

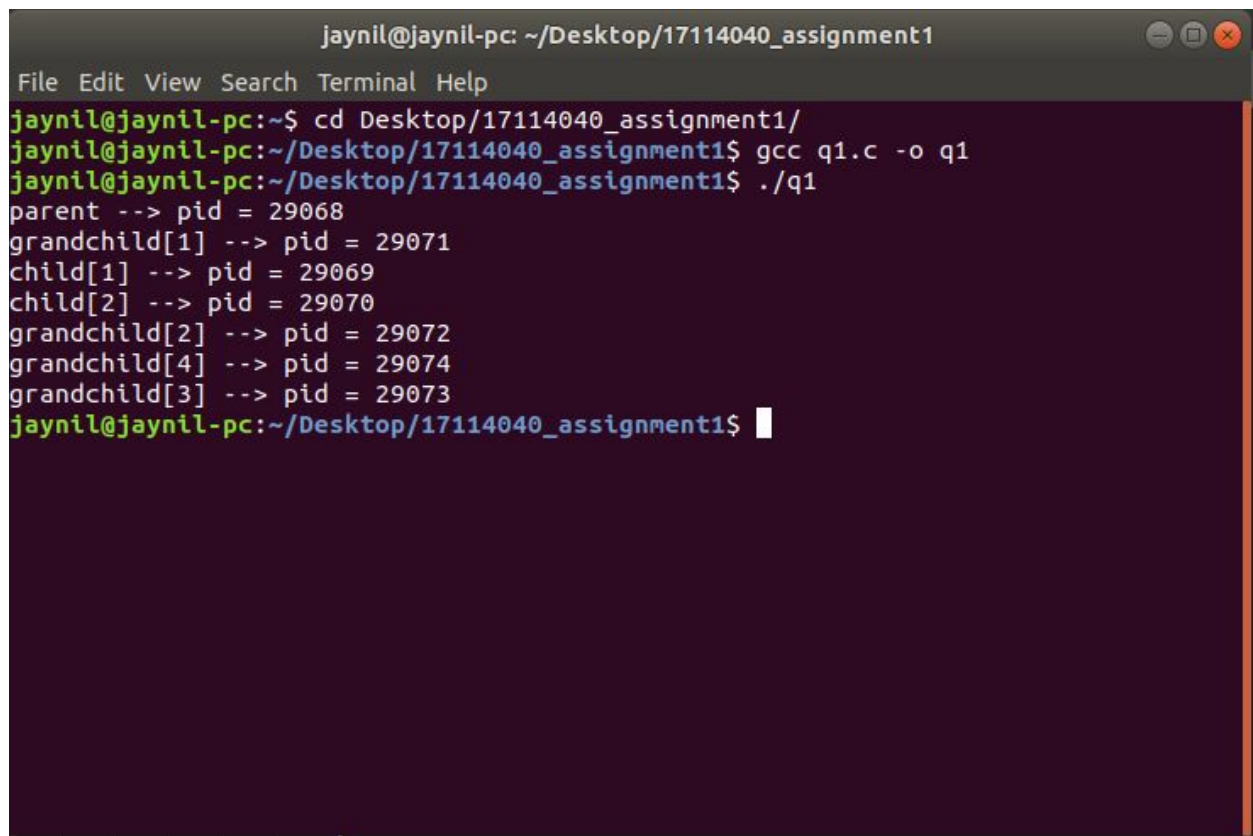
# Lab Assignment 1

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## Question 1:

Write a C program in UNIX system that creates two children and 4 grandchildren. The program should then print PID of all the processes.



```
jaynil@jaynil-pc: ~/Desktop/17114040_assignment1
File Edit View Search Terminal Help
jaynil@jaynil-pc:~$ cd Desktop/17114040_assignment1/
jaynil@jaynil-pc:~/Desktop/17114040_assignment1$ gcc q1.c -o q1
jaynil@jaynil-pc:~/Desktop/17114040_assignment1$ ./q1
parent --> pid = 29068
grandchild[1] --> pid = 29071
child[1] --> pid = 29069
child[2] --> pid = 29070
grandchild[2] --> pid = 29072
grandchild[4] --> pid = 29074
grandchild[3] --> pid = 29073
jaynil@jaynil-pc:~/Desktop/17114040_assignment1$
```

