

INHA UNIVERSITY TASHKENT

DEPARTMENT OF CSE & ICE

FALL SEMESTER 2017

SOC 3010 - OPERATING SYSTEM

HOME ASSIGNMENT 1

Submitted by

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Group : CSE-15-1

Junior



INSTRUCTIONS :

- All Home assignments are to be completed in groups
- Screen shots are to be provided wherever necessary
- Home Assignment Report should be prepared using this Template provided
- One Hard Copy of the Home Assignment of each group should be handed in at the office by the Group Leader.
- Every member of the team must upload the softcopy of the report at the E-Class portal
- Last date for submission of the Home Assignment is 10th October 2017
- Late submissions are not entertained, Adhere to the deadline strictly
- **READ THE QUESTIONS CORRECTLY & CAREFULLY**

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PART 1: PRACTICE QUESTIONS

1A. UNDERSTANDING UNIX/LINUX COMMANDS

1.	ls	list files in a directory	
	ls -la	write out all directory entries in long format	<pre>ulugbekna@yoga:~/Dropbox/IUT\$ ls CA Finished IBA Letter.docx OS Ph SA whoami - print ulugbekna@yoga:~/Dropbox/IUT\$ ls -la total 80 drwxr-xr-x 8 ulugbekna ulugbekna 4096 Okt 1 18:37 . drwx----- 11 ulugbekna ulugbekna 4096 Okt 1 18:36 .. drwxr-xr-x 2 ulugbekna ulugbekna 4096 Sen 29 03:50 CA drwxr-xr-x 11 ulugbekna ulugbekna 4096 Okt 1 18:36 Finished drwxr-xr-x 2 ulugbekna ulugbekna 4096 Okt 1 18:40 IBA -rw-r--r-- 1 ulugbekna ulugbekna 12749 Mar 29 2016 Letter. drwxr-xr-x 4 ulugbekna ulugbekna 4096 Okt 9 13:50 OS drwxr-xr-x 2 ulugbekna ulugbekna 4096 Sen 29 03:50 Ph drwxr-xr-x 3 ulugbekna ulugbekna 4096 Okt 2 22:48 SA ulugbekna@yoga:~/Dropbox/IUT\$ pwd /home/ulugbekna/Dropbox/IUT ulugbekna@yoga:~/Dropbox/IUT\$ cd OS ulugbekna@yoga:~/Dropbox/IUT/OS\$ ls first_file HW1 Lectures</pre>
2.	pwd	print working directory	
3.	cd	change directory	
4.	cat	concatenate and print the content of files	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS\$ cat >new\ file Swag file haha. It's a great file.ulugbekna@yoga:~/Dropbox/IUT/OS\$ cat new\ file Swag file haha. It's a great file.ulugbekna@yoga:~/Dropbox/IUT/OS\$</pre>
5.	cp	copy one or more files to another directory	
6.	mv	move or rename directories or files	
7.	who	print all usernames currently logged in	
8.	whoami	print the current user id and name	
9.	ps	list the processes running	
10.	ps -la	list the running processes in long format and including those with names starting with period	<pre>first_file HW1 Lectures second_file ulugbekna@yoga:~/Dropbox/IUT/OS\$ cp first_file Lectures ulugbekna@yoga:~/Dropbox/IUT/OS\$ ls first_file HW1 Lectures second_file ulugbekna@yoga:~/Dropbox/IUT/OS\$ cd Lectures ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ ls 1-1.pdf 1-2.pdf 1-3.pdf 2-1.pdf 2-2.pdf 2-3.pdf first_file ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ mv ..second_file . ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ ls 1-1.pdf 1-2.pdf 1-3.pdf 2-1.pdf 2-2.pdf 2-3.pdf first_file second_file ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ cd .. ulugbekna@yoga:~/Dropbox/IUT/OS\$ ls first_file HW1 Lectures ulugbekna@yoga:~/Dropbox/IUT/OS\$ who ulugbekna tty7 2017-10-09 10:37 (:) ulugbekna@yoga:~/Dropbox/IUT/OS\$ whoami ulugbekna ulugbekna@yoga:~/Dropbox/IUT/OS\$ ps PID TTY TIME CMD 26562 pts/0 00:00:00 bash 27649 pts/0 00:00:00 ps ulugbekna@yoga:~/Dropbox/IUT/OS\$ ps -la F S UID PID PPI C PRI NI ADDR SZ WCHAN TTY TIME CMD 4 R 1000 27650 26562 0 80 0 - 8214 - pts/0 00:00:00 ps ulugbekna@yoga:~/Dropbox/IUT/OS\$ more first_file</pre>
11.	more	display output one screen at a time; unable to scroll back in screens	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS\$ more first_file This assignment is fascinating. ulugbekna@yoga:~/Dropbox/IUT/OS\$ less first_file</pre>
12.	less	display output one screen at a time; able to scroll back in screens and has much more functionality than 'more' command	<p style="text-align: center;">This assignment is fascinating. first_file (END)</p>
13.	head	output beginning of a file	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ head first_file This assignment is fascinating. ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ tail first_file This assignment is fascinating.</pre>
14.	tail	output ending of a file	
15.	fg	starts a suspended process running in the foreground	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ fg less first_file (wd: ~/Dropbox/IUT/OS) [2]+ Stopped less first_file (wd: ~/Dropbox/IUT/OS) (wd now: ~/Dropbox/IUT/OS/Lectures)</pre>

16.	rm	deletes a file	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ ls 1-1.pdf 1-2.pdf 1-3.pdf 2-1.pdf 2-2.pdf 2-3.pdf first_file second_file ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ rm first_file ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ ls 1-1.pdf 1-2.pdf 1-3.pdf 2-1.pdf 2-2.pdf 2-3.pdf second_file ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ mkdir Week\ 1 ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ ls 1-1.pdf 1-2.pdf 1-3.pdf 2-1.pdf 2-2.pdf 2-3.pdf second_file Week\ 1</pre>
17.	mkdir	creates a new directory with the given name	
18.	rmdir	removes a directory with the given name	
19.	date	outputs the current date/time	
20.	sudo	execute a single command as a super user	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ rmdir Week\ 1 ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ ls 1-1.pdf 1-2.pdf 1-3.pdf 2-1.pdf 2-2.pdf 2-3.pdf second_file ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ date 09 Oktjabr, 2017 yil, Dushanba ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ sudo usage: sudo -h [-K -k -V] [command] ... usage: sudo -v [-AknS] [-g group] [-h host] [-p prompt] [-u user] [command] ... usage: sudo -l [-AknS] [-g group] [-h host] [-p prompt] [-U user] [-u user] [command] ... usage: sudo [-AbEHknPS] [-r role] [-t type] [-C num] [-g group] [-h host] [command] ... usage: sudo -e [-AknS] [-r role] [-t type] [-C num] [-g group] [-h host] [command] ... ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ sudo apt-get install vim [sudo] password for ulugbekna: Reading package lists... Done Building dependency tree Reading state information... Done The following additional packages will be installed: vim-runtime Suggested packages: ctags vim-doc vim-scripts The following NEW packages will be installed: apt-get - search for and install vim vim-runtime 0 upgraded, 2 newly installed, 0 to remove and 4 not upgraded. Need to get 6,371 kB of archives. After this operation, 30.8 MB of additional disk space will be used. Do you want to continue? [Y/n] n</pre>
21.	apt-get	search for and install a software package	
22.	chmod	change the access permissions of a file or a group of files	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ ls -la total 10748 drwxr-xr-x 2 ulugbekna ulugbekna 4096 Okt 9 14:26 . drwxr-xr-x 4 ulugbekna ulugbekna 4096 Okt 9 14:23 .. -rw-r--r-- 1 ulugbekna ulugbekna 1926231 Okt 9 10:40 1-1.pdf -rw-r--r-- 1 ulugbekna ulugbekna 1554047 Okt 9 10:40 1-2.pdf -rw-r--r-- 1 ulugbekna ulugbekna 3957601 Okt 9 10:42 1-3.pdf -rw-r--r-- 1 ulugbekna ulugbekna 954329 Okt 9 10:41 2-1.pdf -rw-r--r-- 1 ulugbekna ulugbekna 1367338 Okt 9 13:51 2-2.pdf -rw-r--r-- 1 ulugbekna ulugbekna 1185692 Okt 9 13:51 2-3.pdf -rw-r--r-- 1 ulugbekna ulugbekna 1 Okt 9 14:17 second_file ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ chmod -777 second_file ulugbekna@yoga:~/Dropbox/IUT/OS/Lectures\$ ls -la</pre>
23.	echo	outputs a message or a value	
24.	find	search for files by name within a given directory	
25.	free	display memory usage	
26.	diff	display differences between two files	
27.	grep	search a file for a given string or expression	
28.	passwd	change your password	
29.	wc	output number of chars, lines, words in a file	

30.	man	help manual	
31.	sort	sort text files	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS\$ sort first second line 1 line 1 line 2 line 2 line 3 line 3</pre>
32.	cmp	compare two files	
33.	bg	run a process in the background	
34.	file	determine file type	
35.	time	measure program running time	
36.	kill	kill a process with a specific PID	
37.	link	create a link to a file	
38.	uname	print the system information	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS\$ file first first: ASCII text ulugbekna@yoga:~/Dropbox/IUT/OS\$ ps aux PID TTY TIME CMD 26562 pts/0 00:00:00 bash 28894 pts/0 00:00:00 bash 28969 pts/0 00:00:00 ps ulugbekna@yoga:~/Dropbox/IUT/OS\$ kill -9 28894 Killed real 1m35.235s user 0m0.784s sys 0m0.292s ulugbekna@yoga:~/Dropbox/IUT/OS\$ ps aux PID TTY TIME CMD 26562 pts/0 00:00:00 bash 28986 pts/0 00:00:00 ps ulugbekna@yoga:~/Dropbox/IUT/OS\$ ls first HW1 Lectures second ulugbekna@yoga:~/Dropbox/IUT/OS\$ link second fi ulugbekna@yoga:~/Dropbox/IUT/OS\$ ls fi first HW1 Lectures second ulugbekna@yoga:~/Dropbox/IUT/OS\$ fi bash: syntax error near unexpected token `fi' ulugbekna@yoga:~/Dropbox/IUT/OS\$ cat fi line 1 line 2 line 3 line 4ulugbekna@yoga:~/Dropbox/IUT/OS\$ cat second line 1 line 2 line 3 line 4ulugbekna@yoga:~/Dropbox/IUT/OS\$ cmp fi second </pre>
39.	df	display free disk space	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS\$ df Filesystem 1K-blocks Used Available Use% Mounted on udev 1953072 0 1953072 0% /dev</pre>

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40.	du	estimate file space usage																																																																																																																																																																																																																																																	
41.	chown	change file owner or group																																																																																																																																																																																																																																																	
42.	chgrp	change group ownership																																																																																																																																																																																																																																																	
43.	adduser	adds a user	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS\$ sudo adduser temporary_user Adding user `temporary_user' ... Adding new group `temporary_user' (1002) ... Adding new user `temporary_user' (1002) with group Creating home directory `/home/temporary_user' ... Copying files from `/etc/skel' ... Enter new UNIX password: Retype new UNIX password:</pre>																																																																																																																																																																																																																																																
44.	addgroup	adds a group	<pre>Removing user `temporary_user' ... Warning: group `temporary_user' has no more members. Done.</pre>																																																																																																																																																																																																																																																
45.	deluser	deletes a user	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS\$ sudo addgroup temp_group Adding group `temp_group' (GID 1002) ... Done.</pre>																																																																																																																																																																																																																																																
46.	delgroup	deletes a group	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS\$ sudo delgroup temp_group Removing group `temp_group' ... Done.</pre>																																																																																																																																																																																																																																																
47.	touch	update the last-modified time of a user	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS\$ ls file first HW1 Lectures second ulugbekna@yoga:~/Dropbox/IUT/OS\$ ls -la total 56 drwxr-xr-x 4 ulugbekna ulugbekna 4096 Okt 9 16 drwxr-xr-x 8 ulugbekna ulugbekna 4096 Okt 1 18 -rw-r--r-- 2 ulugbekna ulugbekna 27 Okt 9 14 -rw-r--r-- 1 ulugbekna ulugbekna 38 Okt 9 14 drwxr-xr-x 4 ulugbekna ulugbekna 4096 Okt 9 16 drwxr-xr-x 2 ulugbekna ulugbekna 4096 Okt 9 16 -rw-r--r-- 2 ulugbekna ulugbekna 27 Okt 9 14 ulugbekna@yoga:~/Dropbox/IUT/OS\$ touch second ulugbekna@yoga:~/Dropbox/IUT/OS\$ ls -la total 56 drwxr-xr-x 4 ulugbekna ulugbekna 4096 Okt 9 16 drwxr-xr-x 8 ulugbekna ulugbekna 4096 Okt 1 18 -rw-r--r-- 2 ulugbekna ulugbekna 27 Okt 9 16 -rw-r--r-- 1 ulugbekna ulugbekna 38 Okt 9 14 drwxr-xr-x 4 ulugbekna ulugbekna 4096 Okt 9 16 drwxr-xr-x 2 ulugbekna ulugbekna 4096 Okt 9 16 -rw-r--r-- 2 ulugbekna ulugbekna 27 Okt 9 14 ulugbekna@yoga:~/Dropbox/IUT/OS\$ touch second ulugbekna@yoga:~/Dropbox/IUT/OS\$ ls -la total 56 drwxr-xr-x 4 ulugbekna ulugbekna 4096 Okt 9 16 drwxr-xr-x 8 ulugbekna ulugbekna 4096 Okt 1 18 -rw-r--r-- 2 ulugbekna ulugbekna 27 Okt 9 16 -rw-r--r-- 1 ulugbekna ulugbekna 38 Okt 9 14 drwxr-xr-x 4 ulugbekna ulugbekna 4096 Okt 9 16 drwxr-xr-x 2 ulugbekna ulugbekna 4096 Okt 9 16 -rw-r--r-- 2 ulugbekna ulugbekna 27 Okt 9 14</pre>																																																																																																																																																																																																																																																
48.	top	display what processes are consuming the most CPU/memory and output system CPU/memory stats	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS\$ top top - 16:23:11 up 5:47, 1 user, load average: 2.55, 1.79, 1.38 Tasks: 250 total, 1 running, 249 sleeping, 0 stopped, 0 zombie %Cpu(s): 43.0 us, 9.5 sy, 0.0 ni, 42.4 id, 5.0 wa, 0.0 hi, 0.1 si, 0.0 st KiB Mem : 3951784 total, 229328 free, 2604740 used, 1117116 buff/cache KiB Swap: 1953788 total, 429776 free, 1524012 used, 266328 avail Mem</pre> <table border="1"> <thead> <tr> <th>PID</th> <th>USER</th> <th>PR</th> <th>NI</th> <th>VIRT</th> <th>RES</th> <th>SHR</th> <th>S</th> <th>%CPU</th> <th>%MEM</th> <th>TIME+</th> <th>COMMAND</th> </tr> </thead> <tbody> <tr><td>2254</td><td>ulugbek+</td><td>20</td><td>0</td><td>1495144</td><td>205060</td><td>48824</td><td>S</td><td>73.2</td><td>5.2</td><td>60:39.95</td><td>chrome</td></tr> <tr><td>2430</td><td>ulugbek+</td><td>20</td><td>0</td><td>1031976</td><td>95916</td><td>18828</td><td>S</td><td>37.4</td><td>2.4</td><td>52:00.63</td><td>chrome</td></tr> <tr><td>2330</td><td>ulugbek+</td><td>20</td><td>0</td><td>711472</td><td>189484</td><td>149800</td><td>S</td><td>36.4</td><td>4.8</td><td>28:12.40</td><td>chrome</td></tr> <tr><td>1822</td><td>ulugbek+</td><td>20</td><td>0</td><td>1614816</td><td>114976</td><td>19532</td><td>S</td><td>26.8</td><td>2.9</td><td>20:32.60</td><td>compirz</td></tr> <tr><td>1046</td><td>root</td><td>20</td><td>0</td><td>1419512</td><td>223992</td><td>184744</td><td>S</td><td>13.9</td><td>5.7</td><td>12:28.81</td><td>Xorg</td></tr> <tr><td>31589</td><td>ulugbek+</td><td>20</td><td>0</td><td>441496</td><td>23460</td><td>19280</td><td>S</td><td>5.6</td><td>0.6</td><td>0:00.17</td><td>gnome-screensho</td></tr> <tr><td>2539</td><td>ulugbek+</td><td>20</td><td>0</td><td>1038460</td><td>54220</td><td>14568</td><td>S</td><td>1.7</td><td>1.4</td><td>3:09.44</td><td>chrome</td></tr> <tr><td>1524</td><td>ulugbek+</td><td>20</td><td>0</td><td>374680</td><td>6640</td><td>1098</td><td>S</td><td>1.0</td><td>0.2</td><td>0:49.03</td><td>ibus-daemon</td></tr> <tr><td>1539</td><td>ulugbek+</td><td>20</td><td>0</td><td>492596</td><td>6964</td><td>2704</td><td>S</td><td>0.7</td><td>0.2</td><td>0:12.31</td><td>ibus-ui-gtk3</td></tr> <tr><td>1665</td><td>ulugbek+</td><td>20</td><td>0</td><td>556064</td><td>3232</td><td>1936</td><td>S</td><td>0.7</td><td>0.1</td><td>0:10.28</td><td>indicator-sound</td></tr> <tr><td>1835</td><td>ulugbek+</td><td>20</td><td>0</td><td>679316</td><td>30732</td><td>7112</td><td>S</td><td>0.7</td><td>0.8</td><td>0:37.33</td><td>unity-panel-ser</td></tr> <tr><td>31292</td><td>root</td><td>20</td><td>0</td><td>0</td><td>0</td><td>0</td><td>S</td><td>0.7</td><td>0.0</td><td>0:01.24</td><td>kworker/u16:1</td></tr> <tr><td>31568</td><td>ulugbek+</td><td>20</td><td>0</td><td>45904</td><td>4152</td><td>3416</td><td>R</td><td>0.7</td><td>0.1</td><td>0:00.20</td><td>top</td></tr> <tr><td>8</td><td>root</td><td>20</td><td>0</td><td>0</td><td>0</td><td>0</td><td>S</td><td>0.3</td><td>0.0</td><td>0:28.58</td><td>rcu_sched</td></tr> <tr><td>186</td><td>root</td><td>0</td><td>-20</td><td>0</td><td>0</td><td>0</td><td>S</td><td>0.3</td><td>0.0</td><td>0:01.93</td><td>kworker/0:1H</td></tr> <tr><td>242</td><td>root</td><td>20</td><td>0</td><td>59604</td><td>4592</td><td>4244</td><td>S</td><td>0.3</td><td>0.1</td><td>0:08.38</td><td>systemd-journal</td></tr> <tr><td>358</td><td>root</td><td>-51</td><td>0</td><td>0</td><td>0</td><td>0</td><td>S</td><td>0.3</td><td>0.0</td><td>0:37.53</td><td>irq/45-twlwifi</td></tr> <tr><td>1434</td><td>ulugbek+</td><td>20</td><td>0</td><td>46856</td><td>1728</td><td>0</td><td>S</td><td>0.3</td><td>0.0</td><td>0:25.18</td><td>dbus-daemon</td></tr> <tr><td>1581</td><td>ulugbek+</td><td>20</td><td>0</td><td>214288</td><td>324</td><td>0</td><td>S</td><td>0.3</td><td>0.0</td><td>0:12.09</td><td>ibus-engine-sim</td></tr> </tbody> </table>	PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND	2254	ulugbek+	20	0	1495144	205060	48824	S	73.2	5.2	60:39.95	chrome	2430	ulugbek+	20	0	1031976	95916	18828	S	37.4	2.4	52:00.63	chrome	2330	ulugbek+	20	0	711472	189484	149800	S	36.4	4.8	28:12.40	chrome	1822	ulugbek+	20	0	1614816	114976	19532	S	26.8	2.9	20:32.60	compirz	1046	root	20	0	1419512	223992	184744	S	13.9	5.7	12:28.81	Xorg	31589	ulugbek+	20	0	441496	23460	19280	S	5.6	0.6	0:00.17	gnome-screensho	2539	ulugbek+	20	0	1038460	54220	14568	S	1.7	1.4	3:09.44	chrome	1524	ulugbek+	20	0	374680	6640	1098	S	1.0	0.2	0:49.03	ibus-daemon	1539	ulugbek+	20	0	492596	6964	2704	S	0.7	0.2	0:12.31	ibus-ui-gtk3	1665	ulugbek+	20	0	556064	3232	1936	S	0.7	0.1	0:10.28	indicator-sound	1835	ulugbek+	20	0	679316	30732	7112	S	0.7	0.8	0:37.33	unity-panel-ser	31292	root	20	0	0	0	0	S	0.7	0.0	0:01.24	kworker/u16:1	31568	ulugbek+	20	0	45904	4152	3416	R	0.7	0.1	0:00.20	top	8	root	20	0	0	0	0	S	0.3	0.0	0:28.58	rcu_sched	186	root	0	-20	0	0	0	S	0.3	0.0	0:01.93	kworker/0:1H	242	root	20	0	59604	4592	4244	S	0.3	0.1	0:08.38	systemd-journal	358	root	-51	0	0	0	0	S	0.3	0.0	0:37.53	irq/45-twlwifi	1434	ulugbek+	20	0	46856	1728	0	S	0.3	0.0	0:25.18	dbus-daemon	1581	ulugbek+	20	0	214288	324	0	S	0.3	0.0	0:12.09	ibus-engine-sim
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2330	ulugbek+	20	0	711472	189484	149800	S	36.4	4.8	28:12.40	chrome																																																																																																																																																																																																																																								
1822	ulugbek+	20	0	1614816	114976	19532	S	26.8	2.9	20:32.60	compirz																																																																																																																																																																																																																																								
1046	root	20	0	1419512	223992	184744	S	13.9	5.7	12:28.81	Xorg																																																																																																																																																																																																																																								
31589	ulugbek+	20	0	441496	23460	19280	S	5.6	0.6	0:00.17	gnome-screensho																																																																																																																																																																																																																																								
2539	ulugbek+	20	0	1038460	54220	14568	S	1.7	1.4	3:09.44	chrome																																																																																																																																																																																																																																								
1524	ulugbek+	20	0	374680	6640	1098	S	1.0	0.2	0:49.03	ibus-daemon																																																																																																																																																																																																																																								
1539	ulugbek+	20	0	492596	6964	2704	S	0.7	0.2	0:12.31	ibus-ui-gtk3																																																																																																																																																																																																																																								
1665	ulugbek+	20	0	556064	3232	1936	S	0.7	0.1	0:10.28	indicator-sound																																																																																																																																																																																																																																								
1835	ulugbek+	20	0	679316	30732	7112	S	0.7	0.8	0:37.33	unity-panel-ser																																																																																																																																																																																																																																								
31292	root	20	0	0	0	0	S	0.7	0.0	0:01.24	kworker/u16:1																																																																																																																																																																																																																																								
31568	ulugbek+	20	0	45904	4152	3416	R	0.7	0.1	0:00.20	top																																																																																																																																																																																																																																								
8	root	20	0	0	0	0	S	0.3	0.0	0:28.58	rcu_sched																																																																																																																																																																																																																																								
186	root	0	-20	0	0	0	S	0.3	0.0	0:01.93	kworker/0:1H																																																																																																																																																																																																																																								
242	root	20	0	59604	4592	4244	S	0.3	0.1	0:08.38	systemd-journal																																																																																																																																																																																																																																								
358	root	-51	0	0	0	0	S	0.3	0.0	0:37.53	irq/45-twlwifi																																																																																																																																																																																																																																								
1434	ulugbek+	20	0	46856	1728	0	S	0.3	0.0	0:25.18	dbus-daemon																																																																																																																																																																																																																																								
1581	ulugbek+	20	0	214288	324	0	S	0.3	0.0	0:12.09	ibus-engine-sim																																																																																																																																																																																																																																								

49.	cut	divide a file into several parts	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS\$ more second line 1 line 2 line 3 line 4 ulugbekna@yoga:~/Dropbox/IUT/OS\$ cut -c 2 second i i i i ulugbekna@yoga:~/Dropbox/IUT/OS\$ cut -c 1 second l l l l ulugbekna@yoga:~/Dropbox/IUT/OS\$ cut -b 1 second 1 2 3 4</pre>
50.	sed	stream editor; find and/or replace based on regular expressions	<pre>ulugbekna@yoga:~/Dropbox/IUT/OS\$ ls fi first HW1 Lectures second ulugbekna@yoga:~/Dropbox/IUT/OS\$ more fi line 1 line 2 line 3 line 4 ulugbekna@yoga:~/Dropbox/IUT/OS\$ sed -i "3s/.*/line replaced/" fi ulugbekna@yoga:~/Dropbox/IUT/OS\$ more fi line 1 line 2 line replaced line 4 ulugbekna@yoga:~/Dropbox/IUT/OS\$ uptime 16:55:58 up 5 min, 1 user, load average: 0.51, 0.36, 0.14</pre>
51.	uptime	show the time the system is up	

SOC 3010-OS HOME ASSIGNMENT

1B. PERFORMING FILE OPERATIONS USING UNIX I/O SYSTEM CALLS

```
/* Program using UNIX I/O primitives to perform file operations */  
/*FileName: file_oper.c*/  
  
#include <stdio.h>  
  
#include <stdlib.h>  
  
#include <sys/types.h>  
  
#include <sys/stat.h>  
  
#include <fcntl.h>  
  
#include <unistd.h>  
  
#include <string.h>  
  
  
#define DEF_MODE S_IRUSR|S_IWUSR|S_IXUSR|S_IRGRP|S_IWGRP|S_IXGRP|S_IROTH  
/*  
defining the permissions of the created file  
*/  
  
int main()  
{  
    int fd, fd1, len, i, fsize, nbytes;  
    char ch=0, cf, buf[512], fname[25], cname[25];  
  
    printf("CREATING A NEW FILE WITH ALL ACCESS RIGHTS TO USER AND GROUP AND  
EXECUTE ACCESS TO OTHERS\n");  
  
    printf("ENTER FILE NAME : ");  
    scanf("%s", fname);  
  
    fd = open(fname, O_CREAT|O_TRUNC|O_WRONLY|O_APPEND, DEF_MODE);
```

```
*****  
definition of function open() ==> open(const char*file_name, int oflags, mode_t mode)  
oflags ==> defines the method(s) in which the file should be opened. Method_flags can be  
separated by BITWISE OR |, if many.  
mode ==> defines the permissions of the file when created, can be separated by BITWISE  
OR, if many.  
O_CREAT => create the file, if doesn't exist and 3rd parameter must be present  
O_TRUNC ==> Initially clear all data from the file. It means even the file exists, data in it will  
be erased.  
O_WRONLY ==> The file is for write only.  
O_APPEND ==> Append new information to the end of the file
```

```
******/
```

```
if (fd < 0)  
{  
    printf("cannot create FILE %s \n", fname);  
}  
else  
{  
    printf("NOW ENTER YOUR PROGRAM OR TEXT LINE BY LINE- ONCE YOU  
FINISH PRESS KEYS Ctrl+D\n");  
  
    i=0;  
  
    ch = getchar();  
  
    /* to remove the last newline character entered*/  
    while ( (ch=getchar()) != EOF)  
        buf[i++]=ch;
```

```

        fsize=i-2;

        buf[fsize]='\0';

        printf("Total characters stored in your file = %d\n", fsize);
        write(fd, buf, fsize);

/*****Definition of function write(int, const void *buf, size_t nbytes) ===> write(file_descriptor,
buffer_pointer, number_of_written_bytes)*****/



        close(fd);

/*****file is closed with close(file_descriptor) function*****/


}

/*Opening an existing file*/
printf("OPENING AN EXISTING FILE\n");

printf("ENTER FILE NAME : ");
scanf("%s", fname);

fd=open(fname, O_RDWR|O_APPEND, DEF_MODE);

/*
O_RDWR ==> says open the file so that it can be read and written.

O_APPEND ==> append to the end of the file

DEF_MODE is the same
*/

```

```
if (fd < 0)
{
    printf ("cannot open FILE %s - does not exist \n", fname);
}
else
{
    printf(" READING YOUR FILE CONTENTS\n");

    nbytes=read(fd, buf, sizeof(buf));
    len=strlen(buf);

/*
Definition of function read(fd, buf, sizeof(buf))=>
fd - file_descriptor
buf(char array) - buffer for storing content of the file
sizeof(buf) - number of bytes to read before truncating data
*/
}
```

```
printf("CONTENTS OF YOUR FILE %s - size= %d\n", fname, len);
```

```
puts(buf);// printing the file content
```

```
close(fd);// file closed
```

```
}
```

Copying a file

```
*
```

```

printf("COPYING A FILE \n");

printf("ENTER NAME OF CURRENT FILE TO BE COPIED FROM :");
scanf("%s", fname);
printf("ENTER NAME OF NEW FILE NAME TO BE COPIED TO :");
scanf("%s", cname);

fd = open(fname, O_RDONLY, DEF_MODE);
/*
firstly, the file which is to be opened is opened in read-only(O_RDONLY) mode
*/
if (fd < 0)
{
    printf ("cannot open FILE %s - does not exist \n", fname);
}
else
{
    if(nbytes = read(fd, buf, sizeof(buf)) < 0) //negative number is returned if there
is a system call error
    {
        printf("FILE READ ERROR\n");
    }
    else
    {
        fd1 = open(cname, O_CREAT|O_TRUNC|O_WRONLY, DEF_MODE);
        /*
THEN new file with name cname is created
*/
    }
}

```

```

        if (fd1 < 0) // negative value is returned when an error occurs while
opening file

        {

            printf("Cannot create New file %s\n", cname);

        }

        else

        {

            len=strlen(buf);

            if( nbytes=write(fd1, buf, len) < 0) // negative value is returned
when an error occurs while writing to file

                printf("FILE WRITE ERROR\n");

            else

                printf("FILE %s has been copied to %s successfully OK
.....\n", fname,cname);

                close(fd1);

            }

            close(fd);

        }

    }

/*
Renaming a file

printf("RENAMING A FILE \n");

```

```
printf("ENTER CURRENT FILE NAME :");
scanf("%s", fname);
printf("ENTER NEW FILE NAME :");
scanf("%s", cname);
printf("FILE %s has been renamed to %s OK.....\n", fname, cname);

rename(fname, cname); /*using this function the file is renamed, fname and cname
are char arrays*/
```

```
/*
Deleting a file
*/
printf("DELETING A FILE \n");

printf("ENTER FILE NAME :");
scanf("%s", fname);

ch = getchar(); /* to remove the last newline character entered*/

printf("PLEASE CONFIRM - SURE YOU WANT TO DELETE ....PRESS y/n :");
scanf("%c", &cf);

if (cf == 'y')
{
    unlink(fname);/* using this unlink() function the the file is deleted*/
    printf("FILE %s deleted OK.....\n", fname);
}
else
{
```

```
    printf("FILE %s not deleted OK.....\n", fname);  
}  
  
}  
  
/*end_of:  
file_oper.c-----  
=====*/
```

In the code above, proper comments are provided to explain file operations and Unix i/o primitives used.

RESULTS AND SCREENSHOTS of Part1B:

In the screenshot above we can see how the file_oper.c is given to compilation and executed. And partially there is shown how the program works, using i/o operations.

```

v@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master
NOW ENTER YOUR PROGRAM OR TEXT LINE BY LINE- ONCE YOU FINISH PRESS KEYS Ctrl+D
#include<stdio.h>

int main(){

printf("hello WORLD\n");

return 0;
}
Total characters stored in your file = 72
OPENING AN EXISTING FILE
ENTER FILE NAME : myFile
READING YOUR FILE CONTENTS
CONTENTS OF YOUR FILE myFile - size= 72
#include<stdio.h>

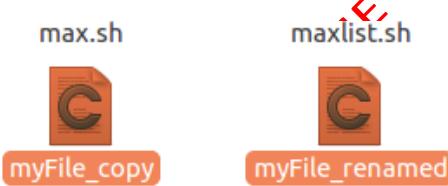
int main(){

printf("hello WORLD\n");

return 0;

COPYING A FILE
ENTER NAME OF CURRENT FILE TO BE COPIED FROM :myFile
ENTER NAME OF NEW FILE NAME TO BE COPIED TO :myFile_copy
FILE myFile has been copied to myFile_copy successfully OK .....
RENAMEING A FILE
ENTER CURRENT FILE NAME :myFile
ENTER NEW FILE NAME :myFile_renamed
FILE myFile has been renamed to myFile_renamed OK.....

```



These two screenshots above are to demonstrate how the C program went on working.

1C.

a) Sample shell script. This script asks you your name, and as you press enter it shows you info about your home dir, hard disk free space and others, which are provided in the screenshot below.

```
urmanov@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./sample.sh
Hi, What is your name
SHakhobiddin
Good Morning SHakhobiddin
=====
Your Home directory : /home/urmanov/Desktop/OS_HW_1/OperatingSystemHW1-master
Enviroment variable PATH = /home/urmanov/bin:/home/urmanov/.local/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/usr/local/games:/snap/bin
PRESS Enter KEY

=====
HARD DISK FREE SPACE INFO
total      used      free      shared   buff/cache   available
Mem:    1912508     1123192     315740     247244     473576     374140
Swap:        0          0          0
PRESS Enter KEY

=====
PROCESSES CURRENTLY RUNNING
F S  UID  PID  PPID  C PRI  NI ADDR SZ WCHAN  TTY          TIME CMD
0 T  1001  5890  4951  0 80    0 - 3829 signal pts/4    00:00:00 sample.sh
0 S  1001  5895  4951  0 80    0 - 3829 wait   pts/4    00:00:00 sample.sh
0 R  1001  5897  5895  0 80    0 - 7919 -      pts/4    00:00:00 ps
PRESS Enter KEY

=====
LINUX VERSION
Linux shakhobiddin-Aspire-4333 4.4.0-96-generic #119-Ubuntu SMP Tue Sep 12 14:59:54 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
PRESS Enter KEY

=====
WHO ARE CURRENTLY LOGGED IN
system boot 2017-10-08 10:03
           run-level 5 2017-10-08 10:04
LOGIN      tty1      2017-10-08 10:04          982 id=tty1
urmanov + tty7 2017-10-08 10:07 07:42          1225 (:0)
PRESS Enter KEY

./sample.sh: line 29: read: `=====': not a valid identifier
Login name:asd
Password:n
Your LOGIN NAME IS asd
Your PASSWORD IS dsa
```

SOC 3010-OS HOME A

b) File-Line, word and byte count

This script counts you number of characters, words and lines in the file that you specified.

wc -l \$FNAME - counts #of lines

wc -w \$FNAME - counts #of words

wc -c \$FNAME - counts #of bytes

The screenshot below is showing how the script went on.

```
v@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master
urmanov@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./fcount.sh
=====
Enter a filename to find number of characters, words and lines
sample.sh
#!/bin/bash
echo Hi, What is your name
read NAME
echo Good Morning $NAME
echo =====
echo Your Home directory : $PWD
echo Enviroment variable PATH = $PATH
echo PRESS Enter KEY
read key
echo =====
echo HARD DISK FREE SPACE INFO
free
echo PRESS Enter KEY
read key
echo =====
echo PROCESSES CURRENTLY RUNNING
ps -la
echo PRESS Enter KEY
read key
echo =====
echo LINUX VERSION
uname -a
echo PRESS Enter KEY
read key
echo =====
echo WHO ARE CURRENTLY LOGGED IN
who -a
echo PRESS Enter KEY
read key
echo =====
read -p 'Login name:' LOGIN
read -sp 'Password:' PASS
echo \n
echo Your LOGIN NAME IS $LOGIN
echo Your PASSWORD IS $PASS
No of lines
33 sample.sh
No of words
114 sample.sh
No of bytes
```

SOC3010-C

c) File Sorting

This script asks you enter file name and 10 names which will be stored in this file. And the entered names are sorted in both orders(asc and desc).

