0        00:00:00 bash
 8219 pts/0        00:00:00 a
 8391 pts/0        00:00:00 a
 8395 pts/0        00:00:00 a
 8750 pts/0        00:00:00 a
 8854 pts/0        00:00:00 ps
nikhil@nikhil-VirtualBox:~$
```

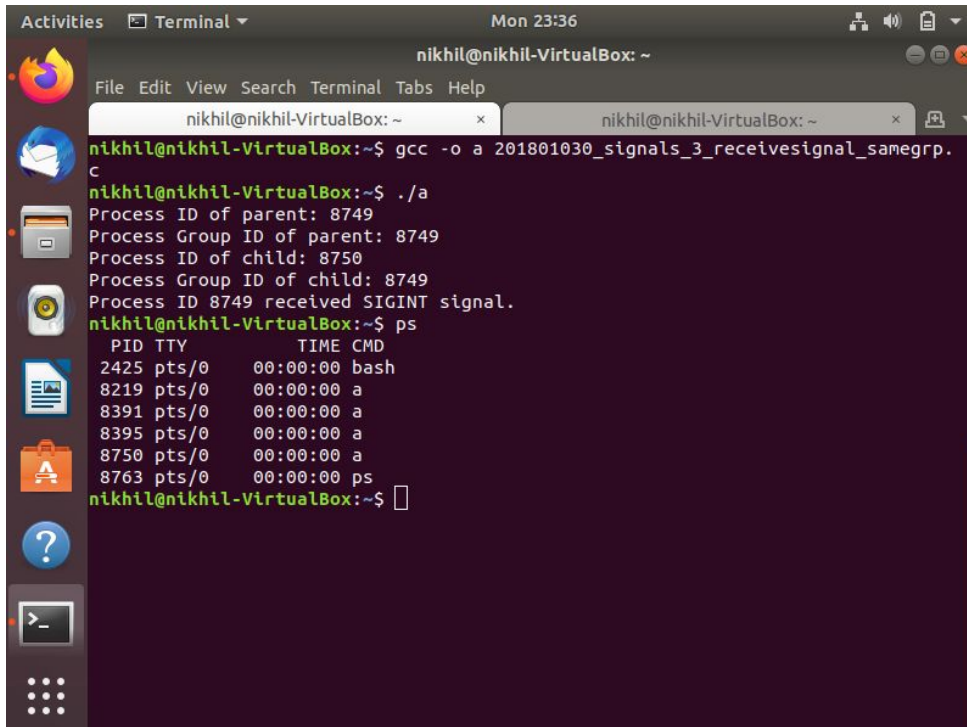
Q3 SIGNALS Execution-2



A terminal window titled "nikhil@nikhil-VirtualBox: ~" showing the execution of a program. The user enters the command to compile a C file named "201801030_signals_3_sendsignal.c" using gcc, resulting in an executable named "a". Then, the user runs the executable with "./a", which prompts for a PID to send a signal to. The user enters "8749". The program then prompts for an action: "1 for sending signal to the process" or "2 for sending signal to entire process group". The user enters "1".

```
nikhil@nikhil-VirtualBox:~$ gcc -o a 201801030_signals_3_sendsignal.c
nikhil@nikhil-VirtualBox:~$ ./a
Enter the pid to send signal: 8749