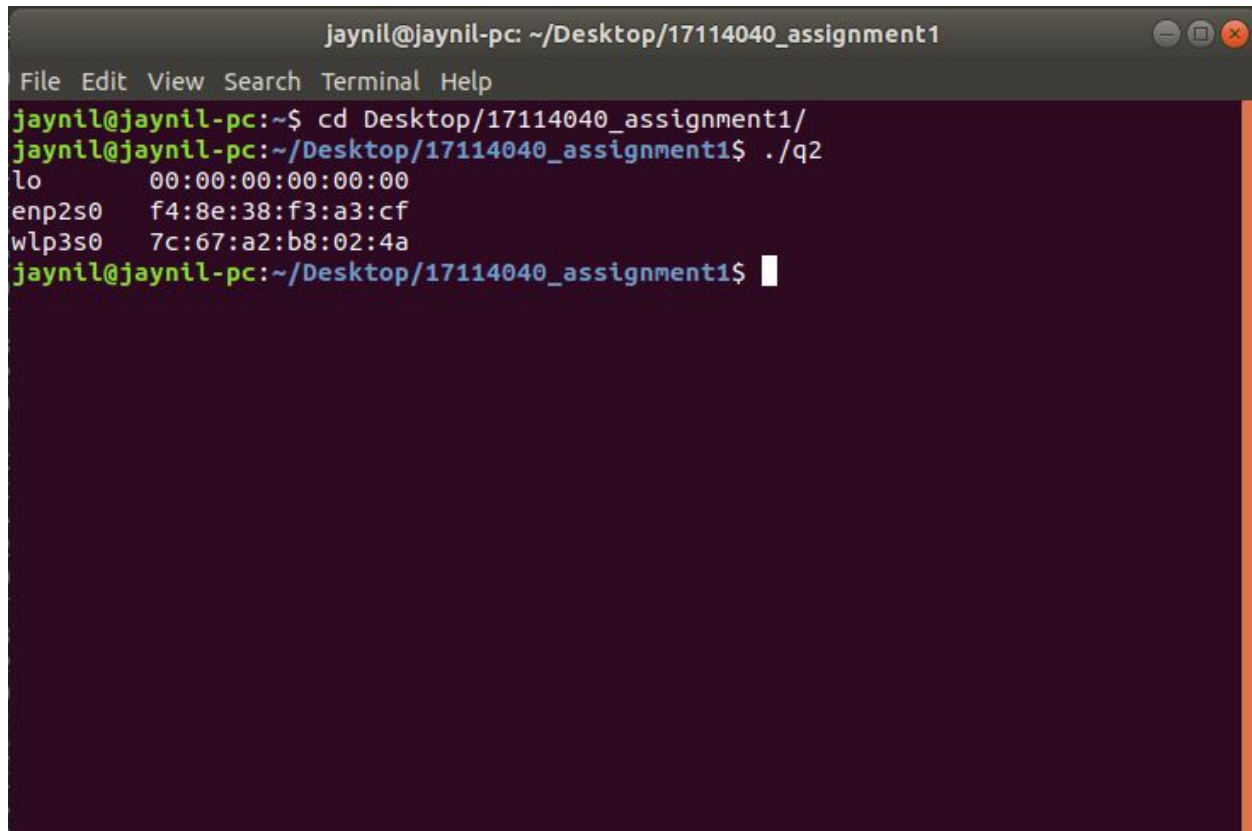
Use of if-else control flow statements are used with fork() to create 2 grandchildren of each child process.

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## Question 2:

Write a C++ program to print the MAC address of your computer.

A terminal window titled 'jaynil@jaynil-pc: ~/Desktop/17114040\_assignment1' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the following commands and output:

