CSN-361

Assignment 1

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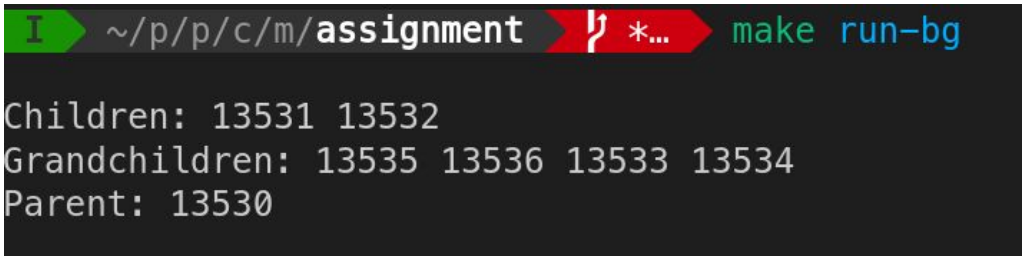
Problem Statement 1

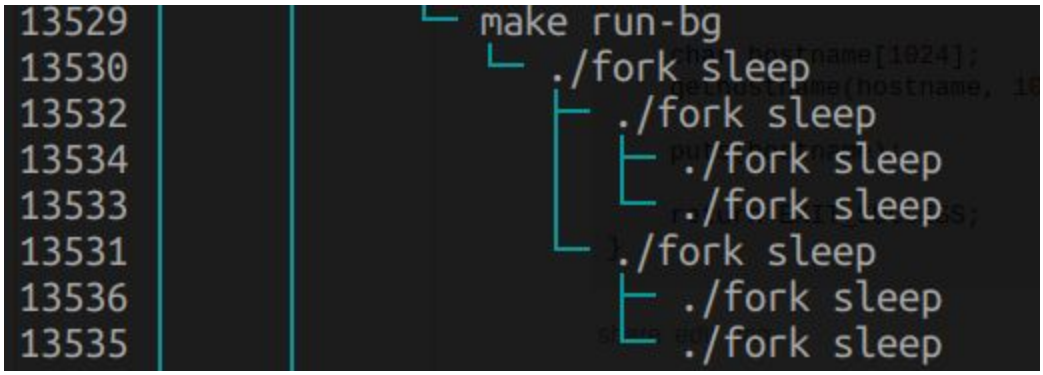
Write a C program in the UNIX system that creates two children and four grandchildren (two for each child). The program should then print the process-IDs of the two children, four grandchildren and the parent in this order.

First run make to build the program.

Then run make run-bg to run the program in background mode.

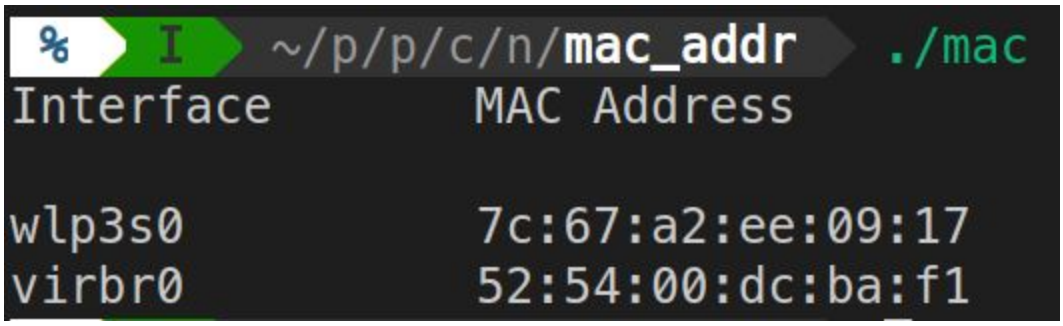


The state of running parent, children and grandchildren processes can be visualised inside the htop utility.



Problem Statement 2

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



The loop to get all active interfaces.

```
while (temp_addr != NULL) {

            if (temp_addr->ifa_addr->sa_family == AF_INET)

            {

                iface_list.push_back(temp_addr->ifa_name);

            }

            temp_addr = temp_addr->ifa_next;

}
```

Problem Statement 3

Write your own version of ping program in C language.

```
~/p/p/c/n/ping  gcc ping.c -o ping; sudo ./ping google.com
Resolving DNS..

Trying to connect to 'google.com' IP: 172.217.167.46

Reverse Lookup domain: del03s16-in-f14.1e100.net
Socket file descriptor 3 received

Socket set to TTL..
64 bytes from del03s16-in-f14.1e100.net (h: google.com) (172.217.167.46) msg_seq =  1 ttl =  64rtt =  536.831489 ms.
64 bytes from del03s16-in-f14.1e100.net (h: google.com) (172.217.167.46) msg_seq =  2 ttl =  64rtt =  208.731385 ms.
64 bytes from del03s16-in-f14.1e100.net (h: google.com) (172.217.167.46) msg_seq =  3 ttl =  64rtt =  385.394611 ms.
64 bytes from del03s16-in-f14.1e100.net (h: google.com) (172.217.167.46) msg_seq =  4 ttl =  64rtt =  73.733593 ms.
64 bytes from del03s16-in-f14.1e100.net (h: google.com) (172.217.167.46) msg_seq =  5 ttl =  64rtt =  558.676104 ms.

Packet receive failed!
64 bytes from del03s16-in-f14.1e100.net (h: google.com) (172.217.167.46) msg_seq =  7 ttl =  64rtt =  0.081155 ms.
64 bytes from del03s16-in-f14.1e100.net (h: google.com) (172.217.167.46) msg_seq =  8 ttl =  64rtt =  0.080750 ms.
64 bytes from del03s16-in-f14.1e100.net (h: google.com) (172.217.167.46) msg_seq =  9 ttl =  64rtt =  0.077011 ms.
64 bytes from del03s16-in-f14.1e100.net (h: google.com) (172.217.167.46) msg_seq =  10 ttl =  64rtt =  0.080812 ms.
^C64 bytes from del03s16-in-f14.1e100.net (h: google.com) (172.217.167.46) msg_seq =  11 ttl =  64rtt =  0.038947 ms.

===172.217.167.46 ping statistics===

11 packets sent, 10 packets received, 0.000000 percent packet loss.Total time:  13506.851804 ms.
```

Set packet type to ICMP_ECHO

```
pckt.hdr.type = ICMP_ECHO;
```

Send and receive functions

```
sendto(ping_sockfd, &pckt, sizeof(pckt), 0, (struct sockaddr *)ping_addr,
sizeof(*ping_addr));

recvfrom(ping_sockfd, &pckt, sizeof(pckt), 0, (struct sockaddr *)&r_addr,
&addr_len);
```

Problem Statement 4

Write a C program to find the host name and the IP address of your computer.

```
I ~/p/p/c/n/hostip gcc host_ip.c -o host_ip; ./host_ip
Hostname: skynet
Host IP: 10.70.16.251
```

Get hostname

```
    char hostbuffer[256];

    struct hostent *host_entry;

    int hostname;

    hostname = gethostname(hostbuffer, sizeof(hostbuffer));

    checkHostName(hostname);

    host_entry = gethostbyname(hostbuffer);

    checkHostEntry(host_entry);
```

Get IP Address

```
    struct ifaddrs *id, *tmp_addr;


    getifaddrs(&id);
```