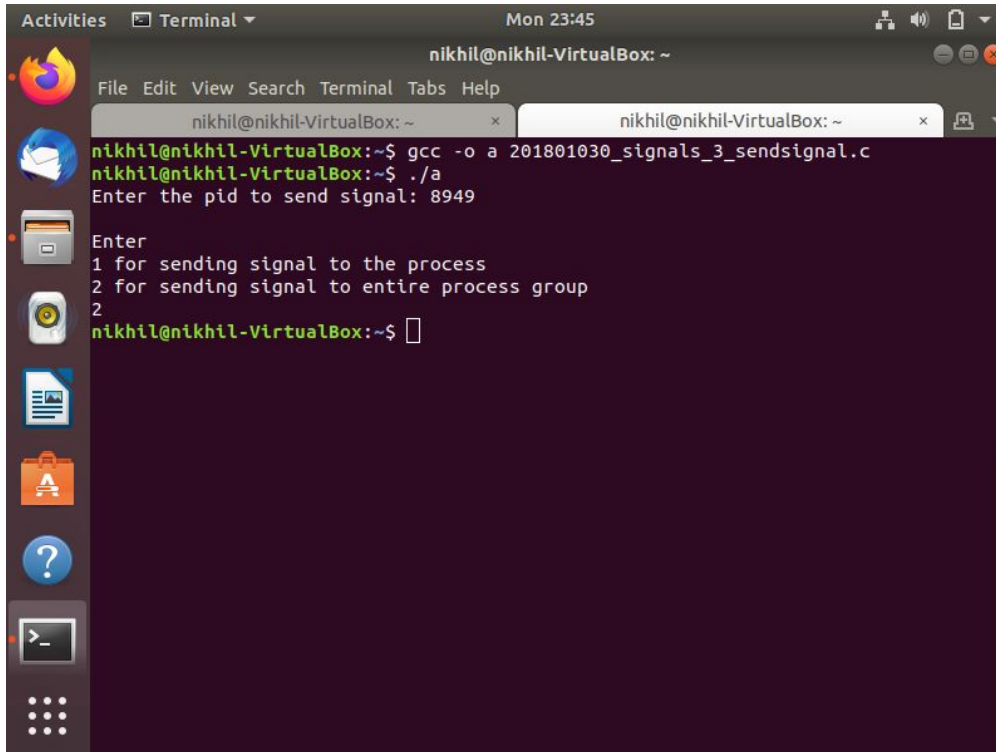
Enter
1 for sending signal to the process
2 for sending signal to entire process group
1
nikhil@nikhil-VirtualBox:~$
```



A terminal window titled "nikhil@nikhil-VirtualBox: ~" showing the execution of a program. The user enters the command to compile a C file named "201801030_signals_3_receivesignal_samegrp.c" using gcc, resulting in an executable named "a". Then, the user runs the executable with "./a". The program outputs the process ID and group ID of the parent (8749) and the child (8750). It then outputs "Process ID 8749 received SIGINT signal." Finally, the user enters the command "ps" to show the current processes.

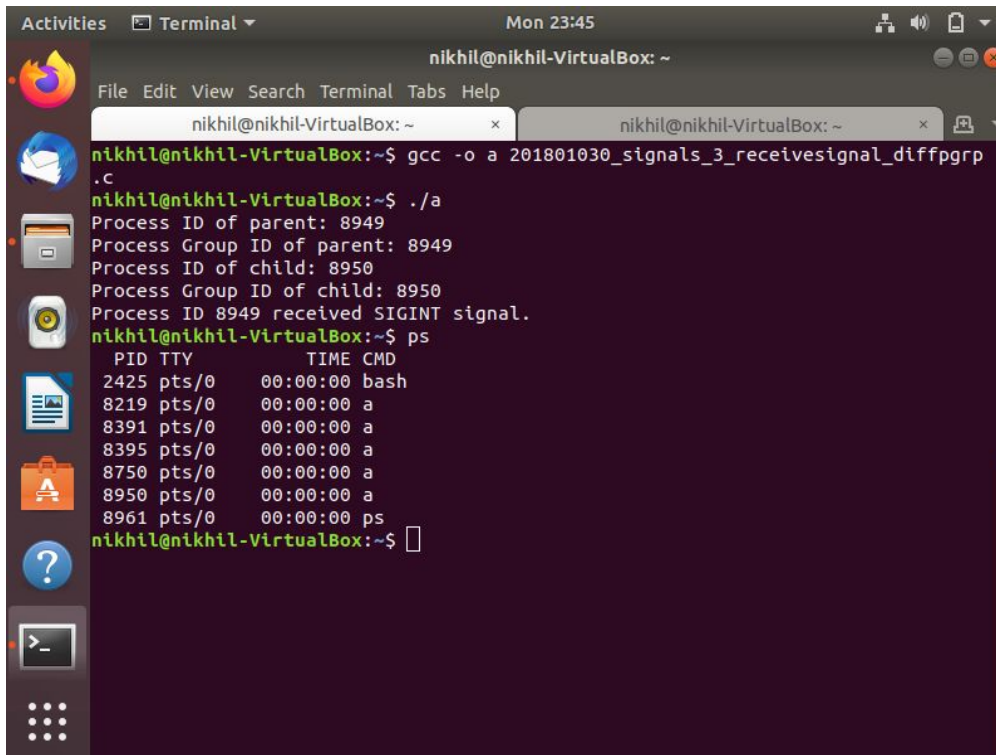
```
nikhil@nikhil-VirtualBox:~$ gcc -o a 201801030_signals_3_receivesignal_samegrp.c
nikhil@nikhil-VirtualBox:~$ ./a
Process ID of parent: 8749
Process Group ID of parent: 8749
Process ID of child: 8750
Process Group ID of child: 8749
Process ID 8749 received SIGINT signal.
nikhil@nikhil-VirtualBox:~$ ps
  PID TTY          TIME CMD
 2425 pts/0    00:00:00 bash
 8219 pts/0    00:00:00 a
 8391 pts/0    00:00:00 a
 8395 pts/0    00:00:00 a
 8750 pts/0    00:00:00 a
 8763 pts/0    00:00:00 ps
nikhil@nikhil-VirtualBox:~$
```

Q3 SIGNALS Execution-3



A terminal window titled "nikhil@nikhil-VirtualBox: ~" showing the execution of a program. The user enters the command to compile a C file named "201801030_signals_3_sendsignal.c" into an executable named "a". After running the executable, it prompts for a PID to send a signal to, with the value "8949" entered. It then asks for a choice to send the signal to either the process (1) or the entire process group (2), with "2" entered.