Keyword used to sort is: sort, sort -r for reverse order.

The screenshot below is showing how the script went on.

```
v@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master
=====
your FILE ten_names CONTENTS
Jack
Steve
Robinson
Shakhobiddin
Qochqorbek
Gishmatali
Toshmatali
Mirgani
Masturbek
Somonali
PRESS Enter KEY

=====
FILE SORTING IN ALPHABETICAL ORDER
Gishmatali
Jack
Masturbek
Mirgani
Qochqorbek
Robinson
Shakhobiddin
Somonali
Steve
Toshmatali
PRESS Enter KEY

=====
FILE SORTING IN REVERSE ALPHABETICAL ORDER
Toshmatali
Steve
Somonali
Shakhobiddin
Robinson
Qochqorbek
Mirgani
Masturbek
Jack
Gishmatali
PRESS Enter KEY
```

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d) Examples for Conditional construct if ...then....else ...fi.

This script gets from user the value of LONG and using the

syntax: if [\$LONG -eq 1], which means "if LONG is equal to 1" branches into two cases ls-la or ls, which show extended and short directory listing.

The screenshot below is showing how the script went on.

```
urmanov@shakobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./flist.sh
=====
Do you want directory listing long or short ( enter 1 or 0 )
1
total 1200
drwx----- 3 urmanov urmanov 4096 Okt  8 17:58 .
drwxrwxr-x  4 urmanov urmanov 4096 Okt  8 01:50 ..
-rw-rxr-xr-x 1 urmanov urmanov  76 Okt  6 22:09 alices_file
-rw-rw-r-- 1 urmanov urmanov 114 Okt  6 22:09 array.sh
-rw-rw-r-- 1 urmanov urmanov 5836 Okt  8 13:16 Assignment.md
-rw-rw-r-- 1 urmanov urmanov 1302 Okt  6 22:09 case.sh
-rw-rw-r-- 1 urmanov urmanov  269 Okt  6 22:09 cfiles.sh
-rw-rw-r-- 1 urmanov urmanov  105 Okt  6 22:09 copy.sh
-rw-rxr-xr-x 1 urmanov urmanov  45 Okt  6 22:09 crypto_file
-rw-rw-r-- 1 urmanov urmanov  254 Okt  6 22:09 fact.sh
-rw-rxr-xr-x 1 urmanov urmanov  276 Okt  6 22:09 fcount.sh
-rw-rw-r-- 1 urmanov urmanov  55 Okt  6 22:09 file
-rwxrwxr-x  1 urmanov urmanov 13288 Okt  8 10:38 file_oper
-rw-rw-r-- 1 urmanov urmanov 5076 Okt  8 12:55 file_oper.c
-rwxrwxr-x  1 urmanov urmanov  229 Okt  8 17:58 flist.sh
-rw-rxr-xr-x 1 urmanov urmanov  691 Okt  6 22:09 fsort.sh
drwxrwxr-x  8 urmanov urmanov 4096 Okt  8 02:30 .git
-rw-rw-r-- 1 urmanov urmanov  68 Okt  6 22:09 .gitignore
-rw-rw-r-- 1 urmanov urmanov 500484 Okt  6 22:09 HW1.docx
-rw-rw-r-- 1 urmanov urmanov  107 Okt  6 22:09 len.sh
-rw-rw-r-- 1 urmanov urmanov  319 Okt  6 22:09 maxlist.sh
-rw-rw-r-- 1 urmanov urmanov  219 Okt  6 22:09 max.sh
-rw-rxrwxr-- 1 urmanov urmanov  72 Okt  8 10:39 myfile_renamed
<-rw-rw-r-- 1 urmanov urmanov 142 Okt  6 22:09 names
-rw-rw-r-- 1 urmanov urmanov 568786 Okt  6 22:09 OS_HOME_ASSIGNMENT_1.pdf
-rw-rw-r-- 1 urmanov urmanov  187 Okt  6 22:09 proc_invok.sh
-rw-rw-r-- 1 urmanov urmanov 1849 Okt  6 22:09 README.md
-rw-rxr-xr-x 1 urmanov urmanov  889 Okt  6 22:09 sample.sh
-rw-rw-r-- 1 urmanov urmanov  735 Okt  6 22:09 select.sh
-rw-rw-r-- 1 urmanov urmanov  44 Okt  8 01:54 Shakobiddin
```

SOC 3010-OS HOME WORK

e) i) while do done construct

The script shows how while-do-done loop structure works, calculating the sum of the first odd integers. Variable A here serves as an iterator for checking the limit, B and C are used to calculate the sum. And the sum is stored in variable B.

The screenshot below is showing how the script went on.

```
v@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./sumodd.sh
=====
Computing SUM OF FIRST n ODD INTEGERS
ENTER VALUE OF n=
20
Sum of FIRST 20 odd numbers = 400
PRESS Enter KEY

urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./sumodd.sh
=====
Computing SUM OF FIRST n ODD INTEGERS
ENTER VALUE OF n=
5
Sum of FIRST 5 odd numbers = 25
PRESS Enter KEY

urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ █
```

ii) for dodone construct

There are two scripts here, the first script shows how for-do-done loop structure works with the example of finding the files with the extension .c.

And the next script(sum100.sh) computes the sum of first 100 integers using for-do-done structure.

The screenshots below are showing how the scripts went on.

```
urmanov@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./cfiles.sh
Files in your HOME Directory with extension .c
/home/urmanov/task1b.c
/home/urmanov/test.c
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ chmod +x sum100.sh
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./sum100.sh
COMPUTING SUM OF FIRST 100 INTEGERS
SUM OF FIRST 100 INTEGERS = 0+1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16+17+18+19+20+21+22+23+24+25+26+27+28+29+30+31+32+33+34+35+36+37+38+39
+40+41+42+43+44+45+46+47+48+49+50+51+52+53+54+55+56+57+58+59+60+61+62+63+64+65+66+67+68+69+70+71+72+73+74+75+76+77+78+79+80+81+82+83+84+85+86+87+88+89+90+91+92+93+94+95+96+97+98+99+100
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ █
```

SOC301OC

iii) until do..... done construct

The script shows how the until-do-done loop structure works, computing the factorial of the entered value n. The screenshot below is showing how the script went on.

urmanov@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master\$ chmod +x fact.sh
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master\$./fact.sh
=====
Computing FACTORIAL OF n
ENTER VALUE OF n= 6
FACTORIAL OF 6 = 720
PRESS Enter KEY
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master\$./fact.sh
=====
Computing FACTORIAL OF n
ENTER VALUE OF n= 9
FACTORIAL OF 9 = 362880
PRESS Enter KEY

f) Example for Multi-way Branch - caseesac

The script shows how to use Multi-way branching case...esac. The program provides you with 11 choice menu for dealing with files or giving some info(linux version, etc).

Branches are finished with double-semicolons(;;) which means the end of the branch.
And in the last choice most interesting there is *) case which means default case(any other value which is not specified above).

case is finished with esac.

The screenshots below are showing how the script went on.

urmanov@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master\$./case.sh: line 11: ..: filename argument required
.: usage: . filename [arguments]
1. LIST DIRECTORY CONTENTS
./case.sh: line 13: ..: filename argument required
.: usage: . filename [arguments]
2. SHOW CURRENT WORKING DIRECTORY .
3. DISPLAY LINUX VERSION
./case.sh: line 16: ..: filename argument required
.: usage: . filename [arguments]
4. SHOW FREE SPACE ON DISK
./case.sh: line 18: ..: filename argument required
.: usage: . filename [arguments]
5. SHOW WHO ARE LOGGED IN
./case.sh: line 20: ..: filename argument required
.: usage: . filename [arguments]
6. DISPLAY CONTENTS OF A FILE
./case.sh: line 22: ..: filename argument required
.: usage: . filename [arguments]
7. CREATE OR OPEN A FILE
./case.sh: line 24: ..: filename argument required
.: usage: . filename [arguments]
8. COPY A FILE
./case.sh: line 26: ..: filename argument required
.: usage: . filename [arguments]
9. RENAME A FILE
./case.sh: line 28: ..: filename argument required
.: usage: . filename [arguments]
10. REMOVE A FILE
./case.sh: line 30: ..: filename argument required
.: usage: . filename [arguments]
11. QUIT
./case.sh: line 32: ..: filename argument required
.: usage: . filename [arguments]
.....
ENTER YOUR CHOICE :
1
alices_file cfiles.sh fcount.sh flist.sh maxlist.sh OS_HOME_ASSIGNMENT_1.pdf select.sh sumodd.sh
array.sh copy.sh file fsort.sh max.sh proc_invok.sh Shakobiddin ten_names
Assignment.md crypto_file file_oper HW1.docx myFile_renamed README.md some_another_file Ulugbek
case.sh fact.sh file_oper.c len.sh names sample.sh sum100.sh var.sh
.....

```
urmanov@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1
```



```
. ./case.sh: line 8: MENU: command not found
./case.sh: line 9: .. filename argument required
.: usage: . filename [arguments]
.
./case.sh: line 11: .. filename argument required
.: usage: . filename [arguments]
. 1. LIST DIRECTORY CONTENTS
./case.sh: line 13: .. filename argument required
.: usage: . filename [arguments]
. 2. SHOW CURRENT WORKING DIRECTORY .
. 3. DISPLAY LINUX VERSION
./case.sh: line 16: .. filename argument required
.: usage: . filename [arguments]
. 4. SHOW FREE SPACE ON DISK
./case.sh: line 18: .. filename argument required
.: usage: . filename [arguments]
. 5. SHOW WHO ARE LOGGED IN
./case.sh: line 20: .. filename argument required
.: usage: . filename [arguments]
. 6. DISPLAY CONTENTS OF A FILE
./case.sh: line 22: .. filename argument required
.: usage: . filename [arguments]
. 7. CREATE OR OPEN A FILE
./case.sh: line 24: .. filename argument required
.: usage: . filename [arguments]
. 8. COPY A FILE
./case.sh: line 26: .. filename argument required
.: usage: . filename [arguments]
. 9. RENAME A FILE
./case.sh: line 28: .. filename argument required
.: usage: . filename [arguments]
. 10. REMOVE A FILE
./case.sh: line 30: .. filename argument required
.: usage: . filename [arguments]
. 11. QUIT
./case.sh: line 32: .. filename argument required
.: usage: . filename [arguments]
.....  
ENTER YOUR CHOICE :
2
/home/urmanov/Desktop/OS_HW_1/OperatingSystemHW1-master
```

SOC 3010-OS

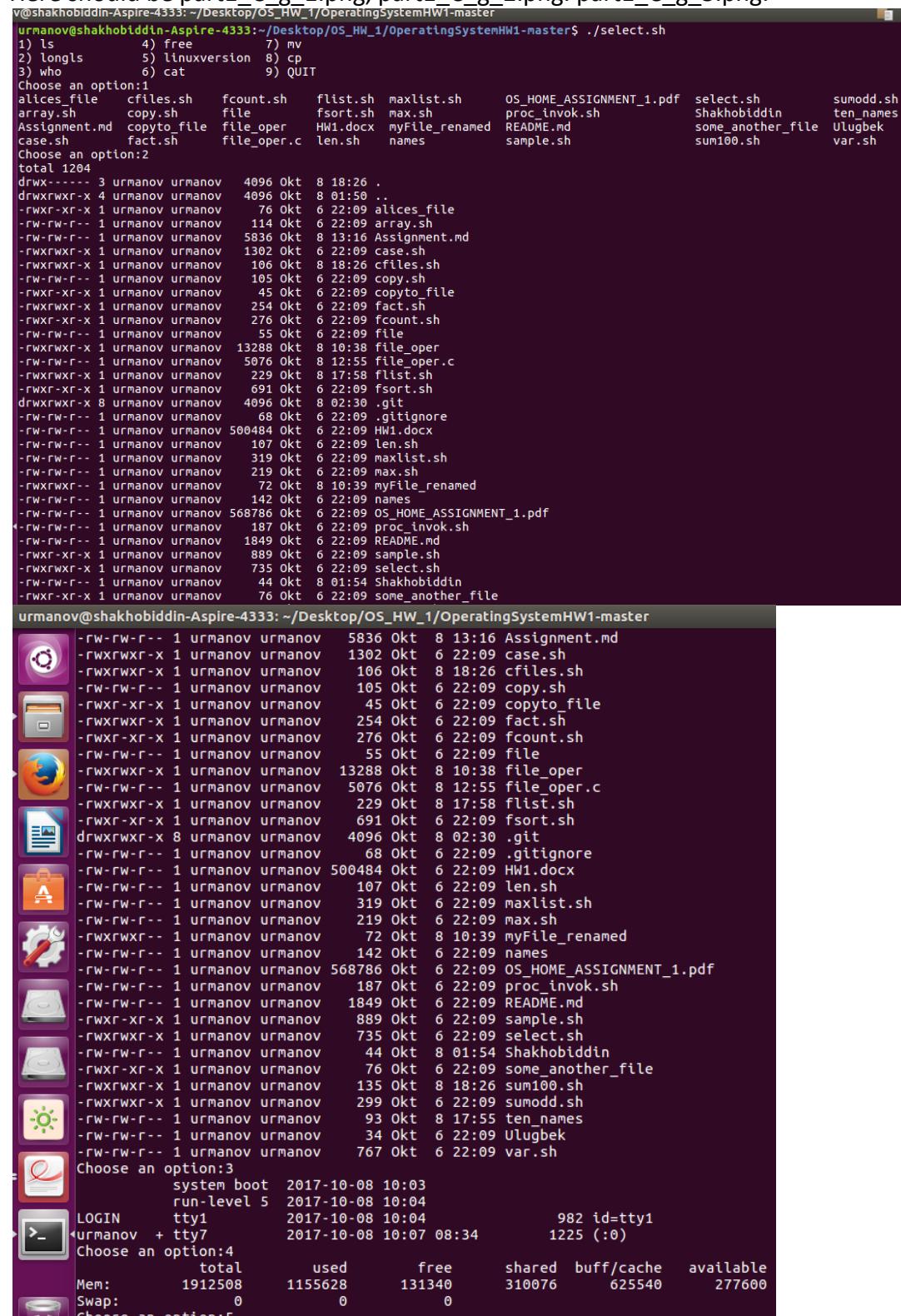
FALL 2017

g) Example for Select dodone and if ...eliffi constructs.

The script shows how to use select-do-done and if-elif structures. In the string variable OPTIONS the options are specified, So that "select choice in \$options" provides you menu. if-elif structure is used to find the selected option and execute proper commands.

The screenshot below is showing how the script went on.

Here should be part1_C_g_1.png, part1_C_g_2.png, part1_C_g_3.png.



urmanov@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master\$./select.sh

```
1) ls          4) free      7) mv
2) longls     5) linuxversion 8) cp
3) who         6) cat       9) QUIT
Choose an option:1
alices_file    cfiles.sh    fcount.sh    flist.sh    maxlist.sh      OS_HOME_ASSIGNMENT_1.pdf    select.sh      sumodd.sh
array.sh       copy.sh      file        fsort.sh    max.sh        proc_invok.sh   ShakhoBiddin  ten_names
Assignment.md  crypto_file file_oper   HW1.docx   myFile_renamed README.md   some_another_file Ulugbek
case.sh        fact.sh     file_oper.c len.sh     names        sample.sh   sum100.sh   var.sh
Choose an option:2
total 1204
drwx----- 3 urmanov urmanov 4096 Okt 8 18:26 .
drwxrwxr-x 4 urmanov urmanov 4096 Okt 8 01:50 ..
-rwvxr-xr-x 1 urmanov urmanov 76 Okt 6 22:09 alices_file
-rw-rw-r-- 1 urmanov urmanov 114 Okt 6 22:09 array.sh
-rw-rw-r-- 1 urmanov urmanov 5836 Okt 8 13:16 Assignment.md
-rwrxrwxr-x 1 urmanov urmanov 1302 Okt 6 22:09 case.sh
-rwrxrwxr-x 1 urmanov urmanov 106 Okt 8 18:26 cfiles.sh
-rw-rw-r-- 1 urmanov urmanov 105 Okt 6 22:09 copy.sh
-rwrxr-xr-x 1 urmanov urmanov 45 Okt 6 22:09 crypto_file
-rwrxrwxr-x 1 urmanov urmanov 254 Okt 6 22:09 fact.sh
-rwrxr-xr-x 1 urmanov urmanov 276 Okt 6 22:09 fcount.sh
-rw-rw-r-- 1 urmanov urmanov 55 Okt 6 22:09 file
-rwrxrwxr-x 1 urmanov urmanov 13288 Okt 8 10:38 file_oper
-rw-rw-r-- 1 urmanov urmanov 5076 Okt 8 12:55 file_oper.c
-rwrxrwxr-x 1 urmanov urmanov 229 Okt 8 17:58 flist.sh
-rwrxr-xr-x 1 urmanov urmanov 691 Okt 6 22:09 fsort.sh
drwxrwxr-x 8 urmanov urmanov 4096 Okt 8 02:30 .git
-rw-rw-r-- 1 urmanov urmanov 68 Okt 6 22:09 .gitignore
-rw-rw-r-- 1 urmanov urmanov 500484 Okt 6 22:09 HW1.docx
-rw-rw-r-- 1 urmanov urmanov 107 Okt 6 22:09 len.sh
-rw-rw-r-- 1 urmanov urmanov 319 Okt 6 22:09 maxlist.sh
-rw-rw-r-- 1 urmanov urmanov 219 Okt 6 22:09 max.sh
-rwrxrwxr-x 1 urmanov urmanov 72 Okt 8 10:39 myFile_renamed
-rw-rw-r-- 1 urmanov urmanov 142 Okt 6 22:09 names
-rw-rw-r-- 1 urmanov urmanov 568786 Okt 6 22:09 OS_HOME_ASSIGNMENT_1.pdf
-rw-rw-r-- 1 urmanov urmanov 187 Okt 6 22:09 proc_invok.sh
-rw-rw-r-- 1 urmanov urmanov 1849 Okt 6 22:09 README.md
-rwrxr-xr-x 1 urmanov urmanov 889 Okt 6 22:09 sample.sh
-rwrxrwxr-x 1 urmanov urmanov 735 Okt 6 22:09 select.sh
-rw-rw-r-- 1 urmanov urmanov 44 Okt 8 01:54 ShakhoBiddin
-rwrxr-xr-x 1 urmanov urmanov 76 Okt 6 22:09 some_another_file
urmanov@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master$
```

-rw-rw-r-- 1 urmanov urmanov 5836 Okt 8 13:16 Assignment.md
-rwxrwxr-x 1 urmanov urmanov 1302 Okt 6 22:09 case.sh
-rwxrwxr-x 1 urmanov urmanov 106 Okt 8 18:26 cfiles.sh
-rw-rw-r-- 1 urmanov urmanov 105 Okt 6 22:09 copy.sh
-rwxr-xr-x 1 urmanov urmanov 45 Okt 6 22:09 crypto_file
-rwxrwxr-x 1 urmanov urmanov 254 Okt 6 22:09 fact.sh
-rwxr-xr-x 1 urmanov urmanov 276 Okt 6 22:09 fcount.sh
-rw-rw-r-- 1 urmanov urmanov 55 Okt 6 22:09 file
-rwxrwxr-x 1 urmanov urmanov 13288 Okt 8 10:38 file_oper
-rw-rw-r-- 1 urmanov urmanov 5076 Okt 8 12:55 file_oper.c
-rwxrwxr-x 1 urmanov urmanov 229 Okt 8 17:58 flist.sh
-rwxr-xr-x 1 urmanov urmanov 691 Okt 6 22:09 fsort.sh
drwxrwxr-x 8 urmanov urmanov 4096 Okt 8 02:30 .git
-rw-rw-r-- 1 urmanov urmanov 68 Okt 6 22:09 .gitignore
-rw-rw-r-- 1 urmanov urmanov 500484 Okt 6 22:09 HW1.docx
-rw-rw-r-- 1 urmanov urmanov 107 Okt 6 22:09 len.sh
-rw-rw-r-- 1 urmanov urmanov 319 Okt 6 22:09 maxlist.sh
-rw-rw-r-- 1 urmanov urmanov 219 Okt 6 22:09 max.sh
-rwxrwxr-x 1 urmanov urmanov 72 Okt 8 10:39 myFile_renamed
-rw-rw-r-- 1 urmanov urmanov 142 Okt 6 22:09 names
-rw-rw-r-- 1 urmanov urmanov 568786 Okt 6 22:09 OS_HOME_ASSIGNMENT_1.pdf
-rw-rw-r-- 1 urmanov urmanov 187 Okt 6 22:09 proc_invok.sh
-rw-rw-r-- 1 urmanov urmanov 1849 Okt 6 22:09 README.md
-rwxr-xr-x 1 urmanov urmanov 889 Okt 6 22:09 sample.sh
-rwxrwxr-x 1 urmanov urmanov 735 Okt 6 22:09 select.sh
-rw-rw-r-- 1 urmanov urmanov 44 Okt 8 01:54 ShakhoBiddin
-rwxr-xr-x 1 urmanov urmanov 76 Okt 6 22:09 some_another_file
-rwxrwxr-x 1 urmanov urmanov 135 Okt 8 18:26 sum100.sh
-rwxrwxr-x 1 urmanov urmanov 299 Okt 6 22:09 sumodd.sh
-rw-rw-r-- 1 urmanov urmanov 93 Okt 8 17:55 ten_names
-rw-rw-r-- 1 urmanov urmanov 34 Okt 6 22:09 Ulugbek
-rw-rw-r-- 1 urmanov urmanov 767 Okt 6 22:09 var.sh

Choose an option:3
system boot 2017-10-08 10:03
run-level 5 2017-10-08 10:04
982 id=tty1
urmanov + tty7 2017-10-08 10:07 08:34 1225 (:0)

Choose an option:4
total used free shared buff/cache available
Mem: 1912508 1155628 131340 310076 625540 277600
Swap: 0 0 0

Choose an option:5

```
v@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./select.sh
1) ls          4) free        7) mv
2) longls      5) linuxversion 8) cp
3) who         6) cat         9) QUIT
Choose an option:7
ENTER OLD FILE NAME :
myFile_renamed
ENTER NEW FILE NAME :
my_File_renamed.c
Choose an option:8
ENTER NAME OF FILE TO BE COPIED FROM:
my_Flie_renamed.c
ENTER NAME OF FILE TO BE COPIED TO :
abcdefghijklm
cp: cannot stat 'my_Flie_renamed.c': No such file or directory
Choose an option:9
BYE ... BYE
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$
```

h) Passing parameters using Command Line Arguments

The script demonstrates the use of command line arguments. \$1 is for getting the first command line argument, and \$2 is for second. The program gets \$1 and \$2 as the names of the files, where the content of the file1 should be copied to file2.

The screenshot below is showing how the script went on.

```
v@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ chmod +x copy.sh
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./copy.sh copy_sample1 copy_sample2
Copying file copy_sample1 to copy_sample2
file copy_sample1 CONTENTS
Hello it is copy_sample1, which must be copied to copy_sample2
file copy_sample2 CONTENTS
Hello it is copy_sample1, which must be copied to copy_sample2
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$
```

i) Length of a string

The script reads the string and gives the length of the string as output. \${#STR} is used to show the length of the string.

The screenshot below is showing how the script went on.

```
v@shakhobiddin-Aspire-4333: ~/Desktop/OS_HW_1/OperatingSystemHW1-master
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ chmod +x len.sh
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./len.sh
Enter a string :
Shakhobiddin Urmanov is me
LENGTH OF THE string : 26
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./len.sh
Enter a string :
Google is the place where I work
LENGTH OF THE string : 33
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$
```

j) Use of Special Variables

The script shows the use of special variables.

\$0 - contains the name of the running script
 \$# - contains # of command line arguments
 \$@ - contains All the arguments supplied to the bash script
 \$? - contains The exit status of the most recently run process
 \$\$ - contains The process ID of the current script
 \$USER - contains User Name of the user running the script
 \$HOSTNAME- contains The hostname of the machine the script is running on
 \$SECONDS- contains The number of seconds since the script was started
 \$LINENO - contains Current line number in the Bash script
 \$RANDOM - contains Random number returned by the RANDOM variable
 The screenshot below is showing how the script went on.

```

urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./var.sh
=====
Name of the Bash script - ./var.sh
How many arguments were passed to the Bash script - 0
All the arguments supplied to the bash script -
The exit status of the most recently run process 0
The process ID of the current script - 7602
User Name of the user running the script - urmanov
The hostname of the machine the script is running on - shakhobiddin-Aspire-4333
The number of seconds since the script was started - 0
Current line number in the Bash script : 11
Random number returned by the RANDOM variable - 12128
VALUES OF ALL ENVIRONMENT VARIABLES SET UP IN THE CURRENT
./var.sh: line 14: ENVIRONMENT: command not found
LC_PAPER=uz_UZ.UTF-8
XDG_VTNR=7
XDG_SESSION_ID=c2
LC_ADDRESS=uz_UZ.UTF-8
CLUTTER_IM_MODULE=xim
LC_MONETARY=uz_UZ.UTF-8
XDG_GREETER_DATA_DIR=/var/lib/lightdm-data/urmanov
GPG_AGENT_INFO=/home/urmanov/.gnupg/S.gpg-agent:0:1
SHELL=/bin/bash
VTE_VERSION=4205
TERM=xterm-256color
QT_LINUX_ACCESSIBILITY_ALWAYS_ON=1
LC_NUMERIC=uz_UZ.UTF-8
WINDOWID=73406330
GNOME_KEYRING_CONTROL=
UPSTART_SESSION=unix:abstract=/com/ubuntu/upstart-session/1001/1225
GTK_MODULES=gail:atk:bridge:unity-gtk-module
USER=urmanov
QT_ACCESSIBILITY=1
LC_TELEPHONE=uz_UZ.UTF-8
LS_COLORS=rs=0:di=0;34:ln=0;36:mh=00:pi=40;33:so=01;35:do=01;35:bd=40;33:01:cd=40;33:01:or=40;31:01:mi=00:su=37;41:sg=30;43:ca=30;41:tw=30;42
:ow=34;42:st=37;44:ex=01;32:*.tar=01;31:*.tgz=01;31:*.arc=01;31:*.arj=01;31:*.taz=01;31:*.lha=01;31:*.lz4=01;31:*.lz=01;31:*.tlz=01;31:*.xz=01;31:*.txz=01;31:*.tar.zst=01;31:*.tar.gz=01;31:*.bz=01;31:*.tbz=01;31:*.tbz2=01;31:*.deb=01;31:*.rpm=01;31:*.jar=01;31:*.war=01;31:*.ear=01;31:*.sar=01;31:*.rar=01;31:*.alz=01;31:*.ace=01;31:*.zoo=01;31:*.cpio=01;31:*.7z=01;31:*.rz=01;31:*.cab=01;31:*.jpg=01;35:*.jpeg=01;35:*.gif=01;35:*.bmp=01;35:*.pbm=01;35:*.pgm=01;35:*.ppm=01;35:*.tga=01;35:*.xbm=01;35:*.xpm=01;35:*.tif=01;35:*.tiff=01;35:*.png=01;35:*.svg=01;35:*.svgz=01;35:*.mng=01;35:*.pcx=01;35:*.mov=01;35:*.mpm=01;35:*.mpeg=01;35:*.m2v=01;35:*.mkv=01;35:*.webm=01;35:*.ogm=01;35:*.mp4=01;35:*.m4v=01;35:*.vob=01;35:*.qt=01;35:*.nuv=01;35:*.wmv=01;35:*.asf=01;35:*.rmvb=01;35:*.flc=01;35:*.avi=01;35:*.fli=01;35:*.flv=01;35:*.gl=01;35:*.dl=01;35:*.xcf=01;35:*.xwd=01;35:*.yuv=01;35:*.cgm=01;35:*.emf=01;35:*.ogv=01;35:*.ogg=01;35:*.aac=00;36:*.au=00;36:*.flac=00;36:*.m4a=00;36:*.mid=00;36:*.midi

```

k) Using Arrays

i) In this script we can see the declaration format of the array - name=(1 2 3 4). And each element of the array is referenced like this - \${list[\$I]}.

and the array is printed out using the while loop.

ii) This is the next example of using arrays. Here the maximum element is found in the given array.

iii) In this script array of the size of n is created and n values are taken from input. And in this array the maximum element is found and echoed into screen.

```
v@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ chmod +x array.sh
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./array.sh
12
67
123
49
88
123
-9
0
456
126
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ chmod +x max.sh
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./max.sh
Maximum element in the list is : 456
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ chmod +x maxlist.sh
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./maxlist.sh
Enter size of the list :
5
Enter a list of 5 numbers :
1
5
3
7
2
Maximum element in the list is : 7
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ █
```

l) Procedure Invocation

The script shows how the procedures are invoked and how variables are passed into them. \$? this expands the exit status of the most recently executed command

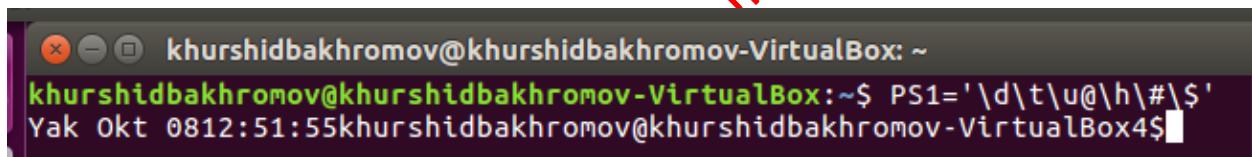
```
v@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ chmod +x array.sh
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./array.sh
12
67
123
49
88
123
-9
0
456
126
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ chmod +x max.sh
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./max.sh
Maximum element in the list is : 456
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ chmod +x maxlist.sh
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./maxlist.sh
Enter size of the list :
5
Enter a list of 5 numbers :
1
5
3
7
2
Maximum element in the list is : 7
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ chmod +x proc_invok.sh
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ ./proc_invok.sh
Enter a string :
This is the last shell script
Length of the string This is 29
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$ █
```

Part 2: Activities

2A

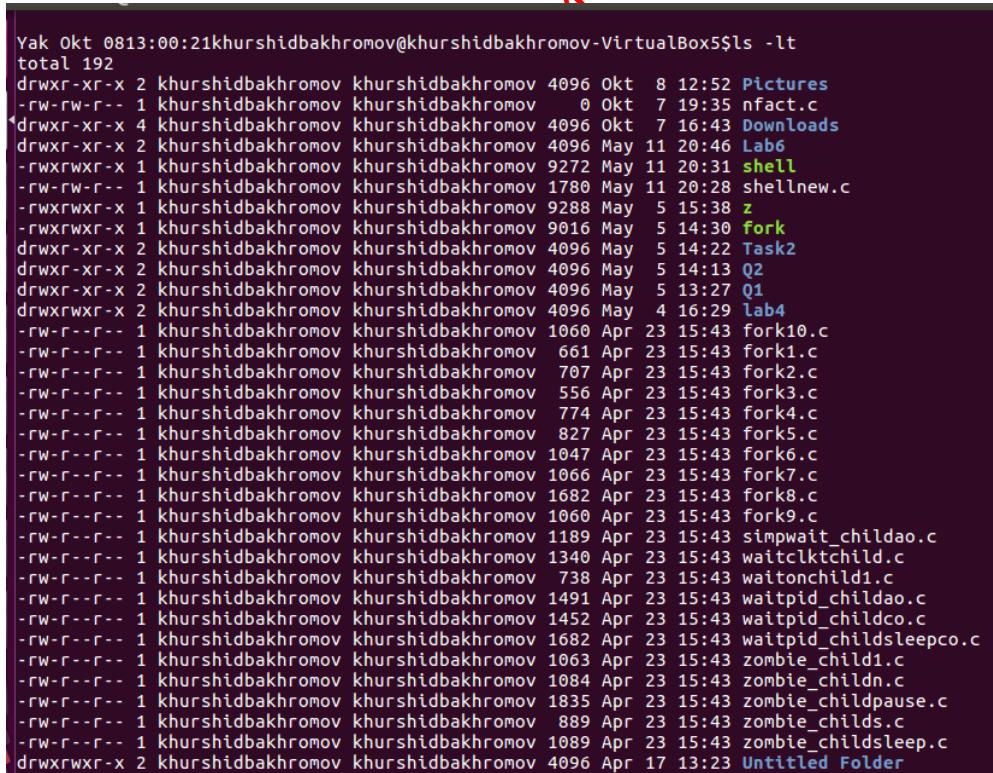
- PS1 (Prompt String 1) is one of the prompts available in Linux/Unix. When you try to login to any machine, you have to enter user name and password. Once you are done with this you are presented with some info like who logged in, on what machine he logged in, what is his present working directory and if the logged in user is a super user or a normal user. This is done by using PS1 prompt which is a [inbuilt shell variable](#).

d- the date in “Weekday Month Date” format
t- current time in 24 hour HH:MM:SS format
u – username of current user
- the command number of this command
@ - the current time in 12 hour am/pm
\$ if the effective UID is 0, a #, otherwise a \$
\ - a backslash
h – host name up to the first



```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ PS1='\\d\\t\\u@\\h\\#\\$'  
Yak Okt 0812:51:55khurshidbakhromov@khurshidbakhromov-VirtualBox4$
```

- This command shows all files and folders with their date of creation in decreasing order



```
Yak Okt 0813:00:21khurshidbakhromov@khurshidbakhromov-VirtualBox5$ls -lt  
total 192  
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 Okt  8 12:52 Pictures  
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov    0 Okt  7 19:35 nfact.c  
*drwxr-xr-x 4 khurshidbakhromov khurshidbakhromov 4096 Okt  7 16:43 Downloads  
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 May 11 20:46 Lab6  
-rwxrwxr-x 1 khurshidbakhromov khurshidbakhromov 9272 May 11 20:31 shell  
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 1780 May 11 20:28 shellnew.c  
-rwxrwxr-x 1 khurshidbakhromov khurshidbakhromov 9288 May  5 15:38 z  
-rwxrwxr-x 1 khurshidbakhromov khurshidbakhromov 9016 May  5 14:30 fork  
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 May  5 14:22 Task2  
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 May  5 14:13 Q2  
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 May  5 13:27 Q1  
drwxrwxr-x 2 khurshidbakhromov khurshidbakhromov 4096 May  4 16:29 lab4  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1060 Apr 23 15:43 fork10.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 661 Apr 23 15:43 fork1.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 707 Apr 23 15:43 fork2.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 556 Apr 23 15:43 fork3.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 774 Apr 23 15:43 fork4.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 827 Apr 23 15:43 fork5.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1047 Apr 23 15:43 fork6.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1066 Apr 23 15:43 fork7.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1682 Apr 23 15:43 fork8.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1060 Apr 23 15:43 fork9.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1189 Apr 23 15:43 simpwait_childao.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1340 Apr 23 15:43 waitclkchild.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 738 Apr 23 15:43 waitonchild1.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1491 Apr 23 15:43 waitpid_childao.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1452 Apr 23 15:43 waitpid_childco.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1682 Apr 23 15:43 waitpid_childsleepco.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1063 Apr 23 15:43 zombie_child1.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1084 Apr 23 15:43 zombie_childn.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1835 Apr 23 15:43 zombie_childpause.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 889 Apr 23 15:43 zombie_childs.c  
-rw-r---- 1 khurshidbakhromov khurshidbakhromov 1089 Apr 23 15:43 zombie_childsleep.c  
drwxrwxr-x 2 khurshidbakhromov khurshidbakhromov 4096 Apr 17 13:23 Untitled Folder
```