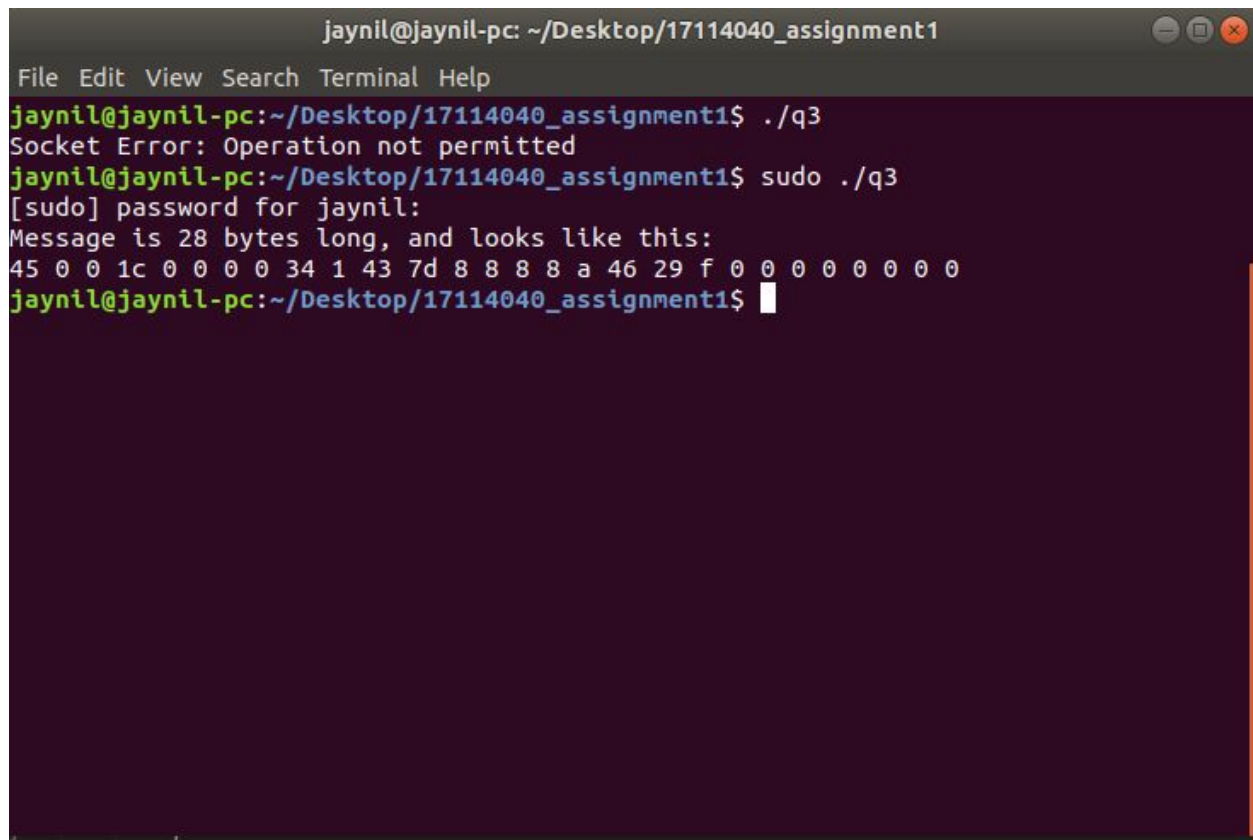
```
jaynil@jaynil-pc:~$ cd Desktop/17114040_assignment1/
jaynil@jaynil-pc:~/Desktop/17114040_assignment1$ ./q2
lo          00:00:00:00:00:00
enp2s0     f4:8e:38:f3:a3:cf
wlp3s0     7c:67:a2:b8:02:4a
jaynil@jaynil-pc:~/Desktop/17114040_assignment1$
```

“ifaddrs” data structure is used to create null pointers. Also “sockaddr\_ll” data structure is used to create socket.

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### Question 3:

Write your version of ping program in C language.

A terminal window titled 'jaynil@jaynil-pc: ~/Desktop/17114040\_assignment1' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the execution of a program named 'q3'. The first run fails with 'Socket Error: Operation not permitted'. The second run is preceded by 'sudo', and the user's password 'jaynil' is entered. The program then outputs a message: 'Message is 28 bytes long, and looks like this:' followed by a hexadecimal string: '45 0 0 1c 0 0 0 0 34 1 43 7d 8 8 8 8 a 46 29 f 0 0 0 0 0 0 0 0'.

```
jaynil@jaynil-pc: ~/Desktop/17114040_assignment1
File Edit View Search Terminal Help
jaynil@jaynil-pc:~/Desktop/17114040_assignment1$ ./q3
Socket Error: Operation not permitted
jaynil@jaynil-pc:~/Desktop/17114040_assignment1$ sudo ./q3
[sudo] password for jaynil:
Message is 28 bytes long, and looks like this:
45 0 0 1c 0 0 0 0 34 1 43 7d 8 8 8 8 a 46 29 f 0 0 0 0 0 0 0 0
jaynil@jaynil-pc:~/Desktop/17114040_assignment1$
```