```
nikhil@nikhil-VirtualBox: ~  
File Edit View Search Terminal Tabs Help  
nikhil@nikhil-VirtualBox: ~  
nikhil@nikhil-VirtualBox:~$ gcc -o a 201801030_signals_3_sendsignal.c  
nikhil@nikhil-VirtualBox:~$ ./a  
Enter the pid to send signal: 8949  
  
Enter  
1 for sending signal to the process  
2 for sending signal to entire process group  
2  
nikhil@nikhil-VirtualBox:~$
```



A terminal window titled "nikhil@nikhil-VirtualBox: ~" showing the execution of a program. The user enters the command to compile a C file named "201801030_signals_3_receivesignal_diffgrp.c" into an executable named "a". After running the executable, it displays the process ID and group ID of the parent and child processes. It then shows that the parent process (PID 8949) received a SIGINT signal. Finally, the user runs the "ps" command to list the current processes.

```
nikhil@nikhil-VirtualBox: ~  
File Edit View Search Terminal Tabs Help  
nikhil@nikhil-VirtualBox: ~  
nikhil@nikhil-VirtualBox:~$ gcc -o a 201801030_signals_3_receivesignal_diffgrp.c  
nikhil@nikhil-VirtualBox:~$ ./a  
Process ID of parent: 8949  
Process Group ID of parent: 8949  
Process ID of child: 8950  
Process Group ID of child: 8950  
Process ID 8949 received SIGINT signal.  
nikhil@nikhil-VirtualBox:~$ ps  
  PID TTY          TIME CMD  
 2425 pts/0    00:00:00 bash  
 8219 pts/0    00:00:00 a  
 8391 pts/0    00:00:00 a  
 8395 pts/0    00:00:00 a  
 8750 pts/0    00:00:00 a  
 8950 pts/0    00:00:00 a  
 8961 pts/0    00:00:00 ps  
nikhil@nikhil-VirtualBox:~$
```