This command shows all files and folders with their date of creating in increasing order

```
Yak Okt 0813:08:02khurshidbakhromov@khurshidbakhromov-VirtualBox7$ls -lrt
total 192
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 8980 Fev 13 2017 examples.desktop
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 Fev 13 2017 Videos
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 Fev 13 2017 Templates
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 Fev 13 2017 Public
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 Fev 13 2017 Music
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 Mar  3 2017 Documents
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 Mar 21 2017 Desktop
drwxrwxr-x 2 khurshidbakhromov khurshidbakhromov 4096 Apr 17 13:23 Untitled Folder
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1089 Apr 23 15:43 zombie_childsleep.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 889 Apr 23 15:43 zombie_childs.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1835 Apr 23 15:43 zombie_childpause.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1084 Apr 23 15:43 zombie_chldn.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1063 Apr 23 15:43 zombie_child1.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1682 Apr 23 15:43 waitpid_childsleepco.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1452 Apr 23 15:43 waitpid_childco.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1491 Apr 23 15:43 waitpid_chldao.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 738 Apr 23 15:43 waitonchld1.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1340 Apr 23 15:43 waitclkchild.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1189 Apr 23 15:43 simpwait_chldao.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1060 Apr 23 15:43 fork9.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1682 Apr 23 15:43 fork8.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1066 Apr 23 15:43 fork7.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1047 Apr 23 15:43 fork6.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 827 Apr 23 15:43 fork5.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 774 Apr 23 15:43 fork4.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 556 Apr 23 15:43 fork3.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 707 Apr 23 15:43 fork2.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 661 Apr 23 15:43 fork1.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1060 Apr 23 15:43 fork10.c
drwxrwxr-x 2 khurshidbakhromov khurshidbakhromov 4096 May  4 16:29 lab4
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 May  5 13:27 Q1
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 May  5 14:13 Q2
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 May  5 14:22 Task2
-rwxrwxr-x 1 khurshidbakhromov khurshidbakhromov 9016 May  5 14:30 fork
```

3. List information about the FILES (the current directory by default).

Shows list of commands with ls

```
Yak Okt 0813:14:24khurshidbakhromov@khurshidbakhromov-VirtualBox9$ls --help
Usage: ls [OPTION]... [FILE]...
List information about the FILEs (the current directory by default).
Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.

Mandatory arguments to long options are mandatory for short options too.
  -a, --all                  do not ignore entries starting with .
  -A, --almost-all           do not list implied . and ..
  --author                 with -l, print the author of each file
  -b, --escape               print C-style escapes for nongraphic characters
  --block-size=SIZE          scale sizes by SIZE before printing them; e.g.,
                            '--block-size=M' prints sizes in units of
                            1,048,576 bytes; see SIZE format below
  -B, --ignore-backups      do not list implied entries ending with ~
  -c                         with -lt: sort by, and show, ctime (time of last
                            modification of file status information);
                            with -l: show ctime and sort by name;
                            otherwise: sort by ctime, newest first
  -C                         list entries by columns
  --color[=WHEN]             colorize the output; WHEN can be 'always' (default
                            if omitted), 'auto', or 'never'; more info below
  -d, --directory            list directories themselves, not their contents
  -D, --diredded             generate output designed for Emacs' diredd mode
  -f                         do not sort, enable -aU, disable -ls --color
  -F, --classify              append indicator (one of */=>@!) to entries
  --file-type                likewise, except do not append '*'
  --format=WORD               across -x, commas -m, horizontal -x, long -l,
                            single-column -1, verbose -l, vertical -c
  --full-time                like -l --time-style=full-iso
  -g                         like -l, but do not list owner
  --group-directories-first  group directories before files;
                            can be augmented with a --sort option, but any
                            use of --sort=none (-U) disables grouping
  -G, --no-group              in a long listing, don't print group names
  -h, --human-readable        with -l and/or -s, print human readable sizes
```

4. This command increase ID of user. See picture.....

```
Yak Okt 0813:22:30khurshidbakhromov@khurshidbakhromov-VirtualBox11$cd  
~  
Yak Okt 0813:22:46khurshidbakhromov@khurshidbakhromov-VirtualBox12$cd  
~  
Yak Okt 0813:22:56khurshidbakhromov@khurshidbakhromov-VirtualBox13$cd  
~  
Yak Okt 0813:23:03khurshidbakhromov@khurshidbakhromov-VirtualBox14$
```

5. This command helps us connect files. In this case connect to computer's information.

```
Yak Okt 0813:33:41khurshidbakhromov@khurshidbakhromov-VirtualBox18$cat  
.profile  
# ~/.profile: executed by the command interpreter for login shells.  
# This file is not read by bash(1), if ~/.bash_profile or ~/.bash_login  
# exists.  
# see /usr/share/doc/bash/examples/startup-files for examples.  
# the files are located in the bash-doc package.  
  
# the default umask is set in /etc/profile; for setting the umask  
# for ssh logins, install and configure the libpam-umask package.  
#umask 022  
  
# if running bash  
if [ -n "$BASH_VERSION" ]; then  
    # include .bashrc if it exists  
    if [ -f "$HOME/.bashrc" ]; then  
        . "$HOME/.bashrc"  
    fi  
fi  
  
# set PATH so it includes user's private bin directories  
PATH="$HOME/bin:$HOME/.local/bin:$PATH"  
Yak Okt 0813:33:49khurshidbakhromov@khurshidbakhromov-VirtualBox19$
```

6. Print system information. uname -r print kernel release

```
Yak Okt 0814:48:16khurshidbakhromov@khurshidbakhromov-VirtualBox: ~  
me -r  
4.4.0-75-generic  
Yak Okt 0814:48:23khurshidbakhromov@khurshidbakhromov-VirtualBox25$
```

7. Print system information. uname -a print all information, in the following order, except omit -p and -l if unknown

```
Yak Okt 0814:58:12khurshidbakhromov@khurshidbakhromov-VirtualBox28$una  
me -a  
Linux khurshidbakhromov-VirtualBox 4.4.0-75-generic #96-Ubuntu SMP Thu  
Apr 20 09:56:33 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux  
Yak Okt 0815:01:11khurshidbakhromov@khurshidbakhromov-VirtualBox29$
```

8. Print system information. uname -n print the network node hostname

```
khurshidbakhromov@khurshidbakhromov-VirtualBox: ~
Yak Okt 0815:01:43khurshidbakhromov@khurshidbakhromov-VirtualBox30$uname
me -n
khurshidbakhromov-VirtualBox
Yak Okt 0815:01:55khurshidbakhromov@khurshidbakhromov-VirtualBox31$
```

9. Print system information. uname -o print the operating system

```
khurshidbakhromov@khurshidbakhromov-VirtualBox: ~
Yak Okt 0815:02:30khurshidbakhromov@khurshidbakhromov-VirtualBox32$uname
-o
GNU/Linux
Yak Okt 0815:03:11khurshidbakhromov@khurshidbakhromov-VirtualBox33$
```

10. Print system information. uname -p print the processor type

```
khurshidbakhromov@khurshidbakhromov-VirtualBox: ~
Yak Okt 0815:03:28khurshidbakhromov@khurshidbakhromov-VirtualBox34$uname
-p
x86_64
Yak Okt 0815:03:32khurshidbakhromov@khurshidbakhromov-VirtualBox35$
```

11. This command prints processor type

```
khurshidbakhromov@khurshidbakhromov-VirtualBox: ~
Yak Okt 0815:07:28khurshidbakhromov@khurshidbakhromov-VirtualBox41$arc
h
x86_64
Yak Okt 0815:08:16khurshidbakhromov@khurshidbakhromov-VirtualBox42$
```

12. Change file timestamps

```
khurshidbakhromov@khurshidbakhromov-VirtualBox: ~
Yak Okt 0815:08:38khurshidbakhromov@khurshidbakhromov-VirtualBox43$touch
shellnew.c
Yak Okt 0815:09:17khurshidbakhromov@khurshidbakhromov-VirtualBox44$man
touch
Yak Okt 0815:11:06khurshidbakhromov@khurshidbakhromov-VirtualBox45$
```

13. List directory contents use a long listing format

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ PS1='\\d\\t\\u@\\h\\#\\$'\\nOkt 0923:54:27khurshidbakhromov@khurshidbakhromov-VirtualBox2$ls -l\\nshellnew.c\\n-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 1780 Okt 8 15:09 shellnew.c\\nOkt 0923:59:19khurshidbakhromov@khurshidbakhromov-VirtualBox3$
```

14. This command changes the file mode bits of each given file according to mode, which can be either a symbolic representation of changes to make, or an octal number representing the bit pattern for the new mode bits.

```
Se Okt 1000:01:08khurshidbakhromov@khurshidbakhromov-VirtualBox5$chmod +x shellnew.c\\nSe Okt 1000:01:33khurshidbakhromov@khurshidbakhromov-VirtualBox6$man chmod +x\\nNo manual entry for +x
```

15. List directory contents use a long listing format

```
Se Okt 1000:16:42khurshidbakhromov@khurshidbakhromov-VirtualBox8$ls -l\\nshellnew.c\\n-rwxrwxr-x 1 khurshidbakhromov khurshidbakhromov 1780 Okt 8 15:09 shellnew.c\\nSe Okt 1000:17:30khurshidbakhromov@khurshidbakhromov-VirtualBox9$
```

16. This command concatenate files and print on the standard output.

```
Se Okt 1000:18:58khurshidbakhromov@khurshidbakhromov-VirtualBox10$cat shellnew.c\\n#include <stdio.h>\\n#include <stdlib.h>\\n#include <string.h>\\n#include <malloc.h>\\n#include <unistd.h>\\n#include <sys/types.h>\\n#include <sys/wait.h>\\n#define BUFFER_LEN 1024\\n\\nint main(){\\n    char line[BUFFER_LEN]; //get command line\\n    char* argv[100]; //user command\\n    //set path at bin\\n    char progpath[20]; //full file path\\n    int argc; //arg count\\n\\n    while(1){\\n        printf("My shell> "); //print shell prompt\\n        size_t length = strlen(line);\\n        if(line[length-1]=='\\n')\\n            line[length-1]='\\0';\\n        if(!fgets(line, BUFFER_LEN, stdin)){ //get command and put it\\n            in line\\n            break; //if user hits CTRL+D br\\n        }\\n        if(strcmp(line, "exit")==0){ //check if command is exit\\n            break;\\n        }\\n    }\\n}
```

GNU History Library. Many programs read input from the user a line at a time. The GNU History library is able to keep track of those lines, associate arbitrary data with each line, and utilize information from previous lines in composing new ones.

```
1666 man la
1667 man root
1668 mancat
1669 man cat
1670 history
1671 PS1="\d\t\u@\h#\$"
1672 ls -lt
1673 ls -lrt
1674 ls --help
1675 cd ~
1676 cat .profile
1677 uname -r
1678 uname -a
1679 uname -n
1680 uname -o
1681 uname -p
1682 arch
1683 touch nfact.c
1684 PS1=' \d\t\u@\h#\$'
1685 ls -l shellnew.c
1686 man ls -l
1687 clear
1688 chmod +x shellnew.c
1689 man chmod +x
1690 clear
1691 ls -l shellnew.c
1692 clear
1693 cat shellnew.c
1694 clear
1695 man cat
1696 clear
1697 histoey
1698 clear
1699 history
```

17. Takes last 25 written inputs by user

```
Se Okt 1000:25:27khurshidbakhromov@khurshidbakhromov-VirtualBox20$  
ory 25  
1679 uname -n  
1680 uname -o  
1681 uname -p  
1682 arch  
1683 touch nfact.c  
1684 PS1='\d\t\u@\h#\'$'  
1685 ls -l shellnew.c  
1686 man ls -l  
1687 clear  
1688 chmod +x shellnew.c  
1689 man chmod +x  
1690 clear  
1691 ls -l shellnew.c  
1692 clear  
1693 cat shellnew.c  
1694 clear  
1695 man cat  
1696 clear  
1697 histoey  
1698 clear  
1699 history  
1700 clear  
1701 man history  
1702 clear  
1703 history 25  
Se Okt 1000:25:35khurshidbakhromov@khurshidbakhromov-VirtualBox21$
```

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18. This command report file system disk space usage. Show information about the file system on which each FILE resides, or all file systems by default/

```
Se Okt 1000:39:29khurshidbakhromov@khurshidbakhromov-VirtualBox22$df  
Filesystem 1K-blocks Used Available Use% Mounted on  
udev 2003816 0 2003816 0% /dev  
tmpfs 404664 6148 398516 2% /run  
/dev/sda5 56078684 5810756 47396224 11% /  
tmpfs 2023316 1072 2022244 1% /dev/shm  
tmpfs 5120 4 5116 1% /run/lock  
tmpfs 2023316 0 2023316 0% /sys/fs/cgroup  
tmpfs 404664 72 404592 1% /run/user/1000  
Se Okt 1000:39:34khurshidbakhromov@khurshidbakhromov-VirtualBox23$
```

This command report file system disk space usage. Show information about the file system on which each FILE resides, or all file systems by default. Print sizes in powers of 1024

```
Se Okt 1000:57:09khurshidbakhromov@khurshidbakhromov-VirtualBox31$df -h  
Filesystem Size Used Avail Use% Mounted on  
udev 2.0G 0 2.0G 0% /dev  
tmpfs 396M 6.1M 390M 2% /run  
/dev/sda5 54G 5.6G 46G 11% /  
tmpfs 2.0G 1.2M 2.0G 1% /dev/shm  
tmpfs 5.0M 4.0K 5.0M 1% /run/lock  
tmpfs 2.0G 0 2.0G 0% /sys/fs/cgroup  
tmpfs 396M 64K 396M 1% /run/user/1000  
Se Okt 1000:57:12khurshidbakhromov@khurshidbakhromov-VirtualBox32$
```

19. This command display Linux processes

```
top - 11:18:43 up 5 min, 1 user, load average: 0.18, 0.31, 0.18
Tasks: 163 total, 1 running, 162 sleeping, 0 stopped, 0 zombie
%Cpu(s): 43.4 us, 6.1 sy, 0.0 ni, 49.2 id, 1.4 wa, 0.0 hi, 0.0 si
KiB Mem : 4046596 total, 2993484 free, 584996 used, 468116 buff/
KiB Swap: 9999356 total, 9999356 free, 0 used. 3213204 avail
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+
1379	khurshi+	20	0	1202096	158124	73016	S	35.7	3.9	0:30.39
793	root	20	0	308412	81416	31184	S	10.7	2.0	0:08.34
1906	khurshi+	20	0	621148	30552	25700	S	1.0	0.8	0:00.14
1334	khurshi+	20	0	520036	27560	21812	S	0.7	0.7	0:00.30
1852	khurshi+	20	0	917928	63980	34404	S	0.7	1.6	0:01.23
211	root	20	0	0	0	0	S	0.3	0.0	0:00.05
1213	khurshi+	20	0	43780	4128	2800	S	0.3	0.1	0:00.35
1270	khurshi+	20	0	433464	8528	7268	S	0.3	0.2	0:00.16
1367	khurshi+	20	0	561656	32748	25536	S	0.3	0.8	0:00.46
1430	khurshi+	20	0	178792	4916	4212	S	0.3	0.1	0:00.02
1	root	20	0	119564	5856	4116	S	0.0	0.1	0:01.27
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00
3	root	20	0	0	0	0	S	0.0	0.0	0:00.03
5	root	0	-20	0	0	0	S	0.0	0.0	0:00.00
6	root	20	0	0	0	0	S	0.0	0.0	0:00.05
7	root	20	0	0	0	0	S	0.0	0.0	0:00.09
8	root	20	0	0	0	0	S	0.0	0.0	0:00.00
9	root	rt	0	0	0	0	S	0.0	0.0	0:00.00
10	root	rt	0	0	0	0	S	0.0	0.0	0:00.00
11	root	20	0	0	0	0	S	0.0	0.0	0:00.00
12	root	0	-20	0	0	0	S	0.0	0.0	0:00.00
13	root	0	-20	0	0	0	S	0.0	0.0	0:00.00
14	root	20	0	0	0	0	S	0.0	0.0	0:00.00
15	root	0	-20	0	0	0	S	0.0	0.0	0:00.00
16	root	25	5	0	0	0	S	0.0	0.0	0:00.00
17	root	39	19	0	0	0	S	0.0	0.0	0:00.03
18	root	0	-20	0	0	0	S	0.0	0.0	0:00.00
19	root	0	-20	0	0	0	S	0.0	0.0	0:00.00

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20. This command report a snapshot of the current processes.

```
Se Okt 1011:23:05khurshidbakhromov@khurshidbakhromov-VirtualBox7$ps -l
a
F S      UID      PID  PPIID C PRI  NI ADDR SZ WCHAN TTY          TIME CMD
0 R    1000  2009  1788  0  80  0 -  7605 -  pts/4    00:00:00 ps
Se Okt 1011:23:11khurshidbakhromov@khurshidbakhromov-VirtualBox8$
```

21. This command report a snapshot of all processes

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```

khurshi+ 1516 1363 0 11:14 ? 00:00:00 nm-applet
khurshi+ 1524 1363 0 11:14 ? 00:00:00 /usr/lib/unity-setting
khurshi+ 1533 1126 0 11:14 ? 00:00:00 /usr/lib/gvfs/gvfs-udi
khurshi+ 1538 1126 0 11:14 ? 00:00:00 /usr/lib/evolution/evo
root 1539 1 0 11:14 ? 00:00:00 /usr/lib/udisks2/udisk
khurshi+ 1554 1126 0 11:14 ? 00:00:00 /usr/lib/gvfs/gvfs-mtp
khurshi+ 1559 1126 0 11:14 ? 00:00:00 /usr/lib/gvfs/gvfs-goa
khurshi+ 1564 1126 0 11:14 ? 00:00:00 /usr/lib/gvfs/gvfs-afc
khurshi+ 1570 1126 0 11:14 ? 00:00:00 /usr/lib/gvfs/gvfs-gph
root 1582 1 0 11:14 ? 00:00:00 /usr/lib/x86_64-linux-
khurshi+ 1586 1126 0 11:14 ? 00:00:00 /usr/lib/gvfs/gvfd-tr
khurshi+ 1595 1126 0 11:14 ? 00:00:00 /usr/lib/gvfs/gvfd-me
khurshi+ 1614 1538 0 11:14 ? 00:00:00 /usr/lib/evolution/evo
khurshi+ 1623 1538 0 11:14 ? 00:00:00 /usr/lib/evolution/evo
khurshi+ 1626 1126 0 11:14 ? 00:00:00 /usr/lib/evolution/evo
khurshi+ 1637 1626 0 11:14 ? 00:00:00 /usr/lib/evolution/evo
khurshi+ 1675 1363 0 11:14 ? 00:00:00 zeitgeist-databus
khurshi+ 1682 1126 0 11:14 ? 00:00:00 /bin/sh -c /usr/lib/x8
khurshi+ 1686 1682 0 11:14 ? 00:00:00 /usr/bin/zeitgeist-dae
khurshi+ 1694 1126 0 11:14 ? 00:00:00 /usr/lib/x86_64-linux-
khurshi+ 1738 1363 0 11:15 ? 00:00:00 update-notifier
khurshi+ 1781 1126 0 11:15 ? 00:00:01 /usr/lib/gnome-terminal
khurshi+ 1788 1781 0 11:15 pts/4 00:00:00 bash
khurshi+ 1811 1126 0 11:15 ? 00:00:00 /usr/lib/gvfs/gvfd-ne
khurshi+ 1832 1126 0 11:16 ? 00:00:00 /usr/lib/gvfs/gvfd-dn
khurshi+ 1841 1363 0 11:16 ? 00:00:00 /usr/lib/x86_64-linux-
khurshi+ 1852 1126 0 11:16 ? 00:00:02 evince /home/khurshidb
khurshi+ 1859 1126 0 11:16 ? 00:00:00 /usr/lib/evince/evince
khurshi+ 1950 1126 0 11:19 ? 00:00:00 /usr/lib/x86_64-linux-
khurshi+ 1962 1126 0 11:19 ? 00:00:00 /usr/bin/unity-scope-l
khurshi+ 1963 1126 0 11:19 ? 00:00:00 /usr/lib/x86_64-linux-
root 1989 2 0 11:19 ? 00:00:00 [kworker/u2:2]
root 2047 2 0 11:23 ? 00:00:00 [kworker/0:0]
khurshi+ 2058 1788 0 11:27 pts/4 00:00:00 ps -ef
Se Okt 1011:27:20khurshidbakhromov@khurshidbakhromov-VirtualBox12$
```

22. This command report a snapshot of all processes ordered by time

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```

khurshidbakhromov@khurshidbakhromov-VirtualBox: ~
1538 1213 1213 ? 00:00:00 evolution-calen
1614 1213 1213 ? 00:00:00 evolution-calen
1623 1213 1213 ? 00:00:00 evolution-calen
1554 1213 1213 ? 00:00:00 gvfs-mtp-volume
1559 1213 1213 ? 00:00:00 gvfs-goa-volume
1564 1213 1213 ? 00:00:00 gvfs-afc-volume
1570 1213 1213 ? 00:00:00 gvfs-gphoto2-vo
1586 1213 1213 ? 00:00:00 gvfd-trash
1595 1213 1213 ? 00:00:00 gvfd-metadata
1626 1213 1213 ? 00:00:00 evolution-addre
1637 1213 1213 ? 00:00:00 evolution-addre
1682 1213 1213 ? 00:00:00 sh
1686 1213 1213 ? 00:00:00 zeitgeist-daemo
1694 1213 1213 ? 00:00:00 zeitgeist-fs
1781 1213 1213 ? 00:00:01 gnome-terminal-
1788 1788 1788 pts/4 00:00:00 bash
2079 2079 1788 pts/4 00:00:00 ps
1811 1213 1213 ? 00:00:00 gvfd-network
1832 1213 1213 ? 00:00:00 gvfd-dnssd
1852 1363 1363 ? 00:00:02 evince
1859 1213 1213 ? 00:00:00 evinced
1950 1213 1213 ? 00:00:00 unity-scope-hom
1962 1213 1213 ? 00:00:00 unity-scope-loa
1963 1213 1213 ? 00:00:00 unity-files-dae
817 817 817 tty1 00:00:00 getty
1065 1065 ? 00:00:00 rtkit-daemon
1087 1087 ? 00:00:00 upowerd
1097 1097 ? 00:00:00 colord
1116 1116 1116 ? 00:00:00 systemd
1117 1116 1116 ? 00:00:00 (sd-pam)
1124 1123 1123 ? 00:00:00 gnome-keyring-d
1539 1539 1539 ? 00:00:00 udisksd
1582 631 631 ? 00:00:00 fwupd
2072 2072 2072 ? 00:00:00 systemd-hostnam
Se Okt 1011:28:17khurshidbakhromov@khurshidbakhromov-VirtualBox14$
```

23. This command shows all information about cpu. Address size, power management, cupid level and so on.

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ cat /proc/cpuinfo | more
processor      : 0
vendor_id     : GenuineIntel
cpu family    : 6
model         : 69
model name   : Intel(R) Core(TM) i7-4500U CPU @ 1.80GHz
stepping       : 1
cpu MHz       : 2394.456
cache size    : 4096 KB
physical id   : 0
siblings       : 1
core id       : 0
cpu cores     : 1
apicid        : 0
initial apicid: 0
fpu           : yes
fpu_exception : yes
cpuid level   : 13
wp            : yes
flags          : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge
                  mca cmov pat pse36 clflush mmx fxsr sse sse2 syscall nx rdtscp lm con
                  stant_tsc rep_good noopl xtopology nonstop_tsc pni pclmulqdq monitor ss
                  se3 cx16 sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx rdrand hyperv
isор lahf_lm abm
bugs          :
bogomips     : 4788.91
clflush size  : 64
cache_alignment: 64
address sizes : 39 bits physical, 48 bits virtual
power management:
```

24. This command shows all information about cpu. Address size, power management, cupid level and so on.

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ cat /proc/cpuinfo > infocpu
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

25. This command shows characteristic of CPU. Processor, number of cores, model name, frequency and cache size.

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ grep -e 'processor' -e 'cpu cores' -e 'model name' -e 'cpu MHz' -e 'cache size' infocpu
processor      : 0
model name   : Intel(R) Core(TM) i7-4500U CPU @ 1.80GHz
cpu MHz       : 2394.456
cache size    : 4096 KB
cpu cores     : 1
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

26. This command shows number of Processor

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ grep -c 'processor' infocpu
1
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

27. This command shows number of core in processor

```
khurshidbakromov@khurshidbakromov-VirtualBox:~$ grep -c 'cpu' infocp
4
khurshidbakromov@khurshidbakromov-VirtualBox:~$
```

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28. This command open list of file.

```
8,5      619    2758589 /usr/share/locale-langpack/en/LC_MESSAGES/core
utils.mo
tee      16906    khurshidbakromov   0r    FIFO
,10     0t0     36803 pipe
tee      16906    khurshidbakromov   1u    CHR
,18     0t0     21 /dev/pts/18
tee      16906    khurshidbakromov   2u    CHR
,18     0t0     21 /dev/pts/18
tee      16906    khurshidbakromov   3w    REG
8,5      0     2108534 /home/khurshidbakromov/proc_usefile
lsof     16907    khurshidbakromov cwd    DIR
8,5      4096   2097154 /home/khurshidbakromov
lsof     16907    khurshidbakromov rtd    DIR
8,5      4096    2 /
lsof     16907    khurshidbakromov txt    REG
8,5      163224  2360054 /usr/bin/lsof
lsof     16907    khurshidbakromov mem    REG
8,5      4548736  2367563 /usr/lib/locale/locale-archive
lsof     16907    khurshidbakromov mem    REG
8,5      138696  1060043 /lib/x86_64-linux-gnu/libpthread-2.23.so
lsof     16907    khurshidbakromov mem    REG
8,5      14608   1060049 /lib/x86_64-linux-gnu/libdl-2.23.so
lsof     16907    khurshidbakromov mem    REG
8,5      456632   1053677 /lib/x86_64-linux-gnu/libpcre.so.3.13.2
lsof     16907    khurshidbakromov mem    REG
8,5      1868984  1060060 /lib/x86_64-linux-gnu/libc-2.23.so
lsof     16907    khurshidbakromov mem    REG
8,5      130224   1053706 /lib/x86_64-linux-gnu/libselinux.so.1
lsof     16907    khurshidbakromov mem    REG
8,5      162632   1053171 /lib/x86_64-linux-gnu/ld-2.23.so
lsof     16907    khurshidbakromov 4r    FIFO
,10     0t0     36811 pipe
lsof     16907    khurshidbakromov 7w    FIFO
,10     0t0     36812 pipe
```

29. This command show number of processor

```
khurshidbakromov@khurshidbakromov-VirtualBox:~$ head -5 infocpu
processor      : 0
vendor_id      : GenuineIntel
cpu family     : 6
model          : 69
model name     : Intel(R) Core(TM) i7-4500U CPU @ 1.80GHz
khurshidbakromov@khurshidbakromov-VirtualBox:~$
```

30. This command shows all information about processor

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ head -1 infocpu
processor      : 0
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

31. This command puts head position to tail

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ head -24 infocpu>core4info
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

32. This command gives last information or sentence of processor

```
khurshidbakhromov@khurshidbakhromov-VirtualBox: ~
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ tail -1 infocpu
```

33. This command gives last 5 information about cpu

```
clflush size    : 64
cache_alignment : 64
address sizes   : 39 bits physical, 48 bits virtual
power management:
```

34. This command puts last information to core4info

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ tail -24 infocpu>core4info
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

35. This command shows information put in last example 37 into core4info

```
cpu family      : 6
model          : 69
model name     : Intel(R) Core(TM) i7-4500U CPU @ 1.80GHz
stepping        : 1
cpu MHz         : 2394.456
cache size      : 4096 KB
physical id    : 0
siblings        : 1
core id         : 0
cpu cores       : 1
apicid          : 0
initial apicid : 0
fpu             : yes
fpu_exception   : yes
cpuid level    : 13
wp              : yes
flags           : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge
                  mca cmov pat pse36 clflush mmx fxsr sse sse2 syscall nx rdtscp lm constant_tsc rep_good nopl xtopology nonstop_tsc pni pclmulqdq monitor ss se3 cx16 sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx rdrand hyperv
isор lahf_lm abm
bugs            :
bogomips        : 4788.91
clflush size    : 64
cache_alignment : 64
address sizes   : 39 bits physical, 48 bits virtual
power management:
```

36. This command shows information from core4info last 5 and previous information

```
khurshidbakromov@khurshidbakromov-VirtualBox:~$ cut -b1-25 core4info
cpu family      : 6
model          : 69
model name     : Intel(R) Cor
stepping        : 1
cpu MHz         : 2394.456
cache size      : 4096 KB
physical id    : 0
siblings        : 1
core id         : 0
cpu cores       : 1
apicid          : 0
initial apicid : 0
fpu             : yes
fpu_exception   : yes
cpuid level    : 13
wp              : yes
flags           : fpu vme de pse t
bugs            :
bogomips        : 4788.91
clflush size    : 64
cache_alignment : 64
address sizes   : 39 bits p
power management:
```

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37. This command shows information about core number 0. Shows what kind of processes is going what flags is used

```
0info
processor      : 0
vendor_id      : GenuineIntel
CPU family     : 6
model          : 69
model name     : Intel(R) Core(TM) i7-4500U CPU @ 1.80GHz
stepping        : 1
CPU MHz         : 2394.456
cache size      : 4096 KB
physical id    : 0
siblings        : 1
core id         : 0
CPU cores       : 1
apicid          : 0
initial apicid : 0
fpu             : yes
fpu_exception   : yes
CPUId level   : 13
wp              : yes
flags           : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge
                  mca cmov pat pse36 clflush mmx fxsr sse sse2 syscall nx rdtscp lm con
                  stant_tsc rep_good nopl xtopology nonstop_tsc pn1 pclmulqdq monitor ss
                  se3 cx16 sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx rdrand hyperv
                  isorlahf_lm abm
bugs            :
bogomips        : 4788.91
clflush size    : 64
cache_alignment : 64
address sizes   : 39 bits physical, 48 bits virtual
```

38. This command shows all user files in alphabetical order

```

-rw----- 1 khurshidbakhromov khurshidbakhromov 12288 Feb 15 2017
.[-vi].swp
-rw----- 1 khurshidbakhromov khurshidbakhromov 12288 Feb 16 2017
.[-v].swp
-rw----- 1 khurshidbakhromov khurshidbakhromov 12288 Feb 16 2017
.v.swp
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1340 Apr 23 15:43
waitclkchild.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 738 Apr 23 15:43
waitonchild1.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1491 Apr 23 15:43
waitpid_childao.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1452 Apr 23 15:43
waitpid_childco.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1682 Apr 23 15:43
waitpid_childsleepco.c
-rw----- 1 khurshidbakhromov khurshidbakhromov 73 Okt 11 18:45
.Xauthority
-rw----- 1 khurshidbakhromov khurshidbakhromov 82 Okt 11 18:45
.xsession-errors
-rw----- 1 khurshidbakhromov khurshidbakhromov 1091 Okt 11 01:00
.xsession-errors.old
-rwxrwxr-x 1 khurshidbakhromov khurshidbakhromov 9288 May 5 15:38
z
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1063 Apr 23 15:43
zombie_child1.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1084 Apr 23 15:43
zombie_childn.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1835 Apr 23 15:43
zombie_childpause.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 889 Apr 23 15:43
zombie_childs.c
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1089 Apr 23 15:43
zombie_zombie.c

```

39. This command shows info about listdir

~~3010~~

```

khurshidbakhromov@khurshidbakhromov-VirtualBox: ~
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ cut -b30-60 listdir
cut: listdir: No such file or directory
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

40. This command shows last 10 command typed by user in cmd

~~3010~~

```

khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ history | tail
1777 sudo -apt get listdir
1778 clear
1779 ls -la
1780 clear
1781 cut -b30-60 listdir
1782 cut -b1-25 coreinfo
1783 cat -b30-60 listdir
1784 cat --help
1785 clear
1786 history | tail
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

41. Tell how long system in running

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ uptime  
19:42:30 up 59 min, 1 user, load average: 0.30, 0.15, 0.11  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

42. Estimate file space usage

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ du -sh  
12K ./local/share/gnome-software  
128K ./local/share/gvfs-metadata  
4.0K ./local/share/previews  
3.5M ./local/share/zeitgeist/fts.index  
5.7M ./local/share/zeitgeist  
12K ./local/share/keyrings  
4.0K ./local/share/evolution/mail/trash  
8.0K ./local/share/evolution/mail  
4.0K ./local/share/evolution/calendar/trash  
8.0K ./local/share/evolution/calendar/system  
16K ./local/share/evolution/calendar  
4.0K ./local/share/evolution/tasks/trash  
8.0K ./local/share/evolution/tasks/system  
16K ./local/share/evolution/tasks  
4.0K ./local/share/evolution/addressbook/trash  
4.0K ./local/share/evolution/addressbook/system  
32K ./local/share/evolution/addressbook/system  
40K ./local/share/evolution/addressbook  
4.0K ./local/share/evolution/memos/trash  
8.0K ./local/share/evolution/memos  
92K ./local/share/evolution  
4.0K ./local/share/nautilus/scripts  
8.0K ./local/share/nautilus  
4.0K ./local/share/totem  
8.0K ./local/share/Trash/info  
28K ./local/share/Trash/files  
4.0K ./local/share/Trash/expunged  
44K ./local/share/Trash  
6.2M ./local/share  
6.2M ./local  
8.0K ./gconf/apps/aisleriot  
12K ./gconf/apps  
16K ./gconf  
510M .  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

43. This command show space used.

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ du -sh  
510M .  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

44. This command shows size of files in increasing order

```
khurshidbakhromov@khurshidbakhromov-VirtualBox: ~
```

```
4.0K    fork4.c
4.0K    fork5.c
4.0K    fork6.c
4.0K    fork7.c
4.0K    fork8.c
4.0K    fork9.c
4.0K    infocpu
4.0K    Music
4.0K    Public
4.0K    shellnew.c
4.0K    simpwait_childao.c
4.0K    Templates
4.0K    Videos
4.0K    waitclktchild.c
4.0K    waitonchild1.c
4.0K    waitpid_childao.c
4.0K    waitpid_childco.c
4.0K    waitpid_childsleepco.c
4.0K    zombie_child1.c
4.0K    zombie_childn.c
4.0K    zombie_childpause.c
4.0K    zombie_childs.c
4.0K    zombie_childsleep.c
6.9M    Untitled Folder
12K    examples.desktop
12K    fork
12K    shell
12K    z
44K    Desktop
44K    Q2
56K    Task2
156M   lab4
157M   Downloads
264K   Lab6
```

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45. This command shows size of files in decreasing order

```
khurshidbakhromov@khurshidbakhromov-VirtualBox: ~
```

```
4.0K    waitpid_childao.c
4.0K    waitonchild1.c
4.0K    waitclktchild.c
4.0K    Videos
4.0K    Templates
4.0K    simpwait_childao.c
4.0K    shellnew.c
4.0K    Public
4.0K    Music
4.0K    infocpu
4.0K    fork9.c
4.0K    fork8.c
4.0K    fork7.c
4.0K    fork6.c
4.0K    fork5.c
4.0K    fork4.c
4.0K    fork3.c
4.0K    fork2.c
4.0K    fork1.c
4.0K    fork10.c
4.0K    Documents
4.0K    core4info
4.0K    core0info
2.6M    proc_usefile
264K   Lab6
2.3M   Pictures
157M   Downloads
156M   lab4
12K    z
12K    shell
12K    fork
12K    examples.desktop
1.1M   Q1
0      nfact.c
khurshidbakhromov@khurshidbakhromov-VirtualBox: ~
```

46. This command compress or expand files

```
khurshidbakhromov@khurshidbakhromov-VirtualBox: ~  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ gzip infocpu
```

47. This command shows all information about files in root directory

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ ls -l info *  
ls: cannot access 'info': No such file or directory  
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 723 Okt 11 19:09  
core0info  
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 703 Okt 11 19:15  
core4info  
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 8980 Fev 13 2017  
examples.desktop  
-rwxrwxr-x 1 khurshidbakhromov khurshidbakhromov 9016 May 5 14:30  
fork  
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1060 Apr 23 15:43  
fork10.c  
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 661 Apr 23 15:43  
fork1.c  
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 707 Apr 23 15:43  
fork2.c  
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 556 Apr 23 15:43  
fork3.c  
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 774 Apr 23 15:43  
fork4.c  
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 827 Apr 23 15:43  
fork5.c  
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1047 Apr 23 15:43  
fork6.c  
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1066 Apr 23 15:43  
fork7.c  
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1682 Apr 23 15:43  
fork8.c  
-rw-r--r-- 1 khurshidbakhromov khurshidbakhromov 1060 Apr 23 15:43  
fork9.c
```

48. This command compress or expand files

```
khurshidbakhromov@khurshidbakhromov-VirtualBox: ~  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ gunzip infocpu.gz
```

49. This command shows all information about files in root directory

SOC

```
qwer.c
-rwxrwxrwx 1 khurshidbakhromov khurshidbakhromov 1824 Noy  6  2016
t10.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 296 Mar 22 2017
t11.s
-rwxrwxrwx 1 khurshidbakhromov khurshidbakhromov 518 Noy  5  2016
t12.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 1371 Mar 22 2017
t1.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 759 Mar 21 2017
t2.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 349 Mar 22 2017
t3.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 349 Mar 22 2017
t4.s
-rwxrwxrwx 1 khurshidbakhromov khurshidbakhromov 1649 Mar 22 2017
t5.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 1325 Mar 22 2017
t6.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 678 Mar 22 2017
t7.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 511 Mar 22 2017
t8.s
-rwxrwxrwx 1 khurshidbakhromov khurshidbakhromov 560 Mar 21 2017
task08.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 709 Mar 21 2017
task1.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 3018 Mar  3  2017
task5.c
-rwxrwxr-x 1 khurshidbakhromov khurshidbakhromov 8720 Mar  3  2017
who

Videos:
total 0
```

50. Create a compressed file where put cpu information

```
khurshidbakhromov@khurshidbakhromov-VirtualBox: ~
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ bzip2 infocpu
```

51. This command shows detailed information of all files

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```
khurshidbakhromov@khurshidbakhromov-VirtualBox: ~
t10.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 296 Mar 22 201
t11.s
-rwxrwxrwx 1 khurshidbakhromov khurshidbakhromov 518 Noy 5 201
t12.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 1371 Mar 22 201
t1.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 759 Mar 21 201
t2.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 349 Mar 22 201
t3.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 349 Mar 22 201
t4.s
-rwxrwxrwx 1 khurshidbakhromov khurshidbakhromov 1649 Mar 22 201
t5.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 1325 Mar 22 201
t6.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 678 Mar 22 201
t7.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 511 Mar 22 201
t8.s
-rwxrwxrwx 1 khurshidbakhromov khurshidbakhromov 560 Mar 21 201
task08.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 709 Mar 21 201
task1.s
-rw-rw-r-- 1 khurshidbakhromov khurshidbakhromov 3018 Mar 3 201
task5.c
-rwxrwxr-x 1 khurshidbakhromov khurshidbakhromov 8720 Mar 3 201
who

Videos:
total 8
drwxr-xr-x 2 khurshidbakhromov khurshidbakhromov 4096 Fev 13 2017 .
drwxr-xr-x 26 khurshidbakhromov khurshidbakhromov 4096 Okt 11 20:18 .
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

52. Create a zip file with cpu information

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ bunzip2 infocpu.bz2
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

53. Show cpu information

```
khurshidbakromov@khurshidbakromov-VirtualBox:~$ cat infocpu
processor      : 0
vendor_id     : GenuineIntel
cpu family    : 6
model         : 69
model name    : Intel(R) Core(TM) i7-4500U CPU @ 1.80GHz
stepping       : 1
cpu MHz        : 2394.456
cache size    : 4096 KB
physical id   : 0
siblings       : 1
core id        : 0
cpu cores     : 1
apicid         : 0
initial apicid: 0
fpu            : yes
fpu_exception  : yes
cpuid level   : 13
wp             : yes
flags          : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge
                  mca cmov pat pse36 clflush mmx fxsr sse sse2 syscall nx rdtscp lm con
                  stant_tsc rep_good nopl xtopology nonstop_tsc pni pclmulqdq monitor ss
                  se3 cx16 sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx rdrand hyperv
                  isorlahf_lm abm
bogus          :
bogomips      : 4788.91
clflush size  : 64
cache_alignment: 64
address sizes  : 39 bits physical, 48 bits virtual
power management:
```

```
khurshidbakromov@khurshidbakromov-VirtualBox:~$
```

54. Show information stored in cache

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```
KhurshidBakhromov@KhurshidBakhromov-VirtualBox:~$ cat -n infocpu
 1 processor      : 0
 2 vendor_id     : GenuineIntel
 3 cpu family    : 6
 4 model         : 69
 5 model name    : Intel(R) Core(TM) i7-4500U CPU @ 1.80GHz
 6 stepping       : 1
 7 cpu MHz        : 2394.456
 8 cache size    : 4096 KB
 9 physical id   : 0
10 siblings       : 1
11 core id        : 0
12 cpu cores      : 1
13 apicid         : 0
14 initial apicid : 0
15 fpu            : yes
16 fpu_exception  : yes
17 cpuid level   : 13
18 wp             : yes
19 flags          : fpu vme de pse tsc msr pae mce cx8 apic sep
mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 syscall nx rdtsc
p lm constant_tsc rep_good nopl xtopology nonstop_tsc pni pclmulqdq mo
nitor ssse3 cx16 sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx rdran
d hypervisor lahf_lm abm
20 bugs           :
21 bogomips       : 4788.91
22 clflush size   : 64
23 cache_alignment : 64
24 address sizes  : 39 bits physical, 48 bits virtual
25 power management:
26
KhurshidBakhromov@KhurshidBakhromov-VirtualBox:~$
```

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55. This command show info of processor

```
KhurshidBakhromov@KhurshidBakhromov-VirtualBox:~$ nl infocpu
 1 processor      : 0
 2 vendor_id     : GenuineIntel
 3 cpu family    : 6
 4 model         : 69
 5 model name    : Intel(R) Core(TM) i7-4500U CPU @ 1.80GHz
 6 stepping       : 1
 7 cpu MHz        : 2394.456
 8 cache size    : 4096 KB
 9 physical id   : 0
10 siblings       : 1
11 core id        : 0
12 cpu cores      : 1
13 apicid         : 0
14 initial apicid : 0
15 fpu            : yes
16 fpu_exception  : yes
17 cpuid level   : 13
18 wp             : yes
19 flags          : fpu vme de pse tsc msr pae mce cx8 apic sep
mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 syscall nx rdtsc
p lm constant_tsc rep_good nopl xtopology nonstop_tsc pni pclmulqdq mo
nitor ssse3 cx16 sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx rdran
d hypervisor lahf_lm abm
20 bugs           :
21 bogomips       : 4788.91
22 clflush size   : 64
23 cache_alignment : 64
24 address sizes  : 39 bits physical, 48 bits virtual
25 power management:
```

56. This command convert text files for printing.

```
khurshidbakromov@khurshidbakromov-VirtualBox:~$ pr -n infocpu
```

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1		
1 processor : 0		
2 vendor_id : GenuineIntel		
3 cpu family : 6		
4 model : 69		
5 model name : Intel(R) Core(TM) i7-4500U CPU @ 1.80GHz		
6 stepping : 1		
7 cpu MHz : 2394.456		
8 cache size : 4096 KB		
9 physical id : 0		
10 siblings : 1		
11 core id : 0		
12 cpu cores : 1		
13 apicid : 0		
14 initial apicid : 0		
15 fpu : yes		
16 fpu_exception : yes		
17 cpuid level : 13		
18 wp : yes		
19 flags : fpu vme de pse tsc msr pae mce cx8 apic sep		
nttr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 syscall nx rdtsc		
lm constant_tsc rep_good nopl xtopology nonstop_tsc pni pclmulqdq mo		
nitor ssse3 cx16 sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx rdran		
d hypervisor lahf_lm abm		
20 bugs :		
21 bogomips : 4788.91		
22 clflush size : 64		

57. This command print lines matching pattern

```
khurshidbakromov@khurshidbakromov-VirtualBox:~$ grep -o 'Unix' | we-  
1  
we-1: command not found  
W  
  
[2]+ Stopped grep --color=auto -o 'Unix' | we-1  
khurshidbakromov@khurshidbakromov-VirtualBox:~$ █
```

58. This command report file system space usage. Limit like listing to local file systems

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ df -kl
Filesystem      1K-blocks    Used Available Use% Mounted on
udev              2003644      0   2003644  0% /dev
tmpfs             404660    6144   398516  2% /run
/dev/sda5       56078684  6219348  46987632 12% /
tmpfs            2023296   3996  2019300  1% /dev/shm
tmpfs              5120       4    5116  1% /run/lock
tmpfs            2023296      0  2023296  0% /sys/fs/cgroup
tmpfs             404660     72  404588  1% /run/user/1000
```

59. This command report file system space usage. Print sizes in powers of 1024

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ df -kh
Filesystem      Size  Used Avail Use% Mounted on
udev            2.0G    0  2.0G  0% /dev
tmpfs           396M  6.0M 390M  2% /run
/dev/sda5        54G  6.0G  45G 12% /
tmpfs            2.0G  4.0M  2.0G  1% /dev/shm
tmpfs            5.0M  4.0K  5.0M  1% /run/lock
tmpfs            2.0G    0  2.0G  0% /sys/fs/cgroup
tmpfs           396M   72K  396M  1% /run/user/1000
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

60. This command show path from home directory

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ echo $PATH
/home/khurshidbakhromov/bin:/home/khurshidbakhromov/.local/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

61. This command saves value to a%rax register

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ a=$(expr 15+10)
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

62. This command print saved value from a

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ echo $a
15+10
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

63. This command saves value 75 to b

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ let b=75
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

64. This command print value of b which was saved in previous example

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ echo $b  
75  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

65. This command saves sum of values from a and b to c

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ let c=$a+$b  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

66. This command print sum of values 75+15+10 which is 100

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ let c=100  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ echo $c  
100  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

67. In this case sum of two values saved in D

```
bash: syntax error near unexpected token `'  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ D=$((15+25))  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

68. Shows sum of values

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ echo $D  
40  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

69. Shows path to home directory

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ echo $HOME  
/home/khurshidbakhromov  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

70. This command search for file named linux in repository

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ find -name linux  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

71. This command make ls as list

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ ls>list  
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

72. Shows all file in home folder

```
fork5.c
fork6.c
fork7.c
fork8.c
fork9.c
infocpu
lab4
Lab6
list
Music
nfact.c
Pictures
proc_usefile
Public
Q1
Q2
shell
shellnew.c
simpwait_childao.c
Task2
Templates
Untitled Folder
Videos
waitclkchild.c
waitonchild1.c
waitpid_childao.c
waitpid_childco.c
waitpid_childsleepco.c
z
zombie_child1.c
zombie_chldn.c
zombie_chldpause.c
zombie_childs.c
zombie_childsleep.c
```

75. This command reverse line characterwise

76. Shows all file in home folder

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```
ofni0eroc  
ofni4eroc  
potkseD  
stnemucoD  
sdaolnwoD  
potksed.selpmaxe  
krof  
c.01krof  
c.1krof  
c.2krof  
c.3krof  
c.4krof  
c.5krof  
c.6krof  
c.7krof  
c.8krof  
c.9krof  
upcofni  
4bal  
6baL  
tsil  
cisum  
c.tcafN  
serutcip  
elifeSu_corp  
cilbuP  
1Q  
2Q  
llehs  
c.wenllehs  
c.oadlihc_tiaWpmis
```

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```
fork5.c  
fork6.c  
fork7.c  
fork8.c  
fork9.c  
infocpu  
lab4  
Lab6  
list  
Music  
nfact.c  
Pictures  
proc_usefile  
Public  
Q1  
Q2  
shell  
shellnew.c  
simpwait_childao.c  
Task2  
Templates  
Untitled Folder  
Videos  
waitclktchild.c  
waitonchild1.c  
waitpid_childao.c  
waitpid_childco.c  
waitpid_childsleepco.c  
z  
zombie_child1.c  
zombie_childn.c  
zombie_childpause.c  
zombie_childs.c  
zombie_childsleep.c  
khurshidbakromov@khurs
```

75. This command reverse whole sentence

```
khurshidbakromov@khurshidbakromov-VirtualBox:~$ echo 'HELLO GOOD MOR  
NING! HOW ARE YOU' | rev  
UOY ERA WOH !GNINROM DOOG OLLEH
```

76. Make links between lines

```
khurshidbakromov@khurshidbakromov-VirtualBox:~$ ln list list1
```

77. Use a long listing format

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ ls -l lis*
-rw-rw-r-- 2 khurshidbakhromov khurshidbakhromov 478 Okt 11 23:57 list
-rw-rw-r-- 2 khurshidbakhromov khurshidbakhromov 478 Okt 11 23:57 list
1
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

78. This command make symbolic links instead of hard links

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ ln -s list list2
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$
```

79. Change name of shell username

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ PS1="LSS"
LSS$
```

80. This command shows all lists

```
khurshidbakhromov@khurshidbakhromov-VirtualBox:~$ ls -l lis*
-rw-rw-r-- 2 khurshidbakhromov khurshidbakhromov 478 Okt 11 23:57 list
-rw-rw-r-- 2 khurshidbakhromov khurshidbakhromov 478 Okt 11 23:57 list
1
lrwxrwxrwx 1 khurshidbakhromov khurshidbakhromov     4 Okt 12 00:07 list
2 -> list
LSS$
```

81. This command search list which start with word l

```
LSS$ls -ltr | grep '^l'
lrwxrwxrwx 1 khurshidbakhromov khurshidbakhromov     4 Okt 12 00:07
list2 -> list
LSS$
```

84. Print all files from list1

85. Print all files from list1

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fork5.c fork6.c fork7.c fork8.c fork9.c infocpu lab4 Lab6 list Music nfact.c Pictures proc_usefile Public Q1 Q2 shell shellnew.c simpwait_childao.c Task2 Templates Untitled Folder Videos waitclkchild.c waitonchild1.c waitpid_childao.c waitpid_childco.c waitpid_childsleepco.c z zombie_child1.c zombie_childn.c zombie_childpause.c zombie_childs.c zombie_childsleep.c	Q1>	Pictures proc_usefile Public Q1 Q2 shell shellnew.c simpwait_childao.c Task2 Templates Untitled Folder Videos waitclkchild.c waitonchild1.c waitpid_childao.c waitpid_childco.c waitpid_childsleepco.c z zombie_child1.c zombie_childn.c zombie_childpause.c zombie_childs.c zombie_childsleep.c khurshidbakromov@khurshidbakromov-VirtualBox:~\$
--	-----	---

84. Determines list type

```
LS$ file list
list: core file (Xenix)
LS$
```

85. Determines list type

```
OS
LS$ file list
list: core file (Xenix)
LS$
```

86. Determine list type which is symbolic relation

```
OS
khurshidbakromov@khurshidbakromov-VirtualBox:~$ file list2
list2: symbolic link to list
khurshidbakromov@khurshidbakromov-VirtualBox:~$
```

87. Determine file type which is directory

```
LS$file Desktop  
Desktop: directory  
LSS$
```

2A.90.png

91) gives all files in current directory with extension .o and its information

```
parallels@ubuntu: ~/OS/OperatingSystemHW1  
[Ubuntu icon]parallels@ubuntu:~/OS/OperatingSystemHW1$ file *.o  
*.o: cannot open `*.o' (No such file or directory)  
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

92) gives all files current directory with extension .c and its information

```
parallels@ubuntu: ~/OS/OperatingSystemHW1  
[Ubuntu icon]parallels@ubuntu:~/OS/OperatingSystemHW1$ file *.c  
file_oper.c: C source, ASCII text  
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

93) gives all files current directory with extension .sh and its information

```
parallels@ubuntu: ~/OS/OperatingSystemHW1  
[Ubuntu icon]parallels@ubuntu:~/OS/OperatingSystemHW1$ file *.sh  
array.sh: Bourne-Again shell script, ASCII text executable  
case.sh: Bourne-Again shell script, ASCII text executable  
cfiles.sh: Bourne-Again shell script, ASCII text executable  
copy.sh: Bourne-Again shell script, ASCII text executable  
fact.sh: Bourne-Again shell script, ASCII text executable  
fcount.sh: Bourne-Again shell script, ASCII text executable  
flist.sh: Bourne-Again shell script, ASCII text executable  
fsort.sh: Bourne-Again shell script, ASCII text executable  
len.sh: Bourne-Again shell script, ASCII text executable  
maxlist.sh: Bourne-Again shell script, ASCII text executable  
max.sh: Bourne-Again shell script, ASCII text executable  
proc_invok.sh: Bourne-Again shell script, ASCII text executable  
sample.sh: Bourne-Again shell script, ASCII text executable  
select.sh: Bourne-Again shell script, ASCII text executable  
sumodd.sh: Bourne-Again shell script, ASCII text executable  
var.sh: Bourne-Again shell script, ASCII text executable
```

94) gives all files in current directory with its information

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```

parallels@ubuntu:~/OS/OperatingSystemHW1
parallels@ubuntu:~/OS/OperatingSystemHW1$ file *
alices_file:          ASCII text, with no line terminators
array.sh:              Bourne-Again shell script, ASCII text executable
Assignment.md:        ASCII text
case.sh:               Bourne-Again shell script, ASCII text executable
cfiles.sh:              Bourne-Again shell script, ASCII text executable
copy.sh:               Bourne-Again shell script, ASCII text executable
copyto_file:            ASCII text, with no line terminators
fact.sh:               Bourne-Again shell script, ASCII text executable
fcount.sh:              Bourne-Again shell script, ASCII text executable
file:                 ASCII text
file_oper:             ELF 64-bit LSB shared object, x86-64, version 1 (SYSV),
Linux 2.6.32, BuildID[sha1]=902f576d28b835fd58b0d38e08306d4505f6e0fd, not stripped
file_oper.c:            C source, ASCII text
file_oper.c:            Bourne-Again shell script, ASCII text executable
file_oper.c:            Bourne-Again shell script, ASCII text executable
HW1.docx:              Microsoft Word 2007+
len.sh:                Bourne-Again shell script, ASCII text executable
maxlist.sh:              Bourne-Again shell script, ASCII text executable
max.sh:                Bourne-Again shell script, ASCII text executable
names:                 ASCII text
OS_HOME_ASSIGNMENT_1.pdf: PDF document, version 1.7
proc_invok.sh:          Bourne-Again shell script, ASCII text executable
README.md:              ASCII text
sample.sh:              Bourne-Again shell script, ASCII text executable
select.sh:              Bourne-Again shell script, ASCII text executable
some_another_file:      ASCII text, with no line terminators
sumodd.sh:              Bourne-Again shell script, ASCII text executable
Tolqinjon:              ASCII text
Ulugbek:               ASCII text
var.sh:                Bourne-Again shell script, ASCII text executable
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

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95) show content of given file

```

parallels@ubuntu:~/OS/OperatingSystemHW1
parallels@ubuntu:~/OS/OperatingSystemHW1$ cat core4info
1) PS1="\d \t \u@\h \#\$\"
2) ls -lt
3) ls -lrt
4) ls --help
5) cd ~
6) cat .profile
7) uname -r
8) uname -a
9) uname -n
10) uname -o
11) uname -p
12) arch
13) touch nfact.c
14) ls-l nfact.c
15) chmod +x nfact.c
16) ls-l nfact.c
17) cat nfact.c
18) history
19) history 25
20) df
21) df -h
22) top
23) ps -la
24) ps -ef
25) ps -ejH
26) cat /proc/cpuinfo | more
27) cat /proc/cpuinfo >infocpu
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

96) first takes 14 lines from beginning as content and shows 1 line from the end of taken content from file

```
parallels@ubuntu: ~/OS/OperatingSystemHW1
parallels@ubuntu:~/OS/OperatingSystemHW1$ head -14 core4info |tail -1
14)ls-l nfact.c
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

97) delete 1st row from core4info, -i means insertion

98) shows content of core4info

```
parallels@ubuntu: ~/OS/OperatingSystemHW1
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -i '1d' core4info
2) ls -lt
3) ls -lrt
4) ls --help
5) cd ~
6) cat .profile
7) uname -r
8) uname -a
9) uname -n
10) uname -o
11) uname -p
12) arch
13)touch nfact.c
14)ls-l nfact.c
15) chmod +x nfact.c
16)ls-l nfact.c
17) cat nfact.c
18) history
19) history 25
20) df
21) df -h
22) top
23)ps -la
24)ps -ef
25)ps -ejH
26) cat /proc/cpuinfo | more
27)cat /proc/cpuinfo >infocpu
parallels@ubuntu: ~/OS/OperatingSystemHW1$
```

99) delete the last row from core4info file

100) shows content of core4info file

```
parallels@ubuntu: ~/OS/OperatingSystemHW1
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -i '$d' core4info
2) ls -lt
3) ls -lrt
4) ls --help
5) cd ~
6) cat .profile
7) uname -r
8) uname -a
9) uname -n
10) uname -o
11) uname -p
12) arch
13)touch nfact.c
14)ls-l nfact.c
15) chmod +x nfact.c
16)ls-l nfact.c
17) cat nfact.c
18) history
19) history 25
20) df
21) df -h
22) top
23)ps -la
24)ps -ef
25)ps -ejH
26) cat /proc/cpuinfo | more
parallels@ubuntu: ~/OS/OperatingSystemHW1$
```

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- 101) prints 13 line of core4info
- 102) prints byte count in 13th line
- 103) prints word count in 13th line
- 104) prints reverse version of 13th line

```
parallels@ubuntu: ~/OS/OperatingSystemHW1
[parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '13p' core4info
14)ls-l nfact.c
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '13p' core4info | wc -c
18
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '13p' core4info | wc -w
2
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '13p' core4info | rev
c.tcafni l-sl)41
parallels@ubuntu:~/OS/OperatingSystemHW1$ ]
```

- 105) prints from 13th to 18th the line
- 106) prints new line counts from 13th to 18the line
- 107) prints word count from 13th line to 18th line
- 108) prints byte count fro 13th line to 18th line
- 109) prints the last row of the core4info file

```
parallels@ubuntu: ~/OS/OperatingSystemHW1
[parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '13,18p' core4info
14)ls-l nfact.c
15) chmod +x nfact.c
16)ls-l nfact.c
17) cat nfact.c
18) history
19) history 25
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '13,18p' core4info |wc -l
6
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '13,18p' core4info |wc -w
16
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '13,18p' core4info |wc -c
100
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '$p' core4info
26) cat /proc/cpuinfo | more
parallels@ubuntu:~/OS/OperatingSystemHW1$ ]
```

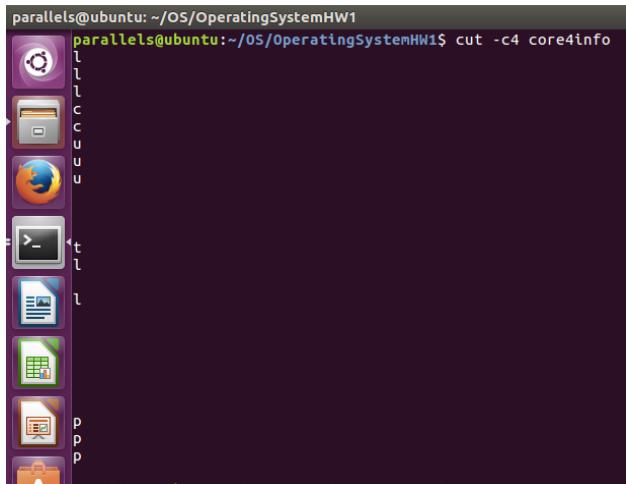
- 110) the first it takes reverse string, then split by delimiter and takes the first word, then prints reverse version of this word

- 111) the first it splits string by the delimiter and prints the 4th element taken array

```
parallels@ubuntu: ~/OS/OperatingSystemHW1
[parallels@ubuntu:~/OS/OperatingSystemHW1$ echo 'GNU is Not Unix'|rev| cut -f1 -d' '|rev
Unix
parallels@ubuntu:~/OS/OperatingSystemHW1$ echo 'GNU is Not Unix'| cut -f4 -d' '
Unix
parallels@ubuntu:~/OS/OperatingSystemHW1$ ]
```

- 112) prints 4th element from every row

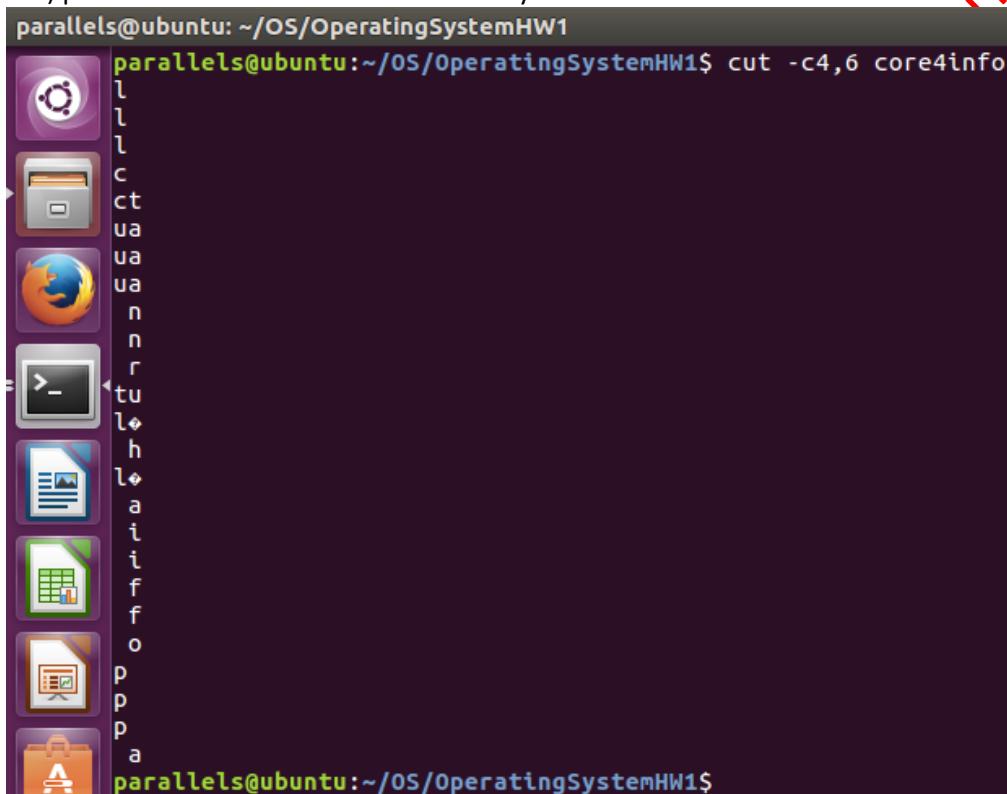
COMING SOON



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -c4 core4info
```

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113) prints 4th and 6th elements from every row

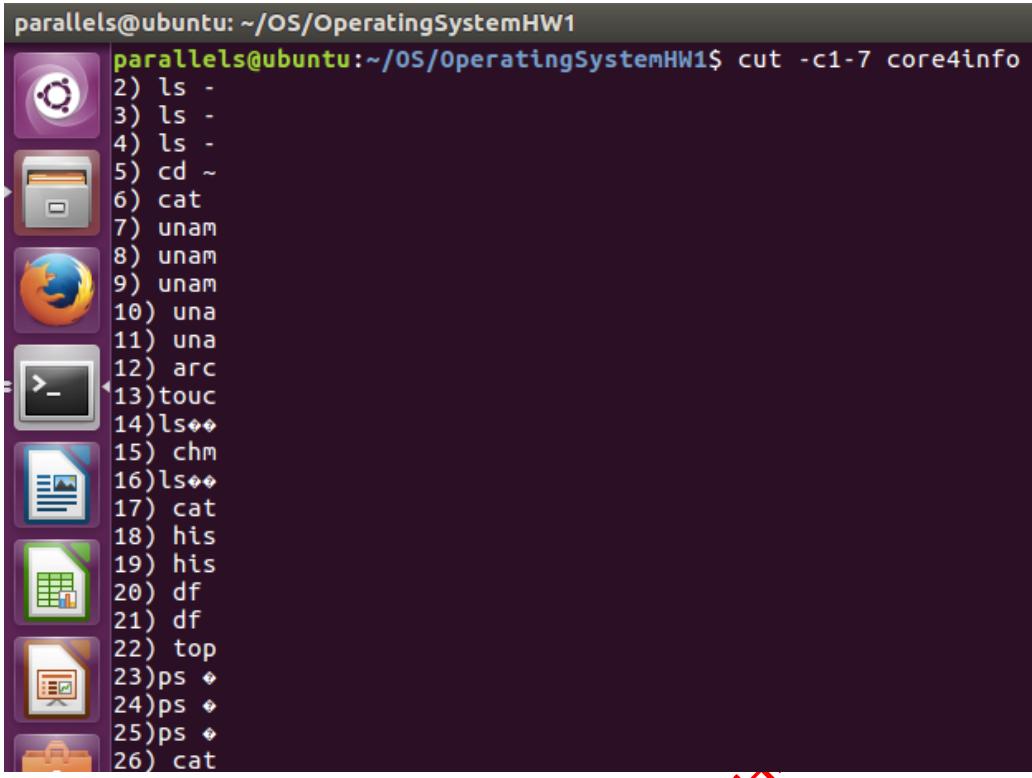


```
parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -c4,6 core4info
```

114) prints from 1st to 7th element in every row

SOC 301

parallels@ubuntu: ~/OS/OperatingSystemHW1

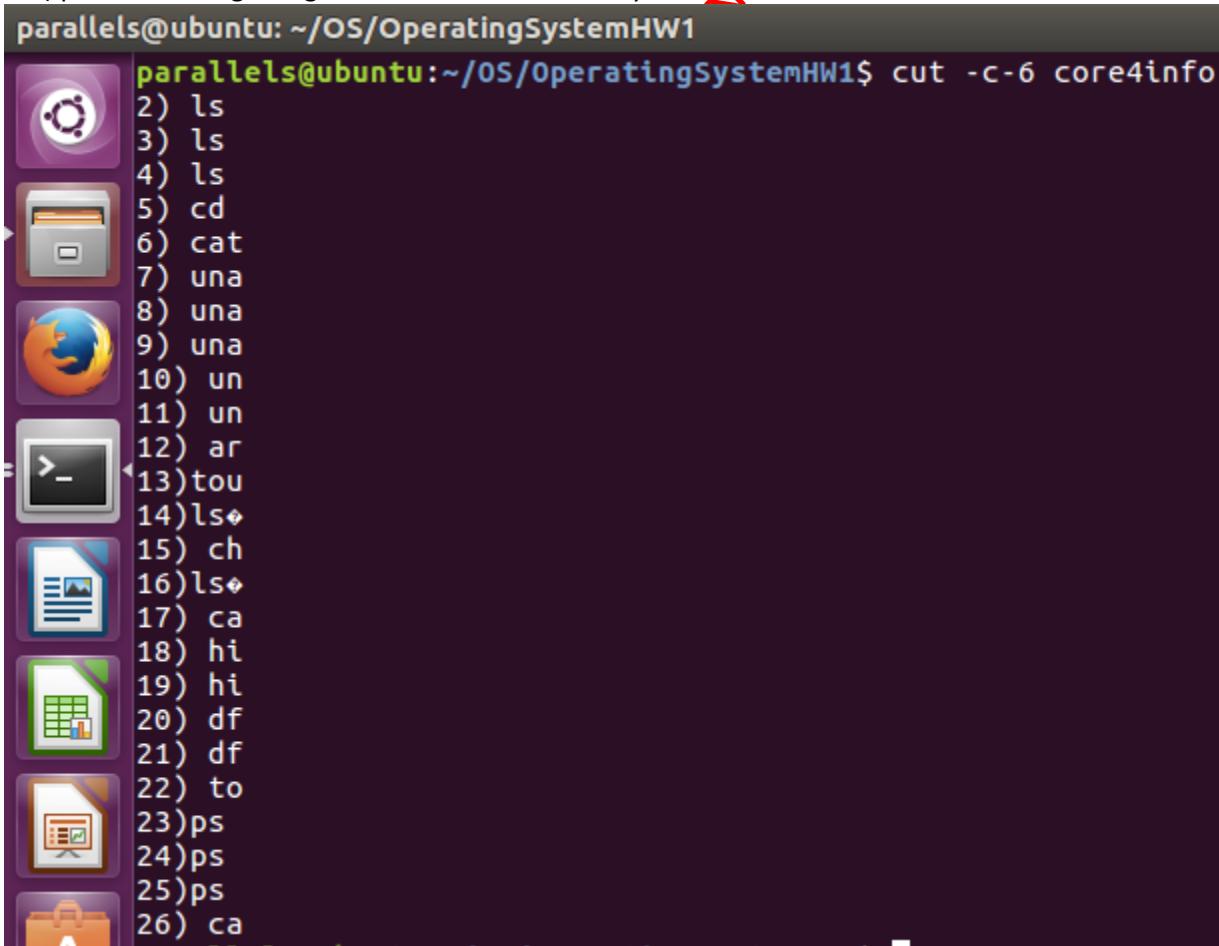


```
parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -c1-7 core4info
2) ls -
3) ls -
4) ls -
5) cd ~
6) cat
7) unam
8) unam
9) unam
10) una
11) una
12) arc
13) touc
14) ls♦♦
15) chm
16) ls♦♦
17) cat
18) his
19) his
20) df
21) df
22) top
23) ps ♦
24) ps ♦
25) ps ♦
26) cat
```

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115) prints from beginning till 6th element from every row

parallels@ubuntu: ~/OS/OperatingSystemHW1



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -c-6 core4info
2) ls
3) ls
4) ls
5) cd
6) cat
7) una
8) una
9) una
10) un
11) un
12) ar
13) touc
14) ls♦
15) ch
16) ls♦
17) ca
18) hi
19) hi
20) df
21) df
22) to
23) ps
24) ps
25) ps
26) ca
```

116) prints from 10th till end of every row

```
parallels@ubuntu: ~/OS/OperatingSystemHW1
```



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -c10- file  
p - you say how high.  
eed your help.  
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

117) ~~~it gives error~~~

118) prints 2nd element of array which is taken from splitting by delimiter from each row(new line)



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -f2 -d' ' core4info  
ls  
ls  
ls  
cd  
cat  
uname  
uname  
uname  
uname  
uname  
arch  
nfact.c  
nfact.c  
chmod  
nfact.c  
cat  
history  
history  
df  
df  
top  
-la  
-ef  
-ejH  
cat
```

119) prints from 1st till 2nd element of an array which is taken from splitting by delimiter from each row



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -f1-2 -d' ' core4info  
2) ls  
3) ls  
4) ls  
5) cd  
6) cat  
7) uname  
8) uname  
9) uname  
10) uname  
11) uname  
12) arch  
13)touch nfact.c  
14)ls-l nfact.c  
15) chmod  
16)ls-l nfact.c  
17) cat  
18) history  
19) history  
20) df  
21) df  
22) top  
23)ps -la  
24)ps -ef  
25)ps -ejH  
26) cat  
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

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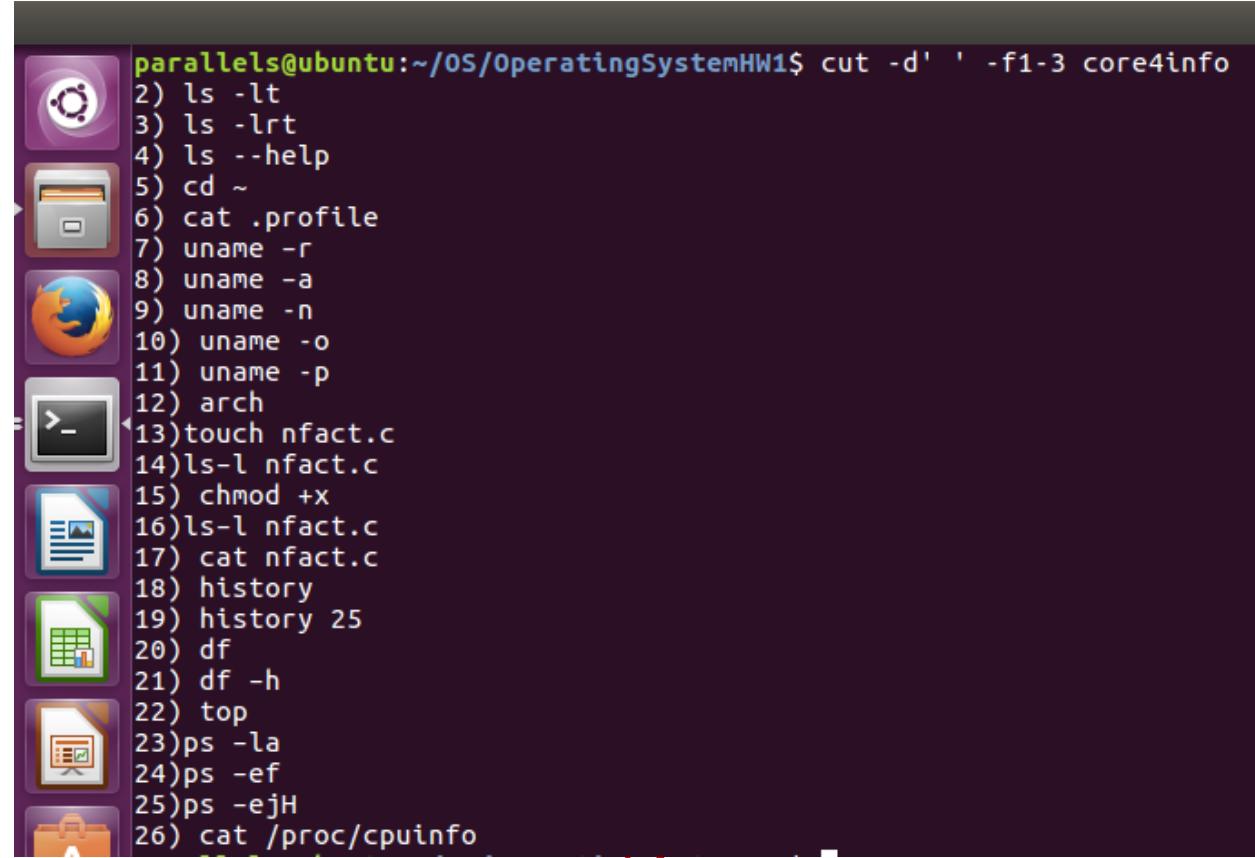
120) the same as 118

```
parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -d' ' -f2 core4info
ls
ls
ls
cd
cat
uname
uname
uname
uname
uname
arch
nfact.c
nfact.c
chmod
nfact.c
cat
history
history
df
df
top
-la
-ef
-ejh
cat
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

121) prints 2nd and 3rd element of an array which is taken by splitting by delimiter from each row

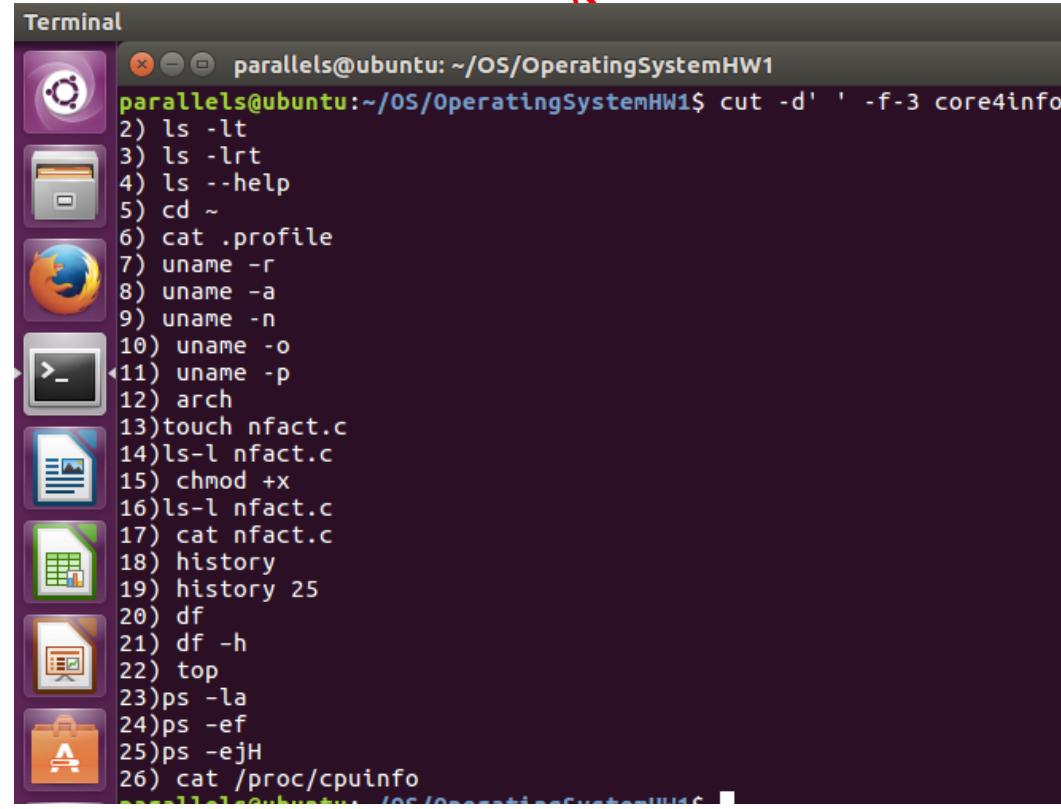
```
parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -d' ' -f2,3 core4info
ls -lt
ls -lrt
ls --help
cd ~
cat .profile
uname -r
uname -a
uname -n
uname -o
uname -p
arch
nfact.c
nfact.c
chmod +x
nfact.c
cat nfact.c
history
history 25
df
df -h
top
-la
-ef
-ejh
cat /proc/cpuinfo
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

122) prints from 1st till 3rd element of an array which is taken by splitting by delimiter from each row



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -d' ' -f1-3 core4info
2) ls -lt
3) ls -lrt
4) ls --help
5) cd ~
6) cat .profile
7) uname -r
8) uname -a
9) uname -n
10) uname -o
11) uname -p
12) arch
13)touch nfact.c
14)ls-l nfact.c
15) chmod +x
16)ls-l nfact.c
17) cat nfact.c
18) history
19) history 25
20) df
21) df -h
22) top
23)ps -la
24)ps -ef
25)ps -ejH
26) cat /proc/cpuinfo
```

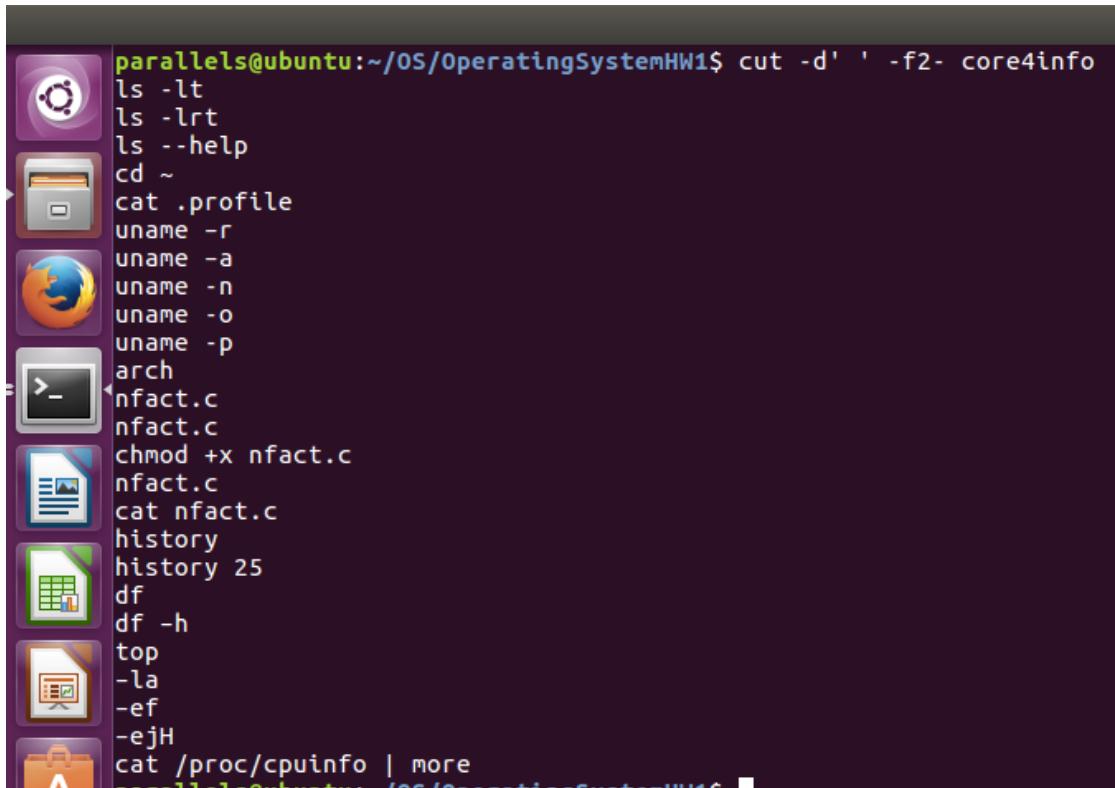
123) prints from beginnging till 3rd element of an array which is taken by splitting by delimiter from each row



REDACTED

```
parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -d' ' -f1-3 core4info
2) ls -lt
3) ls -lrt
4) ls --help
5) cd ~
6) cat .profile
7) uname -r
8) uname -a
9) uname -n
10) uname -o
11) uname -p
12) arch
13)touch nfact.c
14)ls-l nfact.c
15) chmod +x
16)ls-l nfact.c
17) cat nfact.c
18) history
19) history 25
20) df
21) df -h
22) top
23)ps -la
24)ps -ef
25)ps -ejH
26) cat /proc/cpuinfo
```

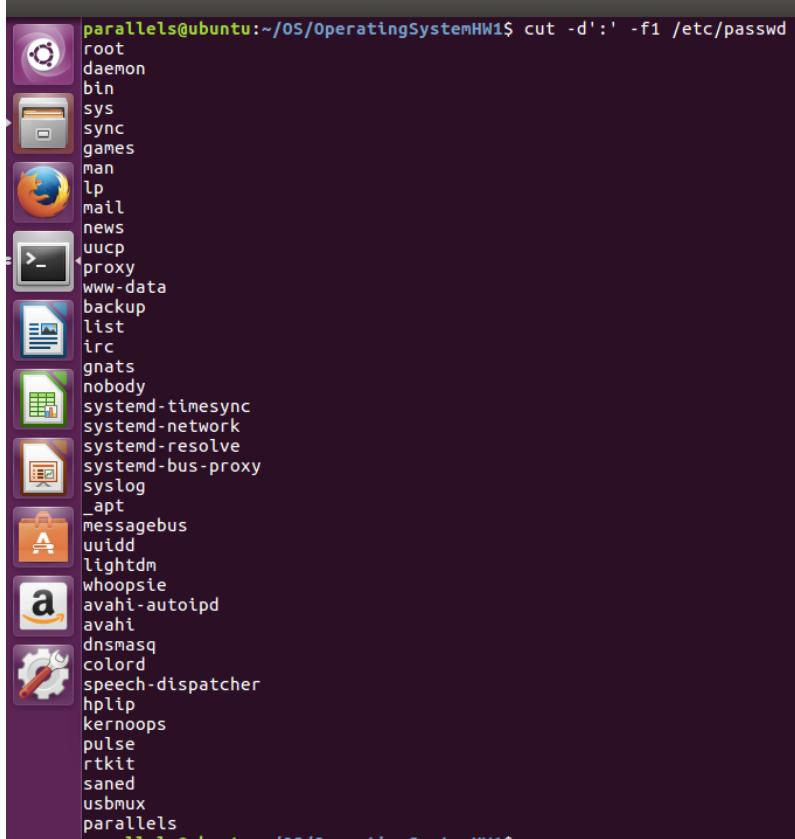
124) prints from 2nd till end of an array which is taken by splitting by delimiter from each row



parallels@ubuntu:~/OS/OperatingSystemHW1\$ cut -d' ' -f2- core4info
ls -lt
ls -lrt
ls --help
cd ~
cat .profile
uname -r
uname -a
uname -n
uname -o
uname -p
arch
nfact.c
nfact.c
chmod +x nfact.c
nfact.c
cat nfact.c
history
history 25
df
df -h
top
-la
-ef
-ejH
cat /proc/cpuinfo | more

^ 2017

125) prints 1st element of an array which is splitted by delimiter ':' of every row



parallels@ubuntu:~/OS/OperatingSystemHW1\$ cut -d':' -f1 /etc/passwd
root:
daemon:
bin:
sys:
sync:
games:
man:
lp:
mail:
news:
uucp:
proxy:
www-data:
backup:
list:
irc:
gnats:
nobody:
systemd-timesync:
systemd-network:
systemd-resolve:
systemd-bus-proxy:
syslog:
_apt:
messagebus:
uuid:
lightdm:
whoopsie:
avahi-autopid:
avahi:
dnsmasq:
colord:
speech-dispatcher:
hplip:
kernoops:
pulse:
rtkit:
saned:
usbmux:
parallels:

126) prints 2nd and 3rd element of an array which is splitted by delimiter of every row, putting delimiter di separate elements



```

parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -d':' -f2,4 /etc/passwd
x:0
x:1
x:2
x:3
x:65534
x:60
x:12
x:7
x:8
x:9
x:10
x:13
x:33
x:34
x:38
x:39
x:41
x:65534
x:102
x:103
x:104
x:105
x:108
x:65534
x:110
x:111
x:114
x:116
x:119
x:120
x:65534
x:123
x:29
x:7
x:65534
x:124
x:126
x:127
x:46
x:1000

```

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127) copy file /etc/passwd to current directory with filename as password

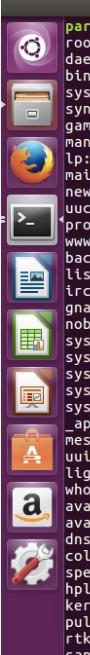


```

parallels@ubuntu:~/OS/OperatingSystemHW1$ cp /etc/passwd password
parallels@ubuntu:~/OS/OperatingSystemHW1$ ls
alices_file    cfiles.sh    fact.sh    file_oper.c    len.sh    OS_HOME_ASSIGNMENT_1.pdf    sample.sh          Tolqinjon
array.sh       copy.sh      fcount.sh   flist.sh     maxlist.sh  password        select.sh         Ulugbek
Assignment.md  crypto_file  file       fsort.sh    max.sh      proc_invok.sh
case.sh        core4info   file_oper   HW1.docx   names      README.md
core4info      file_oper
parallels@ubuntu:~/OS/OperatingSystemHW1$ 

```

128) prints content of password file

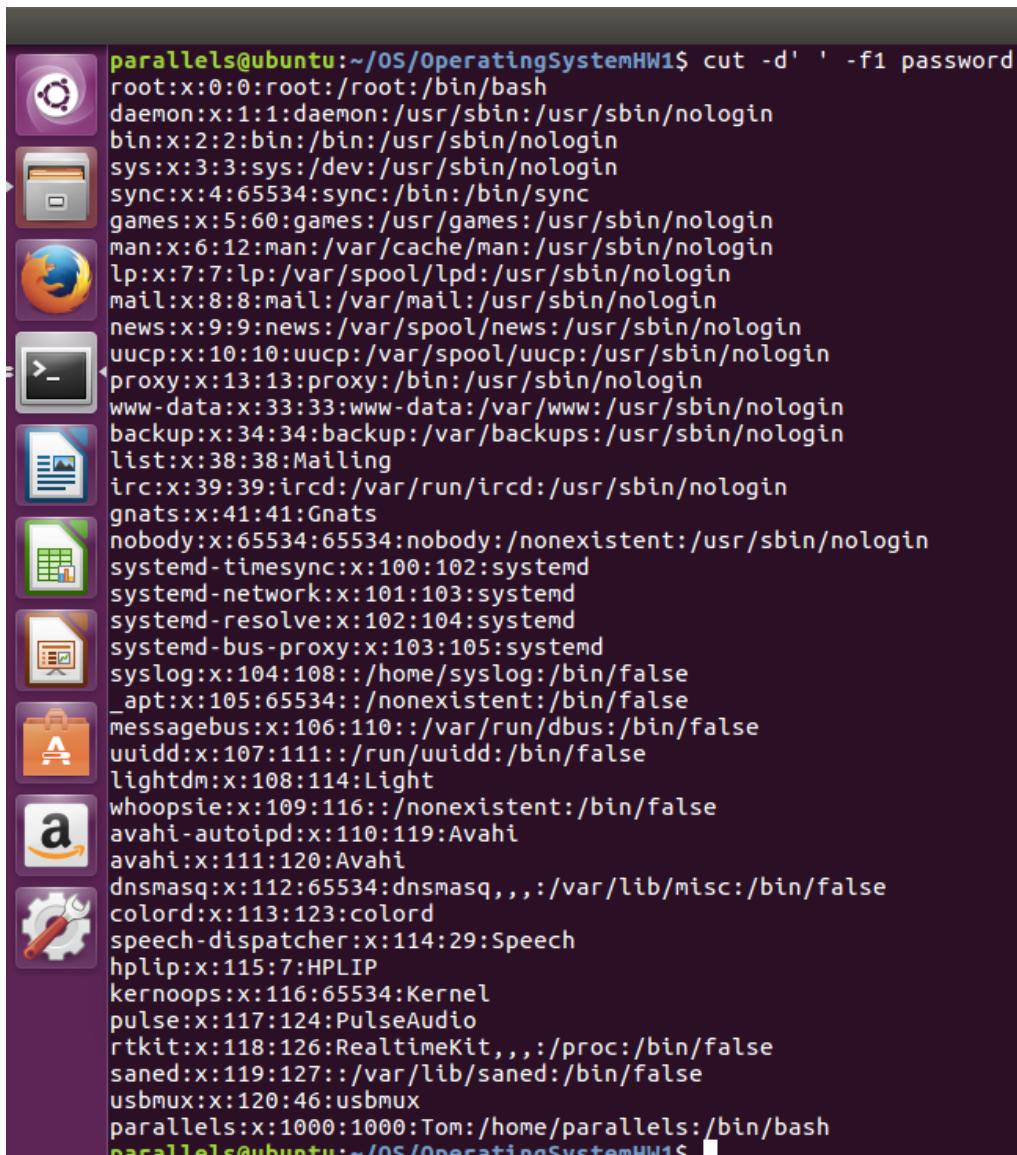


```

parallels@ubuntu:~/OS/OperatingSystemHW1$ cat password
root:x:0:root:/root:/bin/bash
daemon:x:1:daemon:/usr/sbin/nologin
bin:x:2:bin:/bin:/nologin
sys:x:3:sys:/dev:/nologin
sync:x:4:65534:sync:/bin:/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-timesync:x:100:102:systemd Time Synchronization,,,:/run/systemd:/bin/false
systemd-network:x:101:103:systemd Network Management,,,:/run/systemd/netif:/bin/false
systemd-resolve,x:102:104:systemd Resolver,,,:/run/systemd/resolve:/bin/false
systemd-bus-proxy,x:103:105:systemd Bus Proxy,,,:/run/systemd:/bin/false
syslog:x:104:108::/home/syslog:/bin/false
_apt:x:105:65534:/:/nonexistent:/bin/false
Messagebus,x:106:110::/var/run/dbus:/bin/false
udidd:x:107:111::/run/udidd:/bin/false
lightdm:x:108:114:Light Display Manager:/var/lib/lightdm:/bin/false
whoopsie,x:109:116::/nonexistent:/bin/false
avahi-autopid,x:110:119:avahi autopid daemon,,,:/var/lib/avahi-autopid:/bin/false
avahi,x:111:120:avahi mDNS daemon,,,:/var/run/avahi-daemon:/bin/false
dnsmasq,x:112:65534:dnsmasq,,,:/var/lib/misc:/bin/false
colord,x:113:123:colord colour management daemon,,,:/var/lib/colord:/bin/false
speech-dispatcher,x:114:29:Speech Dispatcher,,,:/var/run/speech-dispatcher:/bin/false
hplip,x:115:7:HPLIP system user,,,:/var/run/hplip:/bin/false
kernoops,x:116:65534:KernelOops Tracking Daemon,,,:/bin/false
pulse,x:117:124:PulseAudio daemon,,,:/var/run/pulse:/bin/false
rtkit,x:118:126:RealtimeKit,,,:/proc:/bin/false
saned,x:119:127::/var/lib/saned:/bin/false
usbmux,x:120:46:usbmux daemon,,,:/var/lib/usbmux:/bin/false
parallels,x:1000:1000:Tom:/home/parallels:/bin/bash

```

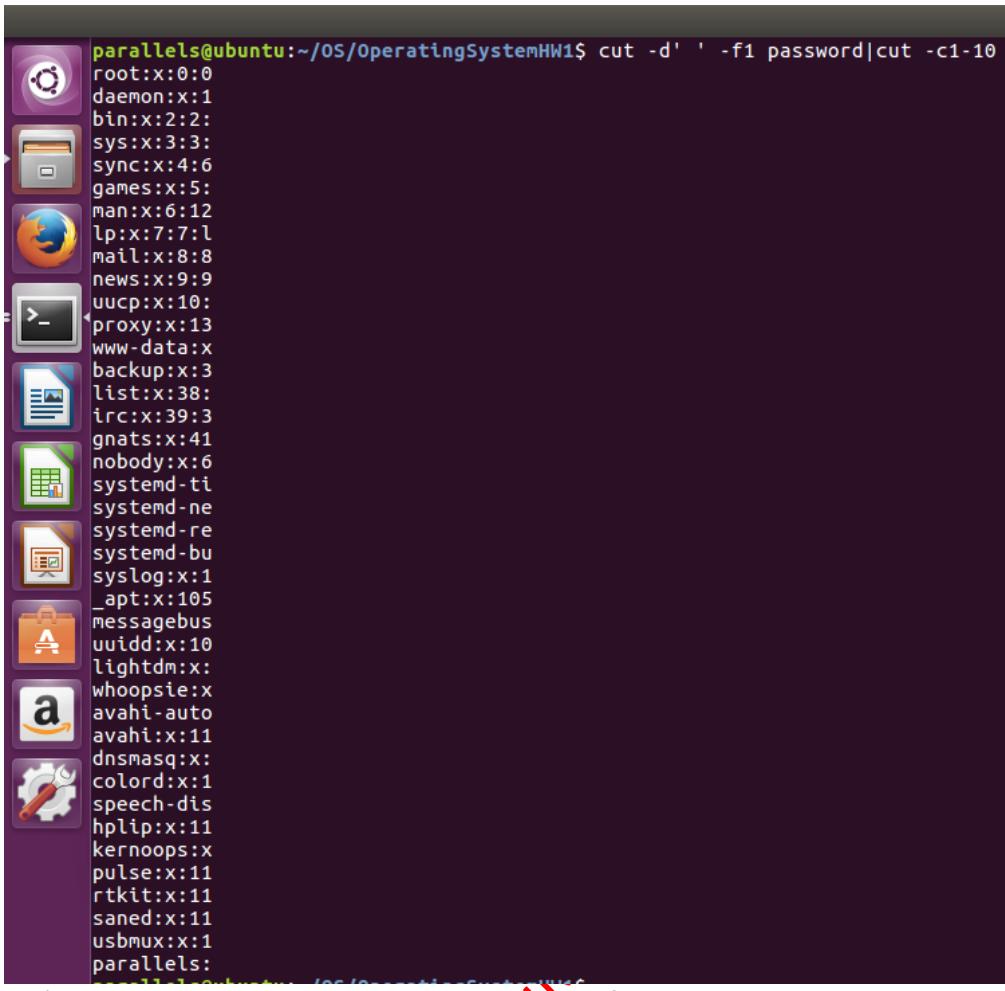
129) should print 1st element of an array splitting by delimiter, but as there is no delimiter '' , it prints the whole content



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -d' ' -f1 password
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-timesync:x:100:102:systemd
systemd-network:x:101:103:systemd
systemd-resolve:x:102:104:systemd
systemd-bus-proxy:x:103:105:systemd
syslog:x:104:108::/home/syslog:/bin/false
_apt:x:105:65534::/nonexistent:/bin/false
messagebus:x:106:110::/var/run/dbus:/bin/false
uuidd:x:107:111::/run/uuidd:/bin/false
lightdm:x:108:114:Light
whoopsie:x:109:116::/nonexistent:/bin/false
avahi-autoipd:x:110:119:Avahi
avahi:x:111:120:Avahi
dnsmasq:x:112:65534:dnsmasq,,,:/var/lib/misc:/bin/false
colord:x:113:123:colord
speech-dispatcher:x:114:29:Speech
hplip:x:115:7:HPLIP
kernoops:x:116:65534:Kernel
pulse:x:117:124:PulseAudio
rtkit:x:118:126:RealtimeKit,,,:/proc:/bin/false
saned:x:119:127::/var/lib/saned:/bin/false
usbmux:x:120:46:usbmux
parallels:x:1000:1000:Tom:/home/parallels:/bin/bash
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

130) as delimiter '' it takes every row and prints characters from 1st to 10th

SOC 3010-OS



A screenshot of a Ubuntu desktop environment. On the left, there's a vertical dock with various icons: Home, Dash, Applications, Places, System, Help, and others. The main window is a terminal with the command `cut -d' ' -f1 password|cut -c1-10` running. The output shows a list of users and their home directories:

```
parallels@ubuntu:~/OS/OperatingSystemHW1$ cut -d' ' -f1 password|cut -c1-10
root:x:0:0
daemon:x:1
bin:x:2:2
sys:x:3:3
sync:x:4:6
games:x:5:
man:x:6:12
lp:x:7:7:l
mail:x:8:8
news:x:9:9
uucp:x:10:
proxy:x:13
www-data:x
backup:x:3
list:x:38:
irc:x:39:3
gnats:x:41
nobody:x:6
systemd-ti
systemd-ne
systemd-re
systemd-bu
syslog:x:1
_apt:x:105
messagebus
uuid:x:10
lightdm:x:
whoopsie:x
avahi-auto
avahi:x:11
dnsmasq:x:
colord:x:1
speech-dis
hplip:x:11
kernoops:x
pulse:x:11
rtkit:x:11
saned:x:11
usbmux:x:1
parallels:
```

On the right side of the screen, there is a red diagonal watermark that reads "Y FALL 2017".

131) it revers the content and shows 1st element of an array which is spleetted by delimiter

A vertical column of 24 small icons representing various applications and system components, typical of a Linux desktop environment.

```
parallels@ubuntu:~/OS/OperatingSystemHW1$ rev password | cut -d' ' -f1
hsab/nib/:toor/:toor:0:0:x:toor
nigolon/nibs/rsu/:nibs/rsu/:namead:1:1:x:namead
nigolon/nibs/rsu/:nib/:nib:2:2:x:nib
nigolon/nibs/rsu/:ved/:sys:3:3:x:sys
cnys/nib/:nib/:cnys:4:4:x:cnys
nigolon/nibs/rsu/:semag/rsu/:semag:6:5:x:semag
nigolon/nibs/rsu/:nam/ehcac/rav/:nam:21:6:x:nam
nigolon/nibs/rsu/:dpl/loops/rav/:pl:7:7:x:pl
nigolon/nibs/rsu/:liam/rav/:liam:8:8:x:liam
nigolon/nibs/rsu/:swen/loops/rav/:swen:9:9:x:swen
nigolon/nibs/rsu/:pcuu/loops/rav/:pcuu:01:01:x:pcuu
nigolon/nibs/rsu/:nib/:yxorp:31:31:x:yxorp
nigolon/nibs/rsu/:www/rav/:atad-www:33:33:x:atad-www
nigolon/nibs/rsu/:spukcab/rav/:pukcab:43:43:x:pukcab
nigolon/nibs/rsu/:tsil/rav/:reganaM
nigolon/nibs/rsu/:dcrit/nur/rav/:dcrit:93:93:x:cri
nigolon/nibs/rsu/:stang/bil/rav/:)ninda(
nigolon/nibs/rsu/:tnetsixenon/:ydobon:43556:43556:x:ydobon
eslaf/nib/:dmetsys/nur/:,,,noitazinorhcnyS
eslaf/nib/:fiten/dmetsys/nur/:,,,tnemeganaM
eslaf/nib/:evloser/dmetsys/nur/:,,,revloseR
eslaf/nib/:dmetsys/nur/:,,,yxorp
eslaf/nib/:golsys/emoh/:801:401:x:golsys
eslaf/nib/:tnetsixenon/:43556:501:x:tpa_
eslaf/nib/:subd/nur/rav/:011:601:x:subegassem
eslaf/nib/:ddiuu/nur/:111:701:x:ddiuu
eslaf/nib/:mdthgil/bil/rav/:reganaM
eslaf/nib/:tnetsixenon/:611:901:x:eispoohw
eslaf/nib/:dpiotua-ihava/bil/rav/:,,,namead
eslaf/nib/:namead-ihava/nur/rav/:,,,namead
eslaf/nib/:csim/bil/rav/:,,,qsamsnd:43556:211:x:qsamsnd
eslaf/nib/:droloc/bil/rav/:,,,namead
eslaf/nib/:rehctapsid-hceeps/nur/rav/:,,,rehctapsid
eslaf/nib/:pilph/nur/rav/:,,,resu
eslaf/nib/:,,,namead
eslaf/nib/:eslup/nur/rav/:,,,namead
eslaf/nib/:corp:,,,tiKemitlaeR:621:811:x:tiktr
eslaf/nib/:denas/bil/rav/:721:911:x:denas
eslaf/nib/:xumbsu/bil/rav/:,,,namead
hsab/nib/:slellarap/emoh/:mot:0001:0001:x:slellarap
```

132) prints characters from 10th till 50th character of reverse content of file

SOC 3010-OS HOME

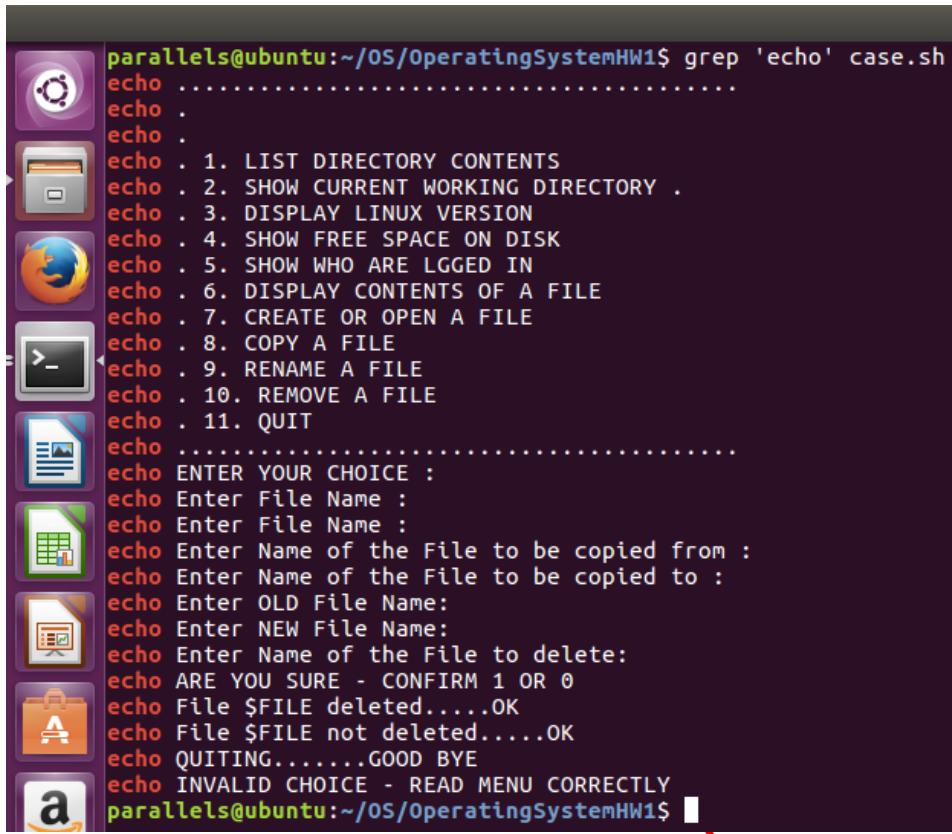
ALL 2017

```
parallels@ubuntu:~/OS/OperatingSystemHW1$ rev password | cut -d' ' -f1| cut -c10-50
:toor:/toor:0:0:x:toor
ibs/rsu/:nibs/rsu/:namead:1:1:x:namead
ibs/rsu/:nib/:nib:2:2:x:nib
ibs/rsu/:ved/:sys:3:3:x:sys
:nib:/cnys:43556:4:x:cnys
ibs/rsu/:semag/rsu/:semag:06:5:x:semag
ibs/rsu/:nam/ehcac/rav/:nam:21:6:x:nam
ibs/rsu/:dpl/loops/rav/:pl:7:7:x:pl
ibs/rsu/:liam/rav/:liam:8:8:x:liam
ibs/rsu/:swen/loops/rav/:swen:9:9:x:swen
ibs/rsu/:pcuu/loops/rav/:pcuu:01:01:x:pcu
ibs/rsu/:nib/:yxorp:31:31:x:yxorp
ibs/rsu/:www/rav/:atad-www:33:33:x:atad-w
ibs/rsu/:spukcab/rav/:pukcab:43:43:x:pukc
ibs/rsu/:tsil/rav/:reganaM
ibs/rsu/:dcrit/nur/rav/:dcrit:93:93:x:cri
ibs/rsu/:stang/bil/rav/:nima(
ibs/rsu/:tnetsixenon/:ydobon:43556:43556:
/:dmetsys/nur/:,,,noitazinorhcnyS
/:fiten/dmetsys/nur/:,,,tnemeganaM
/:evloser/dmetsys/nur/:,,,revloseR
/:dmetsys/nur/:,,,yxorp
/:golsys/emoh/:801:401:x:golsys
/:tnetsixenon/:43556:501:x:tpa_
/:subd/nur/rav/:011:601:x:subegassem
/:ddiuu/nur/:111:701:x:ddiuu
/:mdthgil/bil/rav/:reganaM
/:tnetsixenon/:611:901:x:eispoohw
/:driotua-ihava/bil/rav/:,,,namead
/:namead-ihava/nur/rav/:,,,namead
/:csim/bil/rav/:,,,qsamsnd:43556:211:x:qs
/:droloc/bil/rav/:,,,namead
/:rehctapsid-hceeps/nur/rav/:,,,rehctapsi
/:pilph/nur/rav/:,,,resu
/:,:,namead
/:eslup/nur/rav/:,,,namead
/:corp/:,,,tiKemitlaeR:621:811:x:tiktr
/:denas/bil/rav/:721:911:x:denas
/:xumsbu/bil/rav/:,,,namead
:stellarap/emoh/:mot:0001:0001:x:sstellara
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

133) prints the lines where it contains word CHOICE in select.sh file

```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep 'CHOICE' select.sh
select CHOICE in $OPTIONS
if [ $CHOICE == ls ]
elif [ $CHOICE == longls ]
elif [ $CHOICE == who ]
elif [ $CHOICE == free ]
elif [ $CHOICE == linuxversion ]
elif [ $CHOICE == cat ]
elif [ $CHOICE == mv ]
elif [ $CHOICE == cp ]
elif [ $CHOICE == QUIT ]
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

134) prints the lines where it contains word 'echo' in case.sh file



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep 'echo' case.sh
echo .....
echo .
echo .
echo . 1. LIST DIRECTORY CONTENTS
echo . 2. SHOW CURRENT WORKING DIRECTORY .
echo . 3. DISPLAY LINUX VERSION
echo . 4. SHOW FREE SPACE ON DISK
echo . 5. SHOW WHO ARE LOGGED IN
echo . 6. DISPLAY CONTENTS OF A FILE
echo . 7. CREATE OR OPEN A FILE
echo . 8. COPY A FILE
echo . 9. RENAME A FILE
echo . 10. REMOVE A FILE
echo . 11. QUIT
echo .....
echo ENTER YOUR CHOICE :
echo Enter File Name :
echo Enter File Name :
echo Enter Name of the File to be copied from :
echo Enter Name of the File to be copied to :
echo Enter OLD File Name:
echo Enter NEW File Name:
echo Enter Name of the File to delete:
echo ARE YOU SURE - CONFIRM 1 OR 0
echo File $FILE deleted.....OK
echo File $FILE not deleted.....OK
echo QUITING.....GOOD BYE
echo INVALID CHOICE - READ MENU CORRECTLY
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

135) prints every new line which starts with small letters (it is given as regex) in file

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```

parallels@ubuntu:~/OS/OperatingSystemHW1$ grep '^[a-z]' select.sh
select CHOICE in $OPTIONS
do
if [ $CHOICE == ls ]
then
ls
elif [ $CHOICE == longls ]
then
ls -la
elif [ $CHOICE == who ]
then
who -a
elif [ $CHOICE == free ]
then
free
elif [ $CHOICE == linuxversion ]
then
uname -a
elif [ $CHOICE == cat ]
then
echo ENTER FILE NAME :
read FILE
cat $FILE
elif [ $CHOICE == mv ]
then
echo ENTER OLD FILE NAME :
read FILE1
echo ENTER NEW FILE NAME :
read FILE2
mv $FILE1 $FILE2
elif [ $CHOICE == cp ]
then
echo ENTER NAME OF FILE TO BE COPIED FROM:
read FILE1
echo ENTER NAME OF FILE TO BE COPIED TO :
read FILE2
cp $FILE1 $FILE2
elif [ $CHOICE == QUIT ]
then
echo BYE ... BYE
break
fi
done

```

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136) prints every new line which starts with capital letters (as given in regex) in file



```

parallels@ubuntu:~/OS/OperatingSystemHW1$ grep '^[A-Z]' select.sh
OPTIONS='ls longls who free linuxversion cat mv cp QUIT'
PS3='Choose an option:'
parallels@ubuntu:~/OS/OperatingSystemHW1$ 

```

137) prints every new line which starts numbers (as given in regex) in file



```

parallels@ubuntu:~/OS/OperatingSystemHW1$ grep '^[0-9]' select.sh
parallels@ubuntu:~/OS/OperatingSystemHW1$ 

```

138) prints every new line which starts with space '' in file



```

parallels@ubuntu:~/OS/OperatingSystemHW1$ grep '^[' ']'' select.sh
parallels@ubuntu:~/OS/OperatingSystemHW1$ 

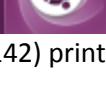
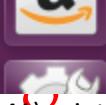
```

139) reads every file recursively and find line exact matches with given string 'esac', then prints filename and line



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -r -x 'esac' *
case.sh:esac
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

140) prints files which does not contain string 'esac' in current directory



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -L 'esac' *
alices_file
array.sh
Assignment.md
cfiles.sh
copy.sh
copyto_file
core4info
fact.sh
fcount.sh
file
file_oper
file_oper.c
flist.sh
fsort.sh
HW1.docx
len.sh
maxlist.sh
max.sh
names
OS_HOME_ASSIGNMENT_1.pdf
password
proc_invok.sh
README.md
sample.sh
select.sh
some_another_file
sumodd.sh
Tolqinjon
Ulugbek
var.sh
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

141) prints files which contains the string 'file' in current directory



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -l 'esac' *
case.sh
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

142) prints files and lines which matches with string 'esac'



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -o 'esac' *
case.sh:esac
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

143) print files with any name with any extension and lines which matches with string 'esac'



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -o 'esac' *.*
case.sh:esac
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

144) prints files with any name with any extension and lines which matches with string 'case' 2



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -o 'case' *.*
case.sh:case
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

145) prints files with any name with any extension and lines with line number which matches with string 'case' REF



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -n 'case' *.*
case.sh:36:case $CH in
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

146) prints only matched lines with string 'case' in case.sh file

147) prints line number and matched line with string 'esac' in case.sh file

148) prints line number and matched line with string 'case' in case.sh file

149) prints line which matched with string 'case' in case.sh file

150) prints line which matched with string 'echo' in case.sh file



```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -o 'esac' case.sh
esac
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -n 'esac' case.sh
95:esac
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -n 'case' case.sh
36:case $CH in
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -o 'case' case.sh
case
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -o 'echo' case.sh
echo
echo
echo
```

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- 151) 1st it takes echo matched lines and prints count of lines
- 152) prints byte offset of matched string 'case' in file case.sh
- 153) prints only matched results with line number and byte offset in file case.sh
- 154) prints byte offset, line number with full line which matched with string 'case'
- 155) prints byte offset for every match

```

parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -o 'echo' case.sh | wc -l
28
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -o -b 'case' case.sh
595:case
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -o -b -n 'case' case.sh
36:595:case
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -b -n 'case' case.sh
36:595:case $CH in
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -b 'echo' case.sh
94:echo .....
141:echo :
155:echo :
164:echo . 1. LIST DIRECTORY CONTENTS
200:echo . 2. SHOW CURRENT WORKING DIRECTORY .
243:echo . 3. DISPLAY LINUX VERSION
277:echo . 4. SHOW FREE SPACE ON DISK
313:echo . 5. SHOW WHO ARE LOGGED IN
347:echo . 6. DISPLAY CONTENTS OF A FILE
386:echo . 7. CREATE OR OPEN A FILE
420:echo . 8. COPY A FILE
444:echo . 9. RENAME A FILE
470:echo . 10. REMOVE A FILE
497:echo . 11. QUIT
515:echo .....
562:echo ENTER YOUR CHOICE :
667:echo Enter File Name :
716:echo Enter File Name :
767:echo Enter Name of the File to be copied from :
826:echo Enter Name of the File to be copied to :
906:echo Enter OLD File Name:
943:echo Enter NEW File Name:
1004:echo Enter Name of the File to delete:
1053:echo ARE YOU SURE - CONFIRM 1 OR 0
1127:echo File $FILE deleted.....OK
1163:echo File $FILE not deleted.....OK
1208:echo QUITING.....GOOD BYE
1248:echo INVALID CHOICE - READ MENU CORRECTLY
parallels@ubuntu:~/OS/OperatingSystemHW1$ 
```

- 156) prints only matches with byte offset and line number in file case.sh

SOC

```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -o -b -n 'echo' case.sh
6:94:echo
7:141:echo
10:155:echo
12:164:echo
14:200:echo
15:243:echo
17:277:echo
19:313:echo
21:347:echo
23:386:echo
25:420:echo
27:444:echo
29:470:echo
31:497:echo
33:515:echo
34:562:echo
52:667:echo
57:716:echo
62:767:echo
64:826:echo
69:906:echo
71:943:echo
76:1004:echo
78:1053:echo
83:1127:echo
85:1163:echo
89:1208:echo
93:1248:echo
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

157) prints byteoffset, line number of matched string with full line

```

parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -b -n 'echo' case.sh
Search your computer ..... .
10:155:echo .
12:164:echo . 1. LIST DIRECTORY CONTENTS
14:200:echo . 2. SHOW CURRENT WORKING DIRECTORY .
15:243:echo . 3. DISPLAY LINUX VERSION
17:277:echo . 4. SHOW FREE SPACE ON DISK
19:313:echo . 5. SHOW WHO ARE LOGGED IN
21:347:echo . 6. DISPLAY CONTENTS OF A FILE
23:386:echo . 7. CREATE OR OPEN A FILE
25:420:echo . 8. COPY A FILE
27:444:echo . 9. RENAME A FILE
29:470:echo . 10. REMOVE A FILE
31:497:echo . 11. QUIT
33:515:echo .....
34:562:echo ENTER YOUR CHOICE :
52:667:echo Enter File Name :
57:716:echo Enter File Name :
62:767:echo Enter Name of the File to be copied from :
64:826:echo Enter Name of the File to be copied to :
69:906:echo Enter OLD File Name:
71:943:echo Enter NEW File Name:
76:1004:echo Enter Name of the File to delete:
78:1053:echo ARE YOU SURE - CONFIRM 1 OR 0
83:1127:echo File $FILE deleted.....OK
85:1163:echo File $FILE not deleted.....OK
89:1208:echo QUITING.....GOOD BYE
93:1248:echo INVALID CHOICE - READ MENU CORRECTLY
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

158) prints byte offset of matched string

```

parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -b 'echo' case.sh
94:echo .....
141:echo .
155:echo .
164:echo . 1. LIST DIRECTORY CONTENTS
200:echo . 2. SHOW CURRENT WORKING DIRECTORY .
243:echo . 3. DISPLAY LINUX VERSION
277:echo . 4. SHOW FREE SPACE ON DISK
313:echo . 5. SHOW WHO ARE LOGGED IN
347:echo . 6. DISPLAY CONTENTS OF A FILE
386:echo . 7. CREATE OR OPEN A FILE
420:echo . 8. COPY A FILE
444:echo . 9. RENAME A FILE
470:echo . 10. REMOVE A FILE
497:echo . 11. QUIT
LibreOffice Writer .....
502:echo ENTER YOUR CHOICE :
667:echo Enter File Name :
716:echo Enter File Name :
767:echo Enter Name of the File to be copied from :
826:echo Enter Name of the File to be copied to :
906:echo Enter OLD File Name:
943:echo Enter NEW File Name:
1004:echo Enter Name of the File to delete:
1053:echo ARE YOU SURE - CONFIRM 1 OR 0
1127:echo File $FILE deleted.....OK
1163:echo File $FILE not deleted.....OK
1208:echo QUITING.....GOOD BYE
1248:echo INVALID CHOICE - READ MENU CORRECTLY
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

159) prints matched string line and line number

A vertical column of ten small icons representing various Linux applications and system components, such as the terminal, file manager, and system settings.

```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -n 'echo' case.sh
6:echo .....
7:echo .
10:echo .
12:echo . 1. LIST DIRECTORY CONTENTS
14:echo . 2. SHOW CURRENT WORKING DIRECTORY .
15:echo . 3. DISPLAY LINUX VERSION
17:echo . 4. SHOW FREE SPACE ON DISK
19:echo . 5. SHOW WHO ARE LOGGED IN
21:echo . 6. DISPLAY CONTENTS OF A FILE
23:echo . 7. CREATE OR OPEN A FILE
25:echo . 8. COPY A FILE
27:echo . 9. RENAME A FILE
29:echo . 10. REMOVE A FILE
31:echo . 11. QUIT
33:echo .....
34:echo ENTER YOUR CHOICE :
52:echo Enter File Name :
57:echo Enter File Name :
62:echo Enter Name of the File to be copied from :
64:echo Enter Name of the File to be copied to :
69:echo Enter OLD File Name:
71:echo Enter NEW File Name:
76:echo Enter Name of the File to delete:
78:echo ARE YOU SURE - CONFIRM 1 OR 0
83:echo File $FILE deleted.....OK
85:echo File $FILE not deleted.....OK
89:echo QUITING.....GOOD BYE
93:echo INVALID CHOICE - READ MENU CORRECTLY
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

160) prints lines which starts with 'case' string in case.sh file

A vertical column of ten small icons representing various Linux applications and system components, such as the terminal, file manager, and system settings.

```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep '^case' case.sh
case $CH in
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

161) prints lines which ends with string 'OK' in case.sh file

162) prints lines which ends with string 'ne' in case.sh file

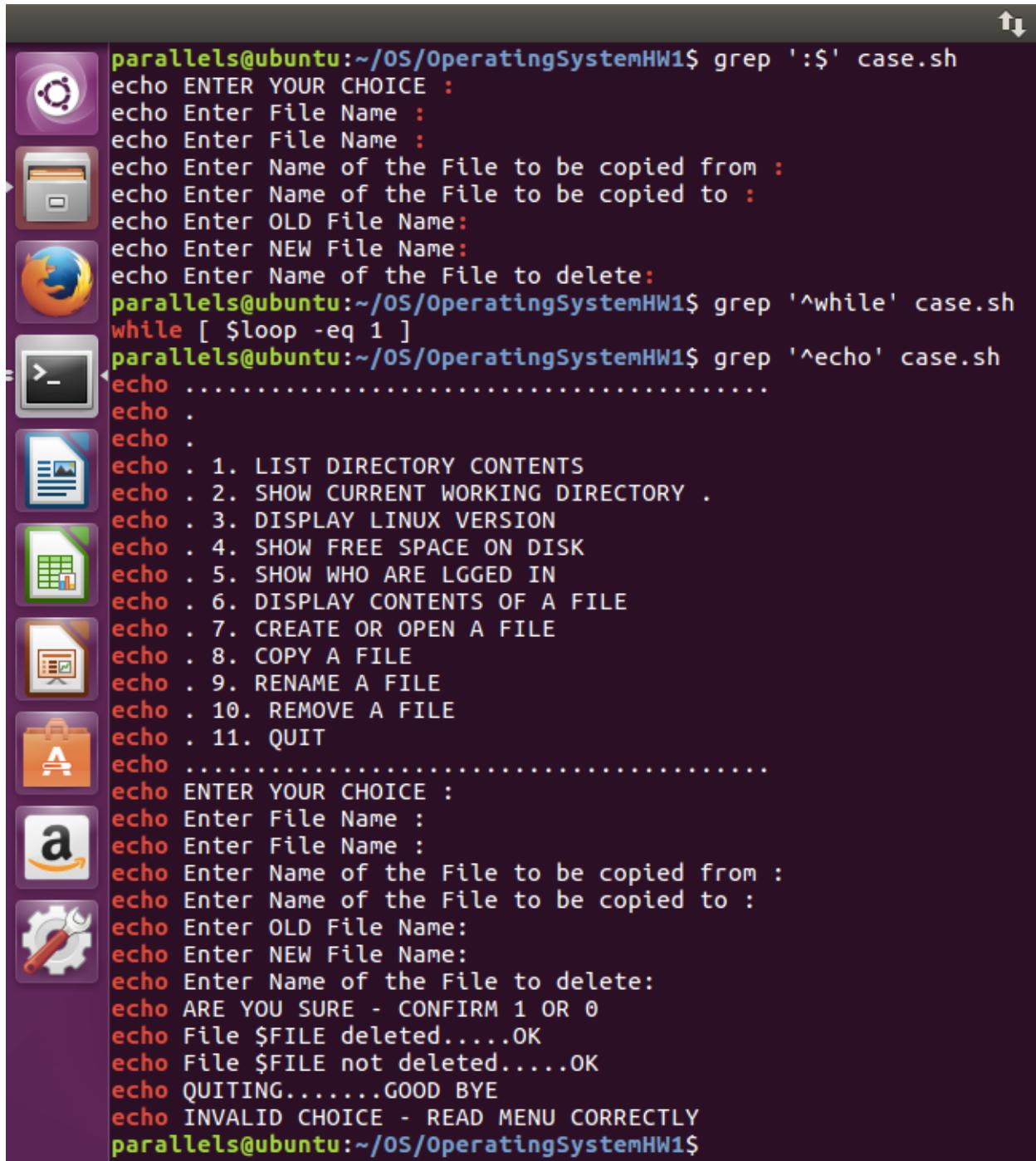
A vertical column of ten small icons representing various Linux applications and system components, such as the terminal, file manager, and system settings.

```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep 'OK$' case.sh
read OK
echo File $FILE deleted.....OK
echo File $FILE not deleted.....OK
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep 'ne$' case.sh
done
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

163) prints lines which ends with character '!' in case.sh file

164) prints lines which starts with 'while' string in case.sh file

165) prints lines which starts with 'echo' string in case.sh file

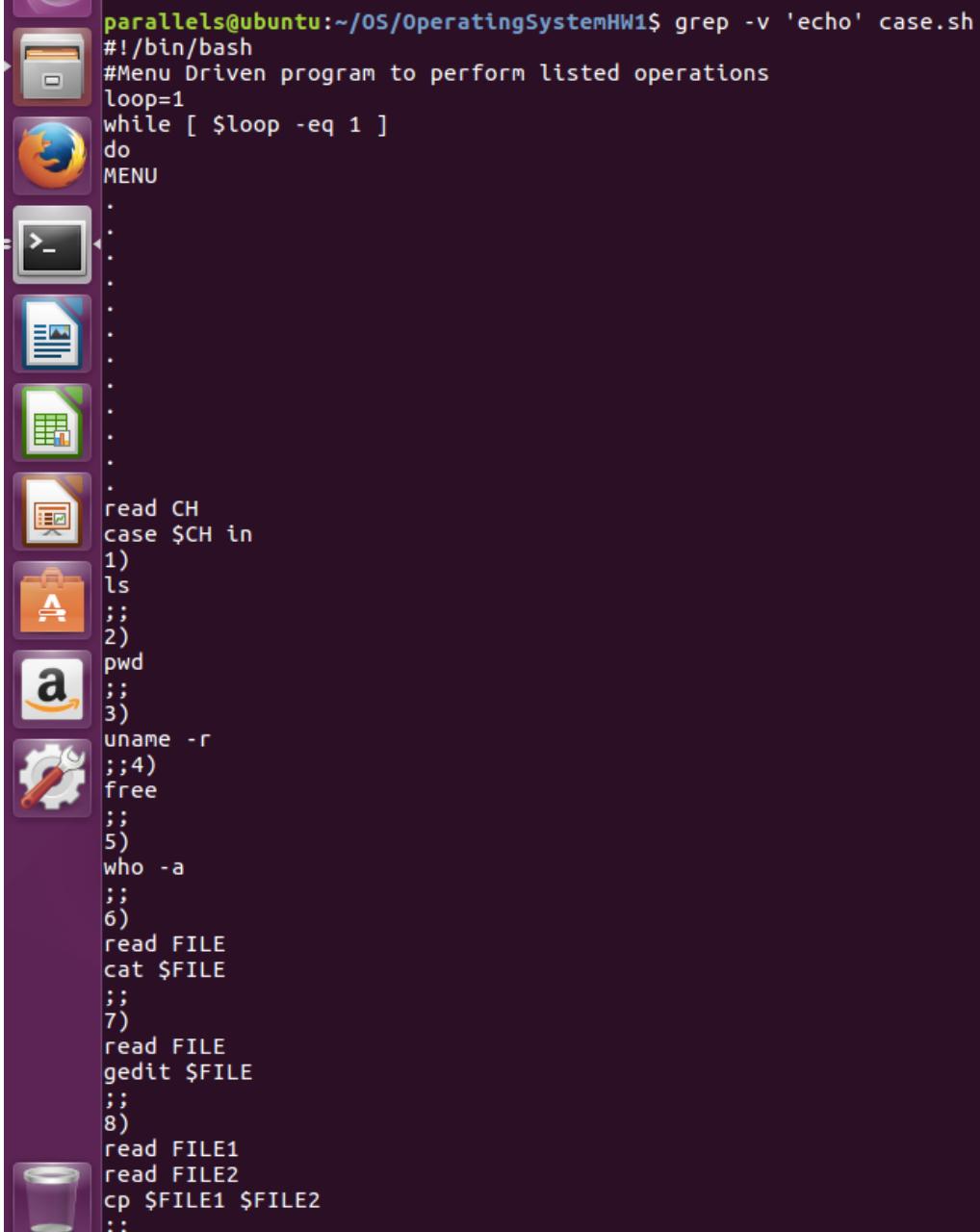


The image shows a terminal window on an Ubuntu desktop. The terminal displays a script named case.sh. The script prompts the user for various file operations, such as copying, deleting, and renaming files. It also includes a menu with 11 options ranging from listing directory contents to quitting. The terminal window has a dark background with light-colored text. To the left of the terminal, there is a vertical column of icons representing different file types and operations.

```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep ':$' case.sh
echo ENTER YOUR CHOICE :
echo Enter File Name :
echo Enter File Name :
echo Enter Name of the File to be copied from :
echo Enter Name of the File to be copied to :
echo Enter OLD File Name:
echo Enter NEW File Name:
echo Enter Name of the File to delete:
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep '^while' case.sh
while [ $loop -eq 1 ]
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep '^echo' case.sh
echo .....
echo .
echo .
echo . 1. LIST DIRECTORY CONTENTS
echo . 2. SHOW CURRENT WORKING DIRECTORY .
echo . 3. DISPLAY LINUX VERSION
echo . 4. SHOW FREE SPACE ON DISK
echo . 5. SHOW WHO ARE LOGGED IN
echo . 6. DISPLAY CONTENTS OF A FILE
echo . 7. CREATE OR OPEN A FILE
echo . 8. COPY A FILE
echo . 9. RENAME A FILE
echo . 10. REMOVE A FILE
echo . 11. QUIT
echo .....
echo ENTER YOUR CHOICE :
echo Enter File Name :
echo Enter File Name :
echo Enter Name of the File to be copied from :
echo Enter Name of the File to be copied to :
echo Enter OLD File Name:
echo Enter NEW File Name:
echo Enter Name of the File to delete:
echo ARE YOU SURE - CONFIRM 1 OR 0
echo File $FILE deleted.....OK
echo File $FILE not deleted.....OK
echo QUITING.....GOOD BYE
echo INVALID CHOICE - READ MENU CORRECTLY
parallels@ubuntu:~/OS/OperatingSystemHW1$
```

166) prints lines which does not match with string 'echo' in case.sh file

SOC

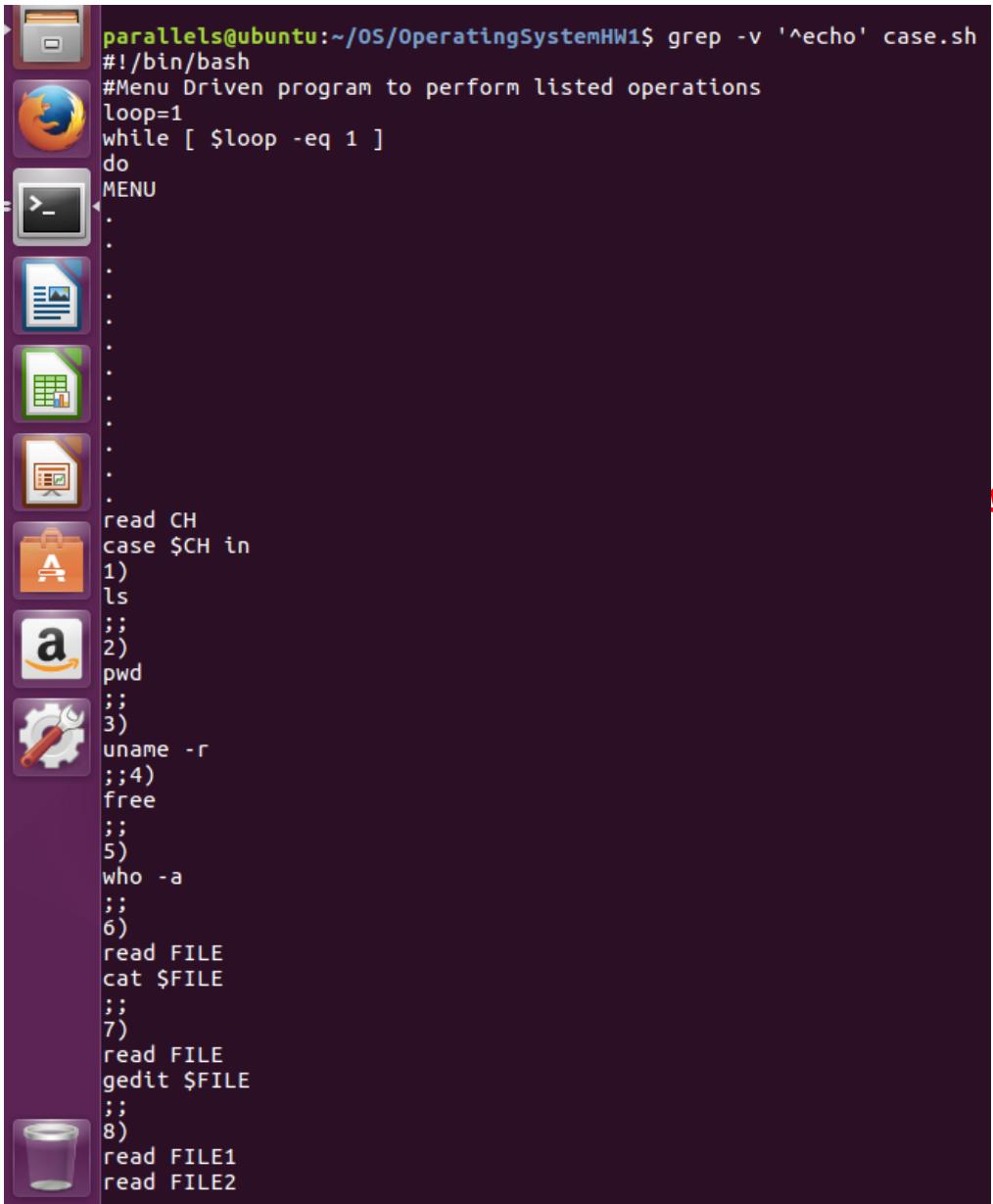


```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -v 'echo' case.sh
#!/bin/bash
#Menu Driven program to perform listed operations
loop=1
while [ $loop -eq 1 ]
do
MENU
.
.
.
.
.
.
.
.
read CH
case $CH in
1)
ls
;;
2)
pwd
;;
3)
uname -r
;;4)
free
;;
5)
who -a
;;
6)
read FILE
cat $FILE
;;
7)
read FILE
gedit $FILE
;;
8)
read FILE1
read FILE2
cp $FILE1 $FILE2
;;
```

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167) prints lines which does not start with string 'echo' in case.sh file

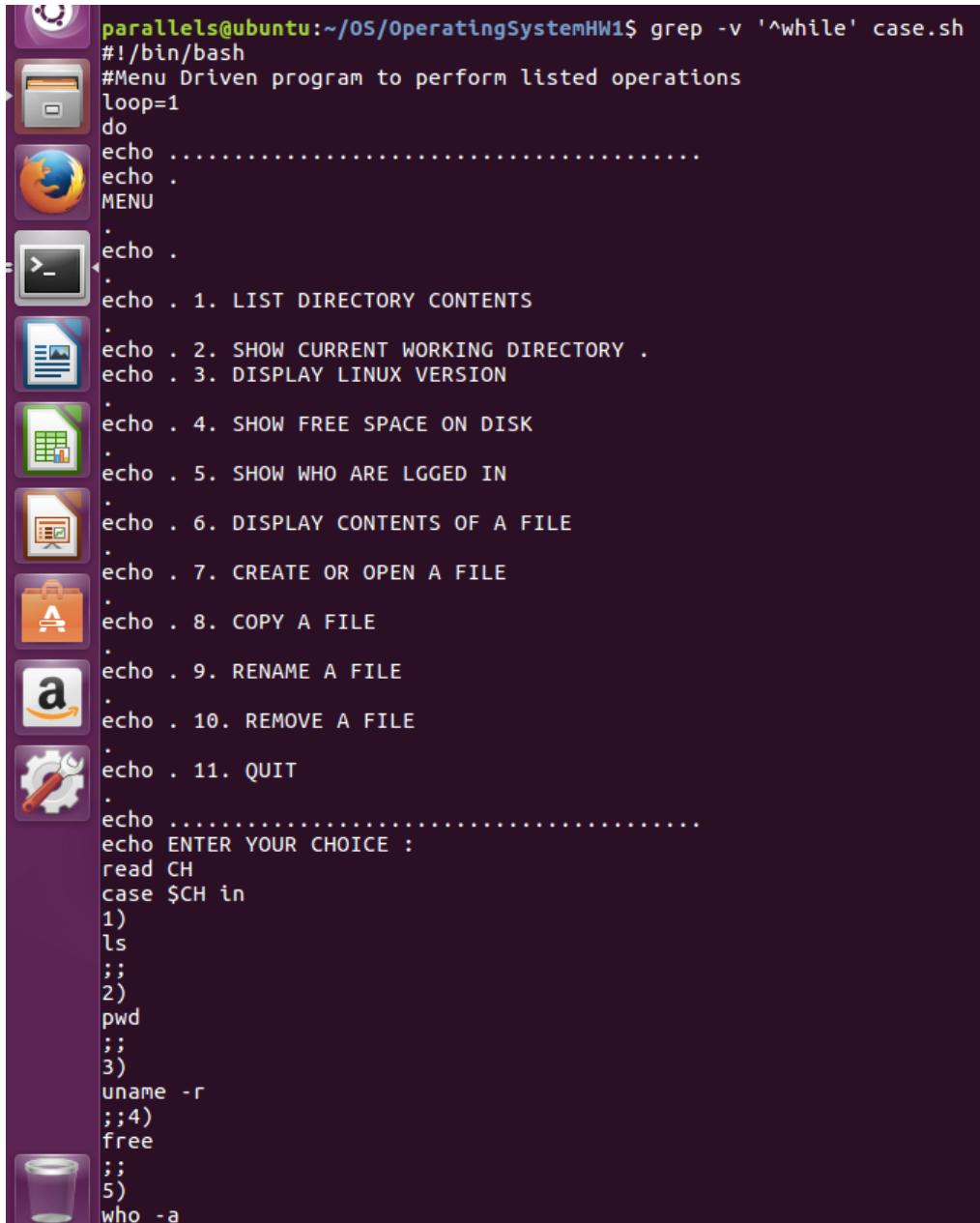
SOC 3010



A screenshot of a Ubuntu desktop environment. On the left, there is a vertical dock containing icons for various applications: Nautilus (file browser), Firefox, Dash (application menu), LibreOffice Writer, LibreOffice Calc, LibreOffice Impress, LibreOffice Draw, Synaptic Package Manager, Amazon Appstore, System Settings, and a trash can. The main window is a terminal window titled 'parallels@ubuntu:~/OS/OperatingSystemHW1\$'. It displays the contents of a file named 'case.sh' which is a menu-driven program. The script uses a 'while' loop to repeatedly prompt the user for input. The 'grep -v' command is used to filter out lines that start with the string 'while'. A red diagonal watermark 'SOC 3010-OS' is visible across the bottom left of the terminal window, and another red watermark 'FALL 2017' is visible on the right side.

```
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -v '^echo' case.sh
#!/bin/bash
#Menu Driven program to perform listed operations
loop=1
while [ $loop -eq 1 ]
do
MENU
.
.
.
.
.
.
.
.
.
.
read CH
case $CH in
1)
ls
;;
2)
pwd
;;
3)
uname -r
;;
4)
free
;;
5)
who -a
;;
6)
read FILE
cat $FILE
;;
7)
read FILE
gedit $FILE
;;
8)
read FILE1
read FILE2
```

168) prints lines which does not start with string 'while' in case.sh file



```

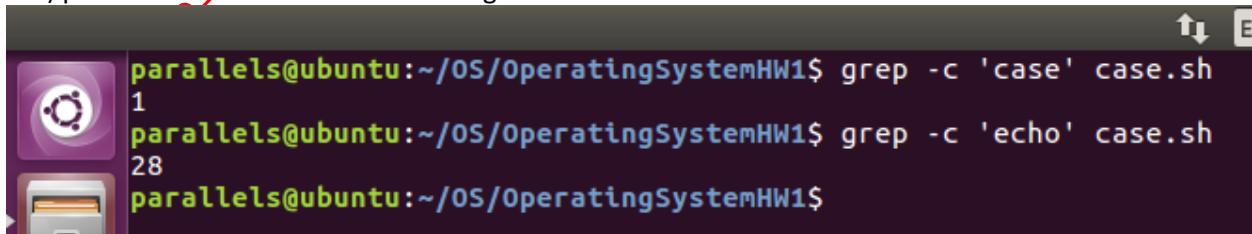
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -v '^while' case.sh
#!/bin/bash
#Menu Driven program to perform listed operations
Loop=1
do
echo .....
echo .
MENU
.
echo .
.
echo . 1. LIST DIRECTORY CONTENTS
.
echo . 2. SHOW CURRENT WORKING DIRECTORY .
echo . 3. DISPLAY LINUX VERSION
.
echo . 4. SHOW FREE SPACE ON DISK
.
echo . 5. SHOW WHO ARE LOGGED IN
.
echo . 6. DISPLAY CONTENTS OF A FILE
.
echo . 7. CREATE OR OPEN A FILE
.
echo . 8. COPY A FILE
.
echo . 9. RENAME A FILE
.
echo . 10. REMOVE A FILE
.
echo . 11. QUIT
.
echo .....
echo ENTER YOUR CHOICE :
read CH
case $CH in
1)
ls
;;
2)
pwd
;;
3)
uname -r
;;
4)
free
;;
5)
who -a

```

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169) prints count of matches 'case' string in case.sh file

170) print count of matches 'echo' string in case.sh file



```

parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -c 'case' case.sh
1
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -c 'echo' case.sh
28
parallels@ubuntu:~/OS/OperatingSystemHW1$

```

171) prints count of matches 'unix' string in file.txt file

172) print lines which matches with string 'read' in case.sh file



```

parallels@ubuntu:~/OS/OperatingSystemHW1$ cat file
I say jump - you say how high.

I don't need your help.parallels@ubuntu:~/OS/OperatingSystemHW1$
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -c 'unix' file
0
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep 'read' case.sh
read CH
read FILE
read FILE
read FILE1
read FILE2
read FILE1
read FILE2
read FILE
read OK
parallels@ubuntu:~/OS/OperatingSystemHW1$ 
```

173) prints only matched with string 'read' as regex in file case.sh

174) prints line counts of matched string 'read' in case.sh



```

parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -ow 'read' case.sh
read
read
read
read
read
read
read
read
read
parallels@ubuntu:~/OS/OperatingSystemHW1$ grep -ow 'read' case.sh | wc -l
9
parallels@ubuntu:~/OS/OperatingSystemHW1$ 
```

175) append next strings which ends with command ~~part2q~~+D to part2q file



```

parallels@ubuntu:~/OS/OperatingSystemHW1$ cat >> part2q
type this text at the console each on speareate lines including this line
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.
parallels@ubuntu:~/OS/OperatingSystemHW1$ 
```

176) prints 3rd line of part2q file

177) prints matched words on 3rd line

178) prints count of matched words on 3rd line

179) prints 1st line of part2q file

180) prints count of matched words on 1st line



```

parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '3p' part2q
outputs generated when these commands are executed. Execute the commands
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '3p' part2q |grep -o 'the'
the
the
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '3p' part2q |grep -o 'the'| wc -l
2
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '1p' part2q
type this text at the console each on speareate lines including this line
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '1p' part2q | grep -o 'the' | wc -l
1
parallels@ubuntu:~/OS/OperatingSystemHW1$ sed -n '1,4p' part2q | grep -o 'the' | wc -l
9
parallels@ubuntu:~/OS/OperatingSystemHW1$ 
```

181) sed --n '1,4p' part2q | grep -o "the" | wc -l - shows how many the word "the" have in first line in file part2q

182) sed 's/the/THE/' part2q - replace "the" to "THE" in each line of file part2q,

```
navruzjn@navruzjn-VirtualBox:~$ sed 's/the/THE/' part2q
type this text at THE console each on separate lines including this line
your PART2 question - State THE Purpose of these commands and Indicate the
outputs generated when THEse commands are executed. Execute the commands
one after anoTHER in the same given order 1) to 200). Clearly explain the
format of THE output with all the fields and their meaning.
Provide all THE screen shots.
```

183) sed 's/THE/the/g' - globally replace "THE" to "the" in file part2q

```
navruzjn@navruzjn-VirtualBox:~$ sed 's/THE/the/g' part2q
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.
```

184) sed 's/the/THE/2' - replace second occurence "the" to "THE" in file part2q

```
navruzjn@navruzjn-VirtualBox:~$ sed 's/the/THE/2' part2q
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of THEse commands and Indicate the
outputs generated when these commands are executed. Execute THE commands
one after another in THE same given order 1) to 200). Clearly explain the
format of the output with all THE fields and their meaning.
Provide all the screen shots.
```

185) sed 's/the/THE/3' - replace third occurrence "the" to "THE" in file part2q

```
navruzjn@navruzjn-VirtualBox:~$ sed 's/the/THE/3' part2q
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of these commands and Indicate THE
outputs generated when these commands are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain THE
format of the output with all the fields and THEir meaning.
Provide all the screen shots.
```

186) sed 's/the/{&}' part2q - replace the first occurrence "the" to "{the}" in each line of file part2q, in another words put "the" into brackets "{}", however it will replace only first occurrence in each line

```
navruzjn@navruzjn-VirtualBox:~$ sed 's/the/{&}' part2q
type this text at {the} console each on separate lines including this line
your PART2 question - State {the} Purpose of these commands and Indicate the
outputs generated when {the}se commands are executed. Execute the commands
one after ano{the}r in the same given order 1) to 200). Clearly explain the
format of {the} output with all the fields and their meaning.
Provide all {the} screen shots.
```

187) sed 's/the/THE/p' part2q - replace "the" to "THE" in each line of file part2q and print every line after original to show changes

```
navruzjn@navruzjn-VirtualBox:~$ sed 's/the/THE/p' part2q
type this text at THE console each on separate lines including this line
type this text at THE console each on separate lines including this line
your PART2 question - State THE Purpose of these commands and Indicate the
your PART2 question - State THE Purpose of these commands and Indicate the
outputs generated when THEse commands are executed. Execute the commands
outputs generated when THEse commands are executed. Execute the commands
one after anoTHER in the same given order 1) to 200). Clearly explain the
one after anoTHER in the same given order 1) to 200). Clearly explain the
format of THE output with all the fields and their meaning.
format of THE output with all the fields and their meaning.
Provide all THE screen shots.
Provide all THE screen shots.
```

188) sed --n 's/the/THE/p' part2q - replace "the" to "THE" in each line of file part2q and print only changed lines after original

navruzjn@navruzjn-VirtualBox:~\$ sed -n 's/the/THE/p' part2q
type this text at THE console each on separate lines including this line
your PART2 question - State THE Purpose of these commands and Indicate the
outputs generated when THEse commands are executed. Execute the commands
one after anoTHER in the same given order 1) to 200). Clearly explain the
format of THE output with all the fields and their meaning.
Provide all THE screen shots.

189) sed 's/the/THE/' part2q | sed 's/commands/instructions/' part2q - replace "the" to "THE" then
"commands" to "instructions" in each line of file part2q, however it will replace only first occurrence in
each line

navruzjn@navruzjn-VirtualBox:~\$ sed 's/the/THE/' part2q | sed 's/commands/instruc
tions/' part2q
type this text at THE console each on separate lines including this line
your PART2 question - State THE Purpose of these instructions and Indicate the
outputs generated when THEse instructions are executed. Execute the commands
one after anoTHER in the same given order 1) to 200). Clearly explain the
format of THE output with all the fields and their meaning.
Provide all THE screen shots.

190) sed -e 's/the/THE/' part2q -e sed 's/commands/instructions/' - add the script to the sed to be
executed, that first replace every first occurrence "the" to "THE" then "commands" to "instructions" in
each line of part2q

navruzjn@navruzjn-VirtualBox:~\$ sed -e 's/THE/the/' -e 's/commands/instructions/
' part2q
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of these instructions and Indicate the
outputs generated when these instructions are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.

191) sed 's/instructions/commands/' - replace every first occurrence in each line of part2q "instructions"
to "commands"

navruzjn@navruzjn-VirtualBox:~\$ sed 's/instructions/commands/' part2q
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.

192) sed '4 s/the/THE/' part2q ~~4~~ replace first occurrence "the" to "THE" in 4th line of file part2q

navruzjn@navruzjn-VirtualBox:~\$ sed '4 s/the/THE/' part2q
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
one after anoTHER in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.

193) sed '1,3 s/the/THE/' part2q ~~3~~ - replace first occurrence "the" to "THE" in 1st and 3rd lines of file
part2q

navruzjn@navruzjn-VirtualBox:~\$ sed '1,3 s/the/THE/' part2q
type this text at THE console each on separate lines including this line
your PART2 question - State THE Purpose of these commands and Indicate the
outputs generated when THEse commands are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.

194) sed '2,\$ s/THE/the/' part2q - replace first occurrence "THE" to "the" in from 2nd line of file part2q

```
navruzjn@navruzjn-VirtualBox:~$ sed '2,$ s/THE/the/' part2q  
type this text at the console each on separate lines including this line  
your PART2 question - State the Purpose of these commands and Indicate the  
outputs generated when these commands are executed. Execute the commands  
one after another in the same given order 1) to 200). Clearly explain the  
format of the output with all the fields and their meaning.  
Provide all the screen shots.
```

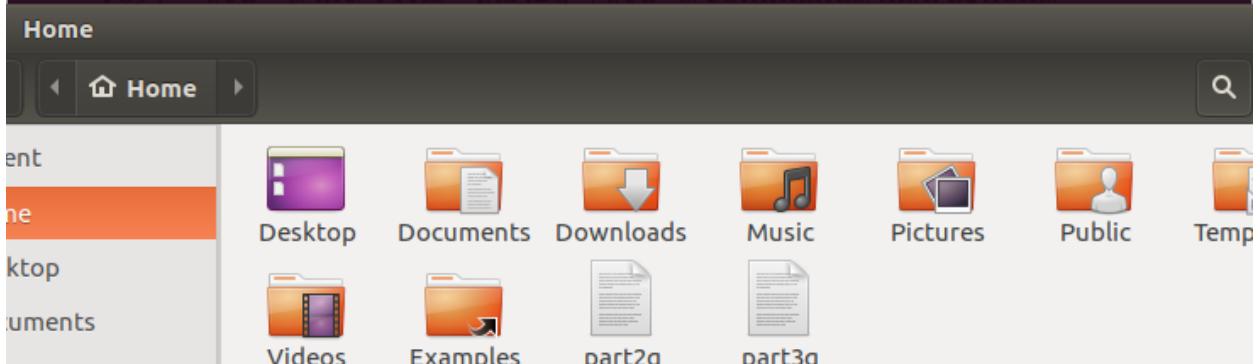
195) sed '/commands/ s/the/THE/' part2q - replace first occurrence "the" to "THE" which comes before the "commands" in sentences of part2q

```
navruzjn@navruzjn-VirtualBox:~$ sed '/commands/ s/the/THE/' part2q  
type this text at the console each on separate lines including this line  
your PART2 question - State THE Purpose of these commands and Indicate the  
outputs generated when THEse commands are executed. Execute the commands  
one after another in the same given order 1) to 200). Clearly explain the  
format of the output with all the fields and their meaning.  
Provide all the screen shots.
```

196) cp part2q part3q - create copy of part2q as part3q in the same direction

```
navruzjn@navruzjn-VirtualBox:~$ cp part2q part3q  
navruzjn@navruzjn-VirtualBox:~$ ls
```

189) sed 's/the/THE/' part2q | sed 's/commands/instructions/'



197) sed '3 d' part3q - delete 3 rd line in file part3q

```
navruzjn@navruzjn-VirtualBox:~$ sed '3 d' part3q  
type this text at the console each on separate lines including this line  
your PART2 question - State the Purpose of these commands and Indicate the  
one after another in the same given order 1) to 200). Clearly explain the  
format of the output with all the fields and their meaning.  
Provide all the screen shots.
```

198) sed 'p' part3q - print every changed line to show changes in file part3q

```
navruzjn@navruzjn-VirtualBox:~$ sed 'p' part3q  
type this text at the console each on separate lines including this line  
type this text at the console each on separate lines including this line  
your PART2 question - State the Purpose of these commands and Indicate the  
your PART2 question - State the Purpose of these commands and Indicate the  
outputs generated when these commands are executed. Execute the commands  
outputs generated when these commands are executed. Execute the commands  
one after another in the same given order 1) to 200). Clearly explain the  
one after another in the same given order 1) to 200). Clearly explain the  
format of the output with all the fields and their meaning.  
format of the output with all the fields and their meaning.  
Provide all the screen shots.  
Provide all the screen shots.
```

199) sed '2,\$ d' part3q - delete from 2nd line in file part3q

```
navruzjn@navruzjn-VirtualBox:~$ sed '2,$ d' part3q  
type this text at the console each on separate lines including this line
```

200) cat part3q - Concatenate part3q to standard output.

```
navruzjn@navruzjn-VirtualBox:~$ cat part3q
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.
```

201) sed --n 'commands/p' part3q - print every line which has "commands" to show after original in file part3q

```
navruzjn@navruzjn-VirtualBox:~$ sed --n '/commands/p' part2q
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.
```

```
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.
```

202) grep 'commands' part2q - search for and print only lines where has "commands" and highlight

```
navruzjn@navruzjn-VirtualBox:~$ grep 'commands' part2q
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
```

203) grep -v 'commands' part2q - search for and select non-matching lines where has "commands" for print

```
navruzjn@navruzjn-VirtualBox:~$ grep -v 'commands' part2q
type this text at the console each on separate lines including this line
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.
```

204) grep -w 'commands' part2q - force pattern to match only whole word "commands"

```
navruzjn@navruzjn-VirtualBox:~$ grep -w "commands" part2q
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
```

205) grep -B2 'State' part2q - print 2 lines of leading context till last "State"

```
navruzjn@navruzjn-VirtualBox:~$ grep -B2 "State" part2q
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of these commands and Indicate the
```

206) grep -A2 'State' part2q - print 2 lines of trailing context from "State"

```
navruzjn@navruzjn-VirtualBox:~$ grep -A 2 "State" part2q
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain the
```

207) grep -C2 'State' part2q - print 2 lines of output context where "State"

```
navruzjn@navruzjn-VirtualBox:~$ grep -C 2 "State" part2q
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain the
```

208) grep -B2 'and' part2q - print 2 line of leading context till last "and"

```
navruzjn@navruzjn-VirtualBox:~$ grep -B2 "and" part2q
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
```

209) grep -A2 'and' part2q - print 2 line of leading context from first "and"

```
navruzjn@navruzjn-VirtualBox:~$ grep -A2 "and" part2q
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.
```

210) grep -C2 'and' part2q - print 2 lines of output context where "and"

```
navruzjn@navruzjn-VirtualBox:~$ grep -C2 "and" part2q
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of these commands and Indicate the
outputs generated when these commands are executed. Execute the commands
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.
```

211) sed --n 'commands/!p' part2q - does not print lines which has "commands" to show after original in file part2q

```
navruzjn@navruzjn-VirtualBox:~$ sed -n '/commands/ !p' part2q
type this text at the console each on separate lines including this line
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.
```

212) sed '/commands/ a "You need to learn these commands which are very essential"' part2q - replace the text equivalent to 'You need to learn these commands which are very essential'

```
navruzjn@navruzjn-VirtualBox:~$ sed '/commands/ a "You need to learn these comma
nds which are very essential"' part2q
type this text at the console each on separate lines including this line
your PART2 question - State the Purpose of these commands and Indicate the
"You need to learn these commands which are very essential"
outputs generated when these commands are executed. Execute the commands
"You need to learn these commands which are very essential"
one after another in the same given order 1) to 200). Clearly explain the
format of the output with all the fields and their meaning.
Provide all the screen shots.
```

213) cal - print calendar of current month

```
navruzjn@navruzjn-VirtualBox:~$ cal part2q
Oktyabr 2017 grep -C 2 "and" part2q
Ya Du Se Ch Pa Ju Sh
 1  2  3  4  5  6  7
 8  9  10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31
```

214) cal -3 - print calendar including three months that 'current month-1' 'current month' 'current month+1'

```
navruzjn@navruzjn-VirtualBox:~$ cal -3
Sentyabr 2017 cal -y Oktyabr 2017 Noyabr 2017
Ya Du Se Ch Pa Ju Sh Ya Du Se Ch Pa Ju Sh Ya Du Se Ch Pa Ju Sh
 1  2  3  4  5  6  7  8  9  10 11 12 13 14  1  2  3  4
 3  4  5  6  7  8  9  8  9  10 11 12 13 14  5  6  7  8  9 10 11
10 11 12 13 14 15 16 15 16 17 18 19 20 21 12 13 14 15 16 17 18
17 18 19 20 21 22 23 22 23 24 25 26 27 28 19 20 21 22 23 24 25
24 25 26 27 28 29 30 29 30 31
```

215) cal -y - print calendar of current year

```

navruzjn@navruzjn-VirtualBox:~$ cal -y
2017
      Yanvar          Fevral          Mart
Ya Du Se Ch Pa Ju Sh Ya Du Se Ch Pa Ju Sh Ya Du Se Ch Pa Ju Sh
 1  2  3  4  5  6  7   1  2  3  4   1  2  3  4  5  6  7  8  9  10  11
 8  9 10 11 12 13 14   5  6  7  8  9 10 11  5  6  7  8  9 10 11
15 16 17 18 19 20 21 12 13 14 15 16 17 18 12 13 14 15 16 17 18
22 23 24 25 26 27 28 19 20 21 22 23 24 25 19 20 21 22 23 24 25
29 30 31           26 27 28           26 27 28 29 30 31

      Aprel          May            Iyun
Ya Du Se Ch Pa Ju Sh Ya Du Se Ch Pa Ju Sh Ya Du Se Ch Pa Ju Sh
 1           1  2  3  4  5  6           1  2  3
 2  3  4  5  6  7  8   7  8  9 10 11 12 13   4  5  6  7  8  9 10
 9 10 11 12 13 14 15 14 15 16 17 18 19 20 11 12 13 14 15 16 17
16 17 18 19 20 21 22 21 22 23 24 25 26 27 18 19 20 21 22 23 24
23 24 25 26 27 28 29 28 29 30 31           25 26 27 28 29 30
30

      Iyul          Avgust        Sentyabr
Ya Du Se Ch Pa Ju Sh Ya Du Se Ch Pa Ju Sh Ya Du Se Ch Pa Ju Sh
 1           1  2  3  4  5           1  2
 2  3  4  5  6  7  8   6  7  8  9 10 11 12  3  4  5  6  7  8  9
 9 10 11 12 13 14 15 13 14 15 16 17 18 19 10 11 12 13 14 15 16
16 17 18 19 20 21 22 20 21 22 23 24 25 26 17 18 19 20 21 22 23
23 24 25 26 27 28 29 27 28 29 30 31           24 25 26 27 28 29 30
30 31

      Oktyabr       Noyabr        Dekabr
Ya Du Se Ch Pa Ju Sh Ya Du Se Ch Pa Ju Sh Ya Du Se Ch Pa Ju Sh
 1  2  3  4  5  6  7   1  2  3  4           1  2
 8  9 10 11 12 13 14   5  6  7  8  9 10 11  3  4  5  6  7  8  9
15 16 17 18 19 20 21 12 13 14 15 16 17 18 10 11 12 13 14 15 16
22 23 24 25 26 27 28 19 20 21 22 23 24 25 17 18 19 20 21 22 23
29 30 31           26 27 28 29 30           24 25 26 27 28 29 30
31

```

216) passwd - change UNIX password used to login associated with the current effective user ID

```

navruzjn@navruzjn-VirtualBox:~$ passwd
Changing password for navruzjn.
(current) UNIX password:
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully

```

217) whoami - print the user name associated with the current effective user ID

```

navruzjn@navruzjn-VirtualBox:~$ whoami
navruzjn

```

218) users - prints the user names associated with all effective user IDs

```

navruzjn@navruzjn-VirtualBox:~$ users
navruzjn

```

219) mail -s "Test Mail" n.jandullaev@student.inha.uz - send a message with the given "I want to sleep, I want to eat" to n.jandullaev@student.inha.uz from "Test mail"

```
navruzjn@navruzjn-VirtualBox:~$ mail -s "Test Mail" n.jandullaev@student.inha.uz  
Cc: navruz.jandullaev@gmail.com  
I want to sleep (type out of this command press Ctrl C)  
I want to eat
```

220) mail -s "Test Mail" n.jandullaev@student.inha.uz <message.txt - send a message with from message.txt to n.jandullaev@student.inha.uz from "Test mail"

```
navruzjn@navruzjn-VirtualBox:~$ mail -s "Test Mail" n.jandullaev@student.inha.uz  
<message.txt
```

221) mail - prints all messages

```
navruzjn@navruzjn-VirtualBox:~$ mail  
"/var/mail/navruzjn": 1 message 1 unread  
>U 1 Mail Delivery Syst Du Okt 9 14:23 79/2802 Undelivered Mail Returned  
?  
Held 1 message in /var/mail/navruzjn
```

222) ping inha.uz - check connection and print how many packages loses during request/response with "inha.uz"

```
navruzjn@navruzjn-VirtualBox:~$ ping inha.uz  
PING inha.uz (195.158.19.237) 56(84) bytes of data.  
^C  
--- inha.uz ping statistics ---  
7 packets transmitted, 0 received, 100% packet loss, time 6133ms
```

223) ping inha.kr - check connection and print how many packages loses during request/response with "inha.kr"

```
navruzjn@navruzjn-VirtualBox:~$ ping inha.kr  
PING inha.kr (165.246.10.213) 56(84) bytes of data.  
^C  
--- inha.kr ping statistics ---  
7 packets transmitted, 0 received, 100% packet loss, time 6141ms
```

224) ping google.com - check connection and print how many packages loses during request/response with "google.com"

```
navruzjn@navruzjn-VirtualBox:~$ ping google.com  
PING google.com (172.217.20.206) 56(84) bytes of data.  
^C64 bytes from 172.217.20.206: icmp_seq=1 ttl=43 time=171 ms  
  
--- google.com ping statistics ---  
1 packets transmitted, 1 received, 0% packet loss, time 0ms  
rtt min/avg/max/mdev = 171.338/171.338/171.338/0.000 ms
```

225) ping amazon.com - check connection and print how many packages loses during request/response with "amazon.com"

```
navruzjn@navruzjn-VirtualBox:~$ ping amazon.com  
PING amazon.com (54.239.25.192) 56(84) bytes of data.  
64 bytes from 54.239.25.192 (54.239.25.192): icmp_seq=1 ttl=228 time=508 ms  
64 bytes from 54.239.25.192 (54.239.25.192): icmp_seq=2 ttl=228 time=351 ms  
64 bytes from 54.239.25.192 (54.239.25.192): icmp_seq=3 ttl=228 time=278 ms  
64 bytes from 54.239.25.192 (54.239.25.192): icmp_seq=4 ttl=228 time=450 ms  
64 bytes from 54.239.25.192 (54.239.25.192): icmp_seq=5 ttl=228 time=678 ms  
64 bytes from 54.239.25.192 (54.239.25.192): icmp_seq=6 ttl=228 time=293 ms  
64 bytes from 54.239.25.192 (54.239.25.192): icmp_seq=7 ttl=228 time=728 ms  
64 bytes from 54.239.25.192 (54.239.25.192): icmp_seq=8 ttl=228 time=340 ms  
^C  
--- amazon.com ping statistics ---  
8 packets transmitted, 8 received, 0% packet loss, time 9590ms  
rtt min/avg/max/mdev = 278.250/453.945/728.891/161.658 ms
```

226) whereis linux - locate the binary, source, and manual-page files for a command in directory of linux.

```
navruzjn@navruzjn-VirtualBox:~$ whereis linux  
linux: /usr/include/linux
```

227) which ./case.sh - command to locate path for case.sh, this command is really helpful to find path of executable commands that user don't know about its location.

```
→ Assignment1 git:(master) ✘ which ./case.sh  
./case.sh
```

228) mount - mount a filesystem

```
navruzjn@navruzjn-VirtualBox:~$ mount  
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime)  
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)  
udev on /dev type devtmpfs (rw,nosuid,relatime,size=955548k,nr_inodes=238887,mode=755)  
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,gid=5,mode=620,ptmxmode=000)  
tmpfs on /run type tmpfs (rw,nosuid,noexec,relatime,size=195676k,mode=755)  
/dev/sda1 on / type ext4 (rw,relatime,errors=remount-ro,data=ordered)  
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)  
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev)  
tmpfs on /run/lock type tmpfs (rw,nosuid,nodev,noexec,relatime,size=5120k)  
tmpfs on /sys/fs/cgroup type tmpfs (ro,nosuid,nodev,noexec,mode=755)  
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime,xattr,release_agent=/lib/systemd/systemd-cgroups-agent,name=systemd)  
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime)  
cgroup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freeze)  
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices)  
cgroup on /sys/fs/cgroup/net_cls,net_prio type cgroup (rw,nosuid,nodev,noexec,relatime,net_cls,net_prio)
```

229) vmstat - Report virtual memory statistics

```
navruzjn@navruzjn-VirtualBox:~$ vmstat  
procs -----memory----- swap-----io-----system-----cpu-----  
 r b swpd free buff cache si so bi bo in cs us sy id wa st  
 0 0 0 334836 38824 862376 0 0 145 119 210 664 10 2 88 0 0
```

230) netstat - active internet connections ip and pid

```
navruzjn@navruzjn-VirtualBox:~$ netstat  
Active Internet connections (w/o servers)  
Proto Recv-Q Send-Q Local Address           Foreign Address         State  
tcp        0      0 navruzjn-VirtualBox:47982 mirror2.sarkor.uz:http TIME_WAIT  
Active UNIX domain sockets (w/o servers)  
Proto RefCnt Flags       Type      State          I-Node      Path  
unix  3      [ ]     DGRAM    CONNECTED       1964      /run/systemd/notify  
unix  2      [ ]     DGRAM    TIME_WAIT     1966      /run/systemd/cgroups-agent  
unix  22     [ ]     DGRAM    TIME_WAIT     1976      /run/systemd/journal/dev-log  
unix  8      [ ]     DGRAM    TIME_WAIT     1982      /run/systemd/journal/socket  
unix  2      [ ]     DGRAM    TIME_WAIT     1993      /run/systemd/journal/syslog  
unix  2      [ ]     DGRAM    TIME_WAIT     20961     /run/user/1000/systemd/notify  
unix  3      [ ]     STREAM   CONNECTED      23571      /var/run/dbus/system_bus_socket  
unix  3      [ ]     STREAM   CONNECTED      18394      /var/run/dbus/system_bus_socket  
unix  3      [ ]     STREAM   CONNECTED      32386  
unix  3      [ ]     STREAM   CONNECTED      32327  
unix  3      [ ]     STREAM   CONNECTED      24623      /run/systemd/journal/stdout  
unix  3      [ ]     STREAM   CONNECTED      22966  
unix  3      [ ]     STREAM   CONNECTED      21075  
unix  3      [ ]     STREAM   CONNECTED      20374      /run/systemd/journal/stdout  
unix  3      [ ]     STREAM   CONNECTED      24252  
unix  3      [ ]     STREAM   CONNECTED      23567      /run/user/1000/bus  
unix  3      [ ]     STREAM   CONNECTED      21939  
unix  3      [ ]     STREAM   CONNECTED      17622      /var/run/dbus/system_bus_socket  
unix  3      [ ]     STREAM   CONNECTED      25597  
unix  3      [ ]     STREAM   CONNECTED      32380
```

2B

1. find . -type l

```
→ Assignment1 git:(master) X find . -type l  
./list2  
→ Assignment1 git:(master) X █
```

2. touch fileop.c

```
→ Assignment1 git:(master) touch fileop.c  
→ Assignment1 git:(master) X ls | grep fileop.c  
fileop.c  
→ Assignment1 git:(master) X █  
Give a linux command to make the file fileop.c or
```

3. chmod --verbose a-rwX,u+r fileop.c

```
→ Assignment1 git:(master) X chmod --verbose a-rwX,u+r fileop.c  
mode of 'fileop.c' changed from 0644 (rw-r--r--) to 0400 (r-----)  
→ Assignment1 git:(master) X ls -la fileop.c  
-r----- 1 bedilbek bedilbek 0 Okt 6 23:38 fileop.c  
→ Assignment1 git:(master) X █
```

4. uname -a

After entering this command we will see all the information about operation system, and we see that Ubuntu is running on this Linux

```
→ Assignment1 git:(master) X uname -a  
Linux bedilbek-machine 4.10.0-35-generic #39-Ubuntu SMP Wed Sep 13 07:46:59 UTC  
2017 x86_64 x86_64 x86_64 GNU/Linux 9. How do you check how much space left  
→ Assignment1 git:(master) X █ 10. What is the difference between ps -ef and
```

5. First we will run a process (Gnome editor) by its command `gedit`.

now we will suspend it by pressing the buttons (^Z).

After executing `bg %gedit` command gedit will continue running in background.

After executing `fg %gedit` command gedit will continue running in foreground.

Now we will suspend it by pressing the buttons (^Z).

Now if we write `bg` command itself, then it will bring the first process that is in foreground to background.

So now gedit is running in background.

We can find the pid of this process by executing the command `ps -la`.

Now with the found pid we will terminate the process: `sudo kill 9 12703`.

```

→ Assignment1 git:(master) X gedit
^Z
[1] + 12703 suspended gedit about operation system
→ Assignment1 git:(master) X bg %gedit
[1] + 12703 continued gedit
→ Assignment1 git:(master) X jobs
[1] + running gedit little running in background.
→ Assignment1 git:(master) X ps in foreground.
  PID TTY          TIME CMD
 6996 pts/0    00:00:02 zsh
12703 pts/0    00:00:01 gedit
12849 pts/0    00:00:00 ps
→ Assignment1 git:(master) X fg %gedit
[1] + 12703 running gedit
^Z
[1] + 12703 suspended gedit
→ Assignment1 git:(master) X bg
[1] + 12703 continued gedit
→ Assignment1 git:(master) X sudo kill 9 12703
[1] + 12703 terminated gedit
→ Assignment1 git:(master) X █

```

6. to know if remote host is alive we will use command `ping`

ping -c 3 google.com

we are sending 3 packets to google.com to know if the service is alive or not

```

→ Assignment1 git:(master) X ping -c 3 google.com [background to background]
PING google.com (173.194.222.101) 56(84) bytes of data.
64 bytes from lo-in-f101.1e100.net (173.194.222.101): icmp_seq=1 ttl=41 time=112 ms
64 bytes from lo-in-f101.1e100.net (173.194.222.101): icmp_seq=2 ttl=41 time=112 ms
64 bytes from lo-in-f101.1e100.net (173.194.222.101): icmp_seq=3 ttl=41 time=111 ms

--- google.com ping statistics ---alive or not
3 packets transmitted, 3 received, 0% packet loss, time 2001ms
rtt min/avg/max/mdev = 111.861/112.252/112.520/0.282 ms
→ Assignment1 git:(master) X clear

```

7. to know history of earlier command we will use command `history`

```

→ Assignment1 git:(master) X history
 1 cd app/
 2 ls
 3 cd .. /дикон давлат... 17:20
 4 git
 5 ~/.zshrc
 6 sudo subl ~/.zshrc 17:21
 7 cd
 8 grep -r robyrussell
 9 sudo grep -r robyrussell /
10 sudo grep -r --verbose robyrussell /
11 sudo grep -r robyrussell /
12 sudo
13 ls
14 sudo subl ~/.zshrc 17:20
15 cd web/php-backend/
16 zsh5
17 zsh
18 zsh
19 git checkout master
20 cd
21 git clone git://github.com/altercation/solarized.git
22 brew cask install iterm2
23 cd

```

8. we will use command `top` to find which process is taking how much time, and in the column %CPU we can see the CPU usage percentage of processes

top - 18:03:04 up 1:00, 1 user, load average: 0.41, 0.42, 0.48											
Tasks: 267 total, 1 running, 266 sleeping, 0 stopped, 0 zombie											
%Cpu(s): 5.2/2.7 8[██████]											
PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
4421	bedilbek	20	0	1260716	107600	55216	S	13.5	2.7	4:36.74	compiz
2091	root	20	0	504648	80388	48368	S	10.2	2.0	2:35.10	Xorg
15925	bedilbek	20	0	441504	26372	20156	S	2.3	0.7	0:00.33	gnome-screensho
9101	bedilbek	20	0	1351740	239152	111212	S	1.3	6.1	1:13.01	chrome
14996	bedilbek	20	0	1677500	113996	69200	S	1.3	2.9	0:08.59	Telegram
15922	bedilbek	20	0	45876	4224	3552	R	1.0	0.1	0:01.05	top
15507	root	20	0	0	0	0	S	0.7	0.0	0:00.44	kworker/1:0
7	root	20	0	0	0	0	S	0.3	0.0	0:07.10	rcu_sched
23	root	20	0	0	0	0	S	0.3	0.0	0:02.20	kworker/2:0
3594	root	20	0	492868	48760	29808	S	0.3	1.2	0:14.15	dockerd
4451	bedilbek	20	0	669320	46872	26476	S	0.3	1.2	0:20.81	unity-panel-ser
9348	bedilbek	20	0	879676	105396	59920	S	0.3	2.7	0:09.33	chrome
14233	root	20	0	0	0	0	S	0.3	0.0	0:01.30	kworker/0:1
15179	root	20	0	0	0	0	S	0.3	0.0	0:00.20	kworker/3:0
1	root	20	0	205564	7796	5304	S	0.0	0.2	0:07.35	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kthreadd
4	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	kworker/0:0H

9. to check how much space left in the disk, execute command `df -h` and see the column Available

```
→ Assignment1 git:(master) X df -h .
Filesystem      Size  Used Avail Use% Mounted on
/dev/sda2       110G  49G   56G  47% /
→ Assignment1 git:(master) X 4. How will
```

10. `ps -a` option causes ps to list all processes created within this terminal

`ps -ef` options cause `-e` option to list all processes and `-f` option to add extra columns of full information about the running processes

```
→ Assignment1 git:(master) X ps -a
  PID TTY      TIME CMD
16634 pts/0    00:00:00 man
16646 pts/0    00:00:00 less
17863 pts/0    00:00:00 ps
→ Assignment1 git:(master) X ps -ef
UID  After PID PPID C STIME TTY will see +TIME CMDformation about open
root  screens 1 2 0 0 17:03 ?          00:00:07 /sbin/init splash
root  5.      2 0 0 17:03 ?          00:00:00 [kthreadd]
root  First w 4 2 0 17:03 ?          00:00:00 [kworker/0:0H]
root  how we'll su 6 2 0 17:03 ?          00:00:00 [ksoftirqd/0]
root  After e 7 2 0 17:03 ? command 00:00:09 [rcu_sched]
root  Now we'll su 8 2 0 17:03 ? lessing 00:00:00 [rcu_bh]
root  Now if 9 write 2 0 17:03 ? itself 00:00:00 [migration/0]first proc
root  So no 10 dit 2 0 17:03 ? background 00:00:00 [lru-add-drain]
root  We can 11 2 0 17:03 ? process 00:00:00 [watchdog/0]
root  Now we'll 12 2 0 17:03 ? all term 00:00:00 [cpuhp/0]
root  screen 13 2 0 17:03 ? 00:00:00 [cpuhp/1]
root  6. to 14 2 0 17:03 ? alive 00:00:00 [watchdog/1]
root  ping 15 2 0 17:03 ? 00:00:00 [migration/1] is alive
root  we are 16 2 0 17:03 ? google.com 00:00:00 [ksoftirqd/1]
root  screen 17 2 0 17:03 ? 00:00:00 [cpuhp/2]
root  7. to 18 2 0 17:03 ? or command 00:00:00 [kworker/1:0H]ory
root  screen 19 2 0 17:03 ? 00:00:00 [cpuhp/2]
root  8. we 20 2 0 17:03 ? to find 00:00:00 [watchdog/2] how much
root  of processes 21 2 0 17:03 ? 00:00:00 [migration/2]
root  screen 22 2 0 17:03 ? 00:00:00 [ksoftirqd/2]
root  9. to 23 2 0 17:03 ? 00:00:02 [kworker/2:0]
root  screen 24 2 0 17:03 ? to lis 00:00:00 [kworker/2:0H]
root  10. ps 25 2 0 17:03 ? option 00:00:00 [cpuhp/3] and off with
```

11. to find number of processors we use command `nproc` or `grep -E 'cpu cores' /proc/cpuinfo` or from saved file `grep -E 'cpu cores' infocpu`

```
→ Assignment1 git:(master) X grep -E 'cpu cores' /proc/cpuinfo
cpu cores      : 4
cpu cores 32-bit: 4 64-bit
cpu cores      : 4
cpu cores      : 4
→ Assignment1 git:(master) X grep -E 'cpu cores' infocpu
cpu cores      : 4
cpu cores      : 4
cpu cores      : 4
cpu cores      : 4
→ Assignment1 git:(master) X nproc
4
→ Assignment1 git:(master) X █
```

12. we will use ps and grep to find running zombie processes

```
'ps axo stat,ppid,pid,tty,time,cmd | grep -e '^Z'
```

```
→ Assignment1 git:(master) X ps axo stat,ppid,pid,tty,time,cmd | grep -e '^Z'
→ Assignment1 git:(master) X █
```

13. we will use command `find / -name 'part2q' -print` to find file part2q starting from root directory

```
→ ~ sudo find / Fall -name 'part2q' -print
[sudo] password for bedilbek:
/home/bedilbek/IUT Junior Fall/Operating System/Assignments/Assignment1/part2q
█
```

14. `uname -m` or `arch` commands find whether system is 32-bit or 64-bit

```
→ Assignment1 git:(master) X uname -m
x86_64
→ Assignment1 git:(master) X arch
x86_64
→ Assignment1 git:(master) X █
```

15. We can use command `ps` with formatting the output columns to find which process is accessing which file

```
→ Assignment1 git:(master) X ps o fname,ppid,pid,time,cmd
COMMAND   PPID   PID   TIME CMD
top       6996  5001  00:00:01 top
ps        6996  5155  00:00:00 ps o fname,ppid,pid,time,cmd
zsh      6989  6996  00:00:07 zsh
man     6996 16634  00:00:00 man df
less    16634 16646  00:00:00 less
man     6996 20135  00:00:00 man grep
less    20135 20147  00:00:00 less
grep    6996 20861  00:00:00 grep --color=auto --exclude-dir=.bzr --exclude-dir=CVS
→ Assignment1 git:(master) X █
```

Here in the screenshot first column "COMMAND" shows the files that are being used with corresponding processes

16. we will use command `sed -i 's/the/THE/g' part2q` to replace all occurrences of the with THE

```
→ Assignment1 git:(master) ✘ sed -i 's/the/THE/g' part2q
→ Assignment1 git:(master) ✘ cat part2q
type this text at THE console each on separate lines including this line
your PART2 question - State THE Purpose of THESE commands and Indicate THE
outputs generated when THEse commands are executed. Execute THE commands
one after anoTHER in THE same given order 1) to 200). Clearly explain THE
format of THE output with all THE fields and THEir meaning.
Provide all THE screen shots. Shakhobiddin Urmanov
→ Assignment1 git:(master) ✘
```

17. `cut -b11-12 listdir`

18. we will use `du` command with `-h` option to add human readability and `-d` option to determine depth of recursive accessing to directories in home directory to find space usage of directories there

sudo du -hd 1

```
→ ~ sudo du -hd 1
12K    ./conda
5.7M   ./IUT Junior Fall
1.2G   ./cache
85M    ./CLion2017.2
27M    ./Desktop
24K    ./astropy
24K    ./gconf
2.4G   ./Videos
8.0K   ./soapuios
21M    ./DataGrip2016.3
8.0K   ./nano
36K    ./gnome
3.0G   ./local
1.6G   ./Pictures
520K   ./gimp-2.8
12K    ./dbus
6.4M   ./mozilla
24K    ./ssh
8.0K   ./putty
4.0K    ./bedilbekiPhone
76K    ./pki
535M   ./PhpStorm2017.2
8.0K   ./remmina
54M    ./solarized
288M   ./PyCharm2017.1
68K    ./ipython
6.6G   ./INSTALL
538M   ./PhpStorm2017.1
671M   ./linuxbrew
6.4M   ./CLionProjects
16K    ./GitBook
128K   ./compiz
2.5M   ./BuildServer
4.0K    ./database
4.0K    ./Templates
20M    ./wine
60K    ./PhpstormProjects
743M   ./Downloads
3.6M   ./PlayOnLinux
4.0K   ./composer
7.2M   ./Documents
20K    ./jNotebooks
15M    ./usr
4.0K   ./gphoto
180K   ./PycharmProjects
1.8G   ./web
6.2M   ./oh-my-zsh
8.0K   ./Todo
6.6M   ./thunderbird
491M   ./config
316K   ./java
4.0K   ./Public
4.0K   ./Music
20G    .
→ ~ man du
→ ~
```

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19. to find how long system is up `uptime -p` -o option to prettify the output

```
→ Assignment1 git:(master) ✘ uptime -p
up 5 hours, 51 minutes
→ Assignment1 git:(master) ✘
```

20. `rev listdir | tee listdir` command displays all lines of listdir in reverse order and writes output to listdir file

```

→ Assignment1 git:(master) X rev listdir | tee listdir
2321 latot
. 13:22 8 tk0 6904 keblideb keblideb 5 x-rx-rxwrd
.. 62:02 8 tk0 6904 keblideb keblideb 4 x-rx-rxwrd
1 00:12 8 tk0 487 keblideb keblideb 1 --r--r-wr- 13 p' core4info | wc
elif_secila 90:22 6 tk0 67 keblideb keblideb 1 x-rx-rxwr-
hs.yarra 35:12 8 tk0 511 keblideb keblideb 1 --r--r-wr-
ehs.yarra 90:22 6 tk0 411 keblideb keblideb 1 --r--r-wr- core4info | rev
dm.tnemngissA 64:22 8 tk0 5669 keblideb keblideb 1 --r--r-wr-
keblideB 43:22 8 tk0 982 keblideb keblideb 1 --r--r-wr-
hs.esac 10:00 8 tk0 2031 keblideb keblideb 1 x-rx-rxwr- 18 p' core4info | v
hs.selifc 90:22 6 tk0 962 keblideb keblideb 1 --r--r-wr-
hs.ypoc 90:22 6 tk0 501 keblideb keblideb 1 --r--r-wr-
elif_otypoc 90:22 6 tk0 54 keblideb keblideb 1 x-rx-rxwr- core4info | v
ofni0eroc 01:02 8 tk0 0 keblideb keblideb 1 --r--r-wr-
ofni4eroc 01:02 8 tk0 0 keblideb keblideb 1 --r--r-wr-
hs.tcaf 90:22 6 tk0 452 keblideb keblideb 1 --r--r-wr- is Not Unix" | ro
hs.tnuocf 90:22 6 tk0 672 keblideb keblideb 1 x-rx-rxwr-
elif 90:22 6 tk0 55 keblideb keblideb 1 --r--r-wr-
1 elif 12:12 8 tk0 9482 keblideb keblideb 1 --r--r-wr- core4info
c.po elif 83:32 6 tk0 0 keblideb keblideb 1 -----r-
repo_elif 90:22 6 tk0 80031 keblideb keblideb 1 x-rx-rxwr-
c.repo_elif 90:22 6 tk0 3233 keblideb keblideb 1 --r--r-wr- info
hs.tsilf 90:22 6 tk0 822 keblideb keblideb 1 --r--r-wr-
hs.trosf 90:22 6 tk0 196 keblideb keblideb 1 x-rx-rxwr-
tig. 64:22 8 tk0 6904 keblideb keblideb 8 x-rx-rxwrd- file.txt
erongitig. 45:12 6 tk0 86 keblideb keblideb 1 --r--r-wr-
xcod.1WH 40:12 6 tk0 484005 keblideb keblideb 1 --r--r-wr-
aedi. 33:71 7 tk0 6904 keblideb keblideb 2 x-rx-rxwrd- d' core4info
upcofni 04:81 7 tk0 1283 keblideb keblideb 1 --r--r-wr- d' core4info
enil_tsal 34:51 8 tk0 75 keblideb keblideb 1 --r--r-wr-
hs.senil_tsal 54:51 8 tk0 65 keblideb keblideb 1 --r--r-wr- e4info
hs.nel 90:22 6 tk0 701 keblideb keblideb 1 --r--r-wr-
ridtsil 64:22 8 tk0 0 keblideb keblideb 1 --r--r-wr- f2,3 core4info
hs.tsilxam 90:22 6 tk0 913 keblideb keblideb 1 --r--r-wr- f2,3 core4info
hs.xam 90:22 6 tk0 912 keblideb keblideb 1 --r--r-wr-
egasu_yromem 20:12 8 tk0 691 keblideb keblideb 1 --r--r-wr- f2,3 core4info
seman 90:22 6 tk0 241 keblideb keblideb 1 --r--r-wr- f2- core4info
c.tcaf 01:02 8 tk0 0 keblideb keblideb 1 --r--r-wr-
fdp.1_TNEMNGISSA_EMOH_SO 40:12 6 tk0 687865 keblideb keblideb 1 --r--r-wr-
q2trap 73:71 8 tk0 583 keblideb keblideb 1 --r--r-wr- f2,4 /etc/passwd
hs.kovni_corp 90:22 6 tk0 781 keblideb keblideb 1 --r--r-wr-
hs.kovni_corp 90:22 6 tk0 781 keblideb keblideb 1 --r--r-wr- f2,4 /etc/passwd password

```

21.

first use command `top` to list all running processes.

there are two ways to sort by cpu usage.

1) press 'F' button, select '%CPU' and press button 's' and press 'Esc', now processes are sorted by CPU usage

2) press button '<' or '>' until sorting reaches '%CPU'

```

top - 23:09:33 up 6:06, 1 user, load average: 0.43, 0.34, 0.29
Tasks: 271 total, 1 running, 270 sleeping, 0 stopped, 0 zombie
%Cpu(s): 5.0 us, 4.5 sy, 0.0 ni, 89.3 id, 1.0 wa, 0.0 hi, 0.1 si, 0.0 st
KiB Mem : 3924804 total, 556568 free, 1561768 used, 1806468 buff/cache
KiB Swap: 2097148 total, 1405304 free, 691844 used. 1761080 avail Mem

%CPU   PID USER      PR  NI  %MEM COMMAND
14.6  4421 bedilbek  20   0  5.1 compiz
12.9  2091 root     20   0  2.3 Xorg
2.3  14593 bedilbek  20   0  0.6 gnome-screensho
1.7  9101 bedilbek  20   0  5.2 chrome
1.0  900 message+   20   0  0.1 dbus-daemon
1.0  13365 root     20   0  0.0 kworker/3:3 execute command 'df -h' and see the col
1.0  13671 root     20   0  0.0 kworker/1:3
0.7   7 root       20   0  0.0 rcu_sched
0.7  13461 root     20   0  0.0 kworker/2:0
0.7  13964 bedilbek  20   0  0.1 top
0.3   1 root       20   0  0.2 systemd command 'inproc' or 'grep -E "cpu cores" /proc
0.3  878 root     20   0  0.1 repowerd
0.3  1113 root     20   0  0.2 polkitd
0.3  1767 memcache  20   0  0.0 memcached
0.3  1793 systemd+  20   0  0.1 systemd-resolve
0.3  1849 mysql    20   0  0.4 mysqld
0.3  3594 root     20   0  0.5 dockerd
0.3  3661 root     20   0  0.2 docker-containe
0.3  3947 bedilbek  20   0  0.1 dbus-daemon
0.3  4191 bedilbek  20   0  0.1 indicator-datet
0.3  4451 bedilbek  20   0  1.0 unity-panel-ser
0.3  9348 bedilbek  20   0  2.2 chrome
0.3 10211 bedilbek  20   0  1.1 gnome-terminal-
0.3 11698 bedilbek  20   0  2.3 sublime_text
0.3 12968 root     20   0  0.0 kworker/u8:3
0.3 14161 root     20   0  0.0 kworker/0:0
0.0  502 root     20   0  0.0 kthreadd
0.0  194 root     20   0  -20 0.0 kworker/0:0H -o option to prettify the output
0.0   6 root       20   0  0.0 ksoftirqd/0
0.0  200 root     20   0  0.0 rcu_bh

```

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22. to display 10 lines of case.sh we will use command `head -10 case.sh`

```

→ Assignment1 git:(master) ✘ head -10 case.sh
#!/bin/bash
#Menu Driven program to perform listed operations
loop=1
while [ $loop -eq 1 ]
do
echo .....
echo .
MENU
.
echo .
→ Assignment1 git:(master) ✘

```

23. to display last 5 lines of case.sh we will use command `tail -5 case.sh`

```

→ Assignment1 git:(master) ✘ tail -5 case.sh
*)
echo INVALID CHOICE - READ MENU CORRECTLY
;;
esac
done%
→ Assignment1 git:(master) ✘

```

24. we will use command `tar cvzf hw1.tar.gz HW1.docx` to compress HW1.docx

an then use command `tar xvzf hw1.tar.gz` to decompress that file

```

→ Assignment1 git:(master) X tar cvzf hw1.tar.gz HW1.docx
HW1.docx
→ Assignment1 git:(master) X ls
alices_file case.sh fact.sh file_oper HW1.docx maxlist.sh README.md
array.sh cfiles.sh fcount.sh file_oper.c hw1.tar.gz max.sh
Assignment.md copy.sh file flist.sh infocpu names
Bedilbek crypto_file fileop.c fsort.sh len.sh OS_HOME_ASSIGNMENT_1.pdf
→ Assignment1 git:(master) X tar xvzf hw1.tar.gz listdir file created in
HW1.docx
→ Assignment1 git:(master) X ls
alices_file case.sh fact.sh file_oper HW1.docx maxlist.sh README.md
array.sh cfiles.sh fcount.sh file_oper.c hw1.tar.gz max.sh
Assignment.md copy.sh file flist.sh infocpu names
Bedilbek crypto_file fileop.c fsort.sh len.sh OS_HOME_ASSIGNMENT_1.pdf
→ Assignment1 git:(master) X ls
20. Give a linux command to reverse
21. Give a linux command to display

```

25. we will use command `cat -n` to display lines of file along with line number

```

→ Assignment1 git:(master) X cat -n array.sh
 1#!/bin/bash
 2 list=(12 67 123 49 88 123 -9 0 456 126)
 3 let I=0
 4 while [ $I -le 9 ]
 5 do
 6 echo ${list[$I]}
 7 let I=$I+1
 8 done
→ Assignment1 git:(master) X

```

26. we will use command `chmod -v +x case.sh` to give execution access to all

```

→ Assignment1 git:(master) X chmod -v +x case.sh
mode of 'case.sh' changed from 0644 (rw-r--r--) to 0755 (rwxr-xr-x)
→ Assignment1 git:(master) X

```

27. asks the user to delete all files in the current directory, if user presses button `y` then it deletes all files in that directory

```

→ hey ls -la
total 8
drwxr-xr-x 2 bedilbek bedilbek 4096 Okt 8 00:08 .
drwxr-xr-x 4 bedilbek bedilbek 4096 Okt 8 00:06 ..
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 8 00:08 1.c
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 8 00:08 2.c
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 8 00:08 3.c
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 8 00:08 4.c
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 8 00:08 5.c
→ hey rm -r *
zsh: sure you want to delete all the files in /home/bedilbek/IUT Junior Fall/Operating System/Assignments? [yn]? y
→ hey ls -la
total 8
drwxr-xr-x 2 bedilbek bedilbek 4096 Okt 8 00:09 .
drwxr-xr-x 4 bedilbek bedilbek 4096 Okt 8 00:06 .. the files that are being used with corresponding processes
→ hey

```

28. diff compares files line by line, whereas cmp compares byte by byte.

SOC33

```
→ Assignment1 git:(master) X cmp array.sh fact.sh
array.sh fact.sh differ: byte 13, line 2
→ Assignment1 git:(master) X diff array.sh fact.sh
2,4c2,8
< list=(12 67 123 49 88 123 -9 0 456 126)
< let I=0
< while [ $I -le 9 ]
-->
> echo =====
> A=1
> B=1
> echo Computing FACTORIAL OF $n
> echo ENTER VALUE OF n=0 sort by cpu usage.
> read n
> until [ $A -gt $n ]
> done
> B=$(expr $B \* $A)
> A=$(expr $A + 1)
> done
> echo FACTORIAL OF $n = $B
> echo PRESS Enter KEY to delete all files in the current direct
> read key
> rm *
→ Assignment1 git:(master) X
```

29. `more -1 array.sh` and `head -1 array.sh` can be used to display first line of array.sh

```
→ Assignment1 git:(master) X more -1 array.sh
#!/bin/bash
→ Assignment1 git:(master) X head -1 array.sh
#!/bin/bash
→ Assignment1 git:(master) X
```

30. `tail -1 array.sh` and `less -X array.sh` can be used to display last line of array.sh

```
→ Assignment1 git:(master) X less -X array.sh
#!/bin/bash
list=(12 67 123 49 88 123 -9 0 456 126)
let I=0
while [ $I -le 9 ]
do
echo ${list[$I]}
let I=$I+1
done
array.sh (END)
```

31. to find the process that is taking maximum memory we will use command `ps` and `sed`

`ps -eo ppid,pid,cmd,%mem --sort=-%mem | sed -n -e '1 p' -e '2 p'` this command formats the output of processes and sorts them by memory percentage in descing order, so we know that 1 row will be format and 2 row will be the process that we are seeking for

```
→ Assignment1 git:(master) X ps -eo ppid,pid,cmd,%mem --sort=-%mem | sed -n -e '1 p' -e '2 p'  
PPID PID CMD %MEM  
5196 6133 /opt/google/chrome/chrome 5.2  
→ Assignment1 git:(master) X
```

Here in the screenshot we see that google chrome is taking maximum memory 5.2% on my system.

32. to find only hidden files in current directory we can use command `find . -type f -iname ".*"

```
→ Assignment1 git:(master) X find . -type f -iname ".*"  
./.gitignore  
→ Assignment1 git:(master) X  
→ Assignment1 git:(master) X
```

33. to find currently running process we can display all processes and by filtering we can get only running ones.

`ps -eo state,ppid,pid,time,cmd | grep '^R'

```
→ Assignment1 git:(master) X ps -eo state,ppid,pid,time,cmd | grep '^R'  
R 7920 25769 00:00:00 ps -eo state,ppid,pid,time,cmd  
→ Assignment1 git:(master) X
```

34. `df -h /` by executing this command and seeing the column Available can give information about remaining disk space on system

```
→ Assignment1 git:(master) X df -h /  
Filesystem Size Used Avail Use% Mounted on  
/dev/sda2 110G 50G 54G 49% /  
→ Assignment1 git:(master) X
```

35. `wc --lines listdir` command is used to count number of lines in listdir

```
→ Assignment1 git:(master) X wc --lines listdir  
45 listdir  
→ Assignment1 git:(master) X
```

36. `wc --words listdir` command is used to count number of words in listdir

```
→ Assignment1 git:(master) X wc --words listdir  
398 listdir  
→ Assignment1 git:(master) X
```

37. `wc --chars listdir` command is used to count number of characters in listdir

```
→ Assignment1 git:(master) X wc --chars listdir  
2675 listdir  
→ Assignment1 git:(master) X
```

38. yes, by command `rm -r *` all files and subdirectories can be deleted

```

→ directory mkdir subdirectory1/subsubdirectory1
→ directory mkdir subdirectory2
→ directory touch file1
→ directory touch file2
→ directory touch file1.c
→ directory touch file2.c
→ directory ls -la
total 16
drwxr-xr-x 4 bedilbek bedilbek 4096 Okt 8 20:26 .
drwxr-xr-x 4 bedilbek bedilbek 4096 Okt 8 20:26 ..
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 8 20:26 file1
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 8 20:26 file1.c
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 8 20:26 file2
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 8 20:26 file2.c
drwxr-xr-x 3 bedilbek bedilbek 4096 Okt 8 20:26 subdirectory1
drwxr-xr-x 2 bedilbek bedilbek 4096 Okt 8 20:26 subdirectory2
→ directory rm -r *
zsh: sure you want to delete all the files in /home/bedilbek/IUT Junior Fall/Operating System/Assignments/directory [yn]? y
→ directory ls -la
total 8
drwxr-xr-x 2 bedilbek bedilbek 4096 Okt 8 20:27 .
drwxr-xr-x 4 bedilbek bedilbek 4096 Okt 8 20:26 ..
→ directory

```

39. tee command is used to read from input and write to standard output and files. For example:

`ps -o pid,tty,time,cmd,%mem --sort=%mem | tee memory_usage`

```

→ Assignment1 git:(master) X ps -o pid,tty,time,cmd,%mem --sort=%mem | tee memory_usage
  PID TT      TIME CMD          %MEM
  6075 pts/0    00:00:03 zsh      0.1
14105 pts/0    00:00:00 ps -o pid,tty,time,cmd,%mem  0.0
14106 pts/0    00:00:00 tee memory_usage      0.0
→ Assignment1 git:(master) X cat memory_usage
  PID TT      TIME CMD          %MEM
  6075 pts/0    00:00:03 zsh      0.1
14105 pts/0    00:00:00 ps -o pid,tty,time,cmd,%mem  0.0
14106 pts/0    00:00:00 tee memory_usage      0.0
→ Assignment1 git:(master) X

```

40. `env` by executing this command, it displays environment variables

```

→ Assignment1 git:(master) X env
XDG_SEAT_PATH=/org/freedesktop/DisplayManager/Seat0
XDG_CONFIG_DIRS=/etc/xdg/xdg-ubuntu:/etc/xdg
LC_TELEPHONE=uz_UZ.UTF-8
LANG=en_US.UTF-8
DISPLAY=:0
SHLVL=2
LOGNAME=bedilbek
LANGUAGE=en_US
INVOCATION_ID=e5a0a91a14444c13b3634090c26a9ef8
MANDATORY_PATH=/usr/share/gconf/ubuntu.mandatory.path
PWD=/home/bedilbek/IUT Junior Fall/Operating System/Assignments/Assignment1
LC_NAME=uz_UZ.UTF-8
COMPIZ_CONFIG_PROFILE=ubuntu
XAUTHORITY=/home/bedilbek/.xauthority
QT_LINUX_ACCESSIBILITY_ALWAYS_ON=1
JOURNAL_STREAM=8:37790
GTK_IM_MODULE=ibus
COLORTERM=truecolor
GTK2_MODULES=overlay-scrollbar
DESKTOP_SESSION=ubuntu
IM_CONFIG_PHASE=1
XDG_SESSION_DESKTOP=ubuntu
GNOME_DESKTOP_SESSION_ID=this-is-deprecated?
GDMSESSION=ubuntu
DEFAULTS_PATH=/usr/share/gconf/ubuntu.default.path
LC_IDENTIFICATION=uz_UZ.UTF-8
LC_MEASUREMENT=uz_UZ.UTF-8
LC_PAPER=uz_UZ.UTF-8
LC_NUMERIC=uz_UZ.UTF-8
LC_MONETARY=uz_UZ.UTF-8
DBUS_SESSION_BUS_ADDRESS=unix:path=/run/user/1000/bus

```

41. difference between ls -la > file1 and ls -la > file1 2>&1 is if execution of second command throws exception then it will write that error to the file1, however if there is exception in the execution of first command, it will display to the screen, but will not write to the file

```
→ Assignment1 git:(master) X ls -la > file1
→ Assignment1 git:(master) X wc --bytes file1
2849 file1
→ Assignment1 git:(master) X ls -la > file1 2>&1
→ Assignment1 git:(master) X wc --bytes file1
2849 file1:entv... 4
→ Assignment1 git:(master) X █
```

42. first we will display the file with `cat` command, and with `sed` command we will select 8th line, then with `wc` we will count length of line.

```
'sed -n '8 p' listdir | wc --chars'
```

```
→ Assignment1 git:(master) X sed -n '8 p' listdir | wc --chars
59
→ Assignment1 git:(master) X █
```

43. `sed -i '1 d' listdir` to delete 1st line of listdir

```
→ Assignment1 git:(master) X sed -i '1 d' listdir
→ Assignment1 git:(master) X cat listdir
-rw-r--r-- 1 bedilbek bedilbek 34 Okt 6 21:04 Ulugbek
-rw-r--r-- 1 bedilbek bedilbek 299 Okt 6 22:09 sumodd.sh
-rwxr-xr-x 1 bedilbek bedilbek 76 Okt 6 22:09 some_another_file
-rw-r--r-- 1 bedilbek bedilbek 735 Okt 6 22:09 select.sh
drwxr-xr-x 2 bedilbek bedilbek 4096 Okt 7 23:43 screenshots
-rwxr-xr-x 1 bedilbek bedilbek 889 Okt 6 22:09 sample.sh
-rw-r--r-- 1 bedilbek bedilbek 1849 Okt 6 22:10 README.md
-rw-r--r-- 1 bedilbek bedilbek 187 Okt 6 22:09 proc_invok.sh
-rw-r--r-- 1 bedilbek bedilbek 385 Okt 8 17:37 part2q
-rw-r--r-- 1 bedilbek bedilbek 568786 Okt 6 21:04 OS_HOME_ASSIGNMENT_1.pdf
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 8 20:10 nfact.c
-rw-r--r-- 1 bedilbek bedilbek 142 Okt 6 22:09 names -la > file1 and
-rw-r--r-- 1 bedilbek bedilbek 219 Okt 6 22:09 max.sh
-rw-r--r-- 1 bedilbek bedilbek 319 Okt 6 22:09 maxlist.sh
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 8 20:12 listdir
-rw-r--r-- 1 bedilbek bedilbek 107 Okt 6 22:09 len.sh
-rw-r--r-- 1 bedilbek bedilbek 56 Okt 8 15:45 last_lines.sh
-rw-r--r-- 1 bedilbek bedilbek 57 Okt 8 15:43 last_line
-rw-r--r-- 1 bedilbek bedilbek 3821 Okt 7 18:40 infocpu
drwxr-xr-x 2 bedilbek bedilbek 4096 Okt 7 17:33 .idea
-rw-r--r-- 1 bedilbek bedilbek 500484 Okt 6 21:04 HW1.docx
-rw-r--r-- 1 bedilbek bedilbek 68 Okt 6 21:54 .gitignore
drwxr-xr-x 8 bedilbek bedilbek 4096 Okt 8 20:11 .git
-rwxr-xr-x 1 bedilbek bedilbek 691 Okt 6 22:09 fsort.sh
drwxr-xr-x 1 bedilbek bedilbek 228 Okt 6 22:09 flist.sh
-rw-r--r-- 1 bedilbek bedilbek 3323 Okt 6 22:09 file_oper.c
-rwxr-xr-x 1 bedilbek bedilbek 13008 Okt 6 22:09 file_oper
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 6 23:38 fileop.c
-rw-r--r-- 1 bedilbek bedilbek 55 Okt 6 22:09 file
-rwxr-xr-x 1 bedilbek bedilbek 276 Okt 6 22:09 fcount.sh
-rw-r--r-- 1 bedilbek bedilbek 254 Okt 6 22:09 fact.sh
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 8 20:10 core4info
-rw-r--r-- 1 bedilbek bedilbek 0 Okt 8 20:10 core0info
-rwxr-xr-x 1 bedilbek bedilbek 45 Okt 6 22:09 copyto_file
-rw-r--r-- 1 bedilbek bedilbek 105 Okt 6 22:09 copy.sh
-rw-r--r-- 1 bedilbek bedilbek 269 Okt 6 22:09 cfiles.sh
-rwxr-xr-x 1 bedilbek bedilbek 1302 Okt 8 00:01 case.sh
-rw-r--r-- 1 bedilbek bedilbek 175 Okt 8 18:53 Bedilbek
-rw-r--r-- 1 bedilbek bedilbek 8121 Okt 8 19:58 Assignment.md
-rw-r--r-- 1 bedilbek bedilbek 114 Okt 6 22:09 array.sh
-rwxr-xr-x 1 bedilbek bedilbek 76 Okt 6 22:09 alices_file
-rw-r--r-- 1 bedilbek bedilbek 1005 Okt 6 22:07
```

44. `sed -i '\$ d' listdir` to delete last line of listdir

```
→ Assignment1 git:(master) X tail -1 listdir  
total 1212  
→ Assignment1 git:(master) X sed -i '$ d' listdir  
→ Assignment1 git:(master) X tail -1 listdir  
drwxr-xr-x 5 bedilbek bedilbek 4096 Okt 8 20:12 .  
→ Assignment1 git:(master) X
```

Here we see before and after deletion of last line of listdir

45. `sed -n '1 p' part2q | cut -f5 -d " "

Here firstly, we select first line and then display 5th word that is delimited with "

```
→ Assignment1 git:(master) X sed -n '1 p' part2q | cut -f5 -d ''  
THE  
→ Assignment1 git:(master) X
```

Here in the screenshot we can see that 5th word in first line is 'THE'.

46. `sed -n '1 p' part2q | cut -f1 -d ""

Here firstly, we select first line and then display first word that is delimited with "

```
→ Assignment1 git:(master) X sed -n '1 p' part2q | cut -f1 -d ''  
type  
→ Assignment1 git:(master) X
```

Here in the screenshot we can see that first word in first line is 'type'.

47. `sed -n '1 p' part2q | rev | cut -f1 -d "" | rev`

Here firstly, we select first line, then reverse the line, get the first word that is delimited with " and reverse it again.

```
→ Assignment1 git:(master) X sed -n '1 p' part2q | rev | cut -f1 -d '' | rev  
line  
→ Assignment1 git:(master) X
```

Here in the screenshot we can see that last word in first line is 'line'.

48. `echo "WINE Is Not windows Emulator" | rev`

```
→ Assignment1 git:(master) X echo "WINE Is Not windows Emulator" | rev  
rotalumE swodniw toN sI ENIW  
→ Assignment1 git:(master) X
```

49. `sed -i '1,5 d' listdir` to delete from 1-5 lines of listdir

```

→ Assignment1 git:(master) X sed -i '1,5 d' listdir
→ Assignment1 git:(master) X cat listdir
hs.yarra 35:12 8 tko 511 keblideb keblideb 1 --r--r-wr-
ehs.yarra 90:22 6 tko 411 keblideb keblideb 1 --r--r-wr-
dm.tnemngissA 64:22 8 tko 5669 keblideb keblideb 1 --r--r-wr-
keblideB 43:22 8 tko 982 keblideb keblideb 1 --r--r-wr-
hs.esac 10:00 8 tko 2031 keblideb keblideb 1 x-rx-rxwr-
hs.selifc 90:22 6 tko 962 keblideb keblideb 1 --r--r-wr-
hs.ypoc 90:22 6 tko 501 keblideb keblideb 1 --r--r-wr-
elif_otypoc 90:22 6 tko 54 keblideb keblideb 1 x-rx-rxwr-
ofni0eroc 01:02 8 tko 0 keblideb keblideb 1 --r--r-wr-> file1 and
ofni4eroc 01:02 8 tko 0 keblideb keblideb 1 --r--r-wr-length of 8th line
hs.tcaf 90:22 6 tko 452 keblideb keblideb 1 --r--r-wr-
hs.tnuocf 90:22 6 tko 672 keblideb keblideb 1 x-rx-rxwr-
elif 90:22 6 tko 55 keblideb keblideb 1 --r--r-wr-
telif 12:12 8 tko 9482 keblideb keblideb 1 --r--r-wr-
c.poelif 83:32 6 tko 0 keblideb keblideb 1 --r--r-wr-> get 5th word in a
repo_elif 90:22 6 tko 80031 keblideb keblideb 1 x-rx-rxwr-get first word in
c.repo_elif 90:22 6 tko 3233 keblideb keblideb 1 --r--r-wr-
hs.tsilf 90:22 6 tko 822 keblideb keblideb 1 --r--r-wr-> get last word from
hs.trosf 90:22 6 tko 196 keblideb keblideb 1 x-rx-rxwr-linux to reverse a
tig. 64:22 8 tko 6904 keblideb keblideb 8 x-rx-rxwrd
erongitig. 45:12 6 tko 86 keblideb keblideb 1 --r--r-wr-
xcod.1WH 40:12 6 tko 484005 keblideb keblideb 1 --r--r-wr-> delete lines from
aedi. 33:71 7 tko 6904 keblideb keblideb 2 x-rx-rxwrd
upcofni 04:81 7 tko 1283 keblideb keblideb 1 --r--r-wr-
enil_tsal 34:51 8 tko 75 keblideb keblideb 1 --r--r-wr-> place the 5th line
hs.senil_tsal 54:51 8 tko 65 keblideb keblideb 1 --r--r-wr-
hs.nel 90:22 6 tko 701 keblideb keblideb 1 --r--r-wr-
ridtsil 64:22 8 tko 0 keblideb keblideb 1 --r--r-wr-
hs.tsilxam 90:22 6 tko 913 keblideb keblideb 1 --r--r-wr-
hs.xam 90:22 6 tko 912 keblideb keblideb 1 --r--r-wr-> following file test
egasu_yromem 20:12 8 tko 691 keblideb keblideb 1 --r--r-wr-
seman 90:22 6 tko 241 keblideb keblideb 1 --r--r-wr-
c.tcafn 01:02 8 tko 0 keblideb keblideb 1 --r--r-wr-> Description
fdp.1_TNEMNGISSA_EMOH_SO 40:12 6 tko 687865 keblideb keblideb 1 --r--r-wr-> if
q2trap 73:71 8 tko 583 keblideb keblideb 1 --r--r-wr-
hs.kovni_corp 90:22 6 tko 781 keblideb keblideb 1 --r--r-wr-
dm.EMDAER 01:22 6 tko 9481 keblideb keblideb 1 --r--r-wr-
hs.elpmas 90:22 6 tko 988 keblideb keblideb 1 x-rx-rxwr-> character special file
stohsneercs 34:32 7 tko 6904 keblideb keblideb 2 x-rx-rxwrd
hs.tceles 90:22 6 tko 537 keblideb keblideb 1 --r--r-wr-
elif_rehtona_emos 90:22 6 tko 67 keblideb keblideb 1 x-rx-rxwr-> if yes, then
hs.ddomus 90:22 6 tko 992 keblideb keblideb 1 --r--r-wr-> follow down

```

50. `sed -i '15,\$ d' listdir` to delete from 15-till the end lines of listdir

```

→ Assignment1 git:(master) X sed -i '15,$ d' listdir
→ Assignment1 git:(master) X cat listdir
hs.yarra 35:12 8 tko 511 keblideb keblideb 1 --r--r-wr-
ehs.yarra 90:22 6 tko 411 keblideb keblideb 1 --r--r-wr-
dm.tnemngissA 64:22 8 tko 5669 keblideb keblideb 1 --r--r-wr-
keblideB 43:22 8 tko 982 keblideb keblideb 1 --r--r-wr-
hs.esac 10:00 8 tko 2031 keblideb keblideb 1 x-rx-rxwr-
hs.selifc 90:22 6 tko 962 keblideb keblideb 1 --r--r-wr-
hs.ypoc 90:22 6 tko 501 keblideb keblideb 1 --r--r-wr-
elif_otypoc 90:22 6 tko 54 keblideb keblideb 1 x-rx-rxwr