**Following data structures are used:**

icmp\_hdr\_t

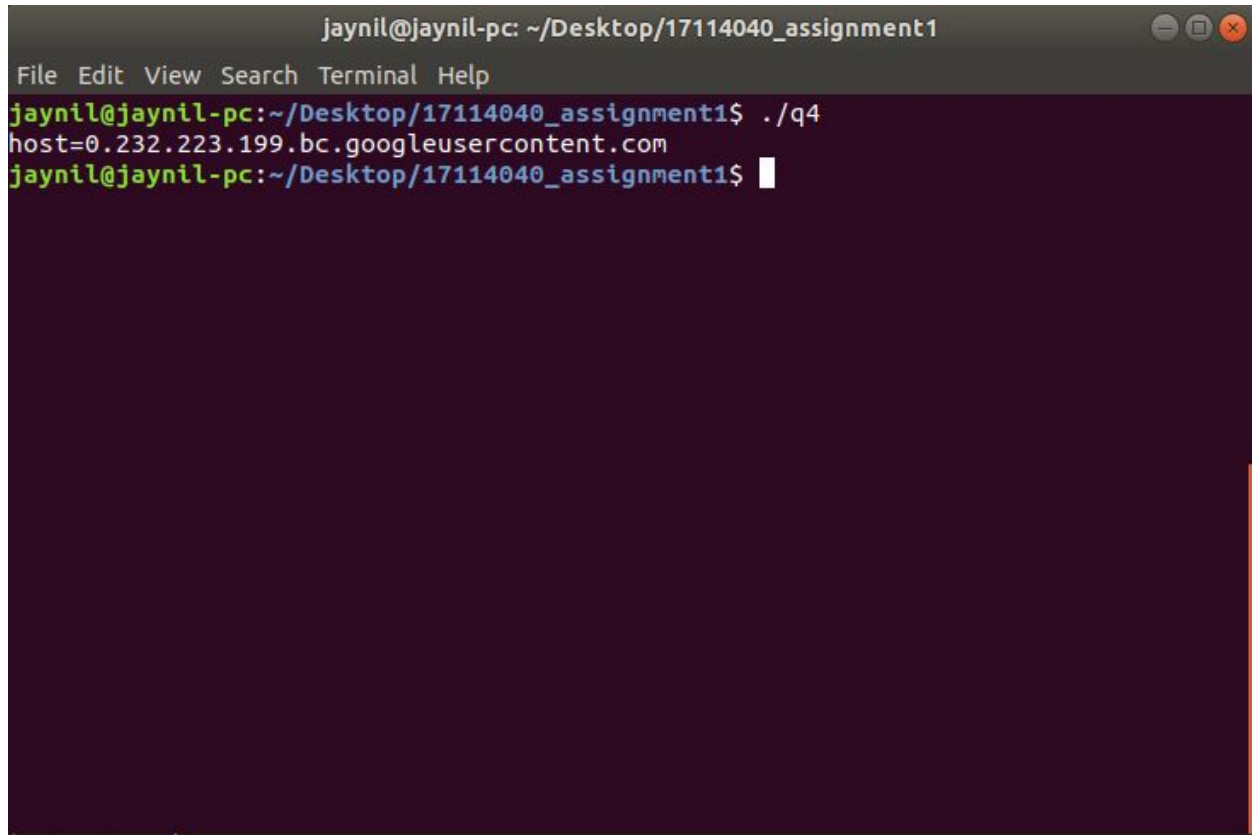
Sockaddr\_in

sockaddr

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### Question 4:

Write a C program to find the host name from IP address.

A terminal window titled 'jaynil@jaynil-pc: ~/Desktop/17114040\_assignment1'. The terminal shows a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The prompt is 'jaynil@jaynil-pc:~/Desktop/17114040\_assignment1\$'. The user enters './q4', and the output is 'host=0.232.223.199.bc.googleusercontent.com'. The prompt returns to 'jaynil@jaynil-pc:~/Desktop/17114040\_assignment1\$' with a cursor.

```
jaynil@jaynil-pc: ~/Desktop/17114040_assignment1
File Edit View Search Terminal Help
jaynil@jaynil-pc:~/Desktop/17114040_assignment1$ ./q4
host=0.232.223.199.bc.googleusercontent.com
jaynil@jaynil-pc:~/Desktop/17114040_assignment1$
```

**Following data structures are used:**

sockaddr

sockaddr\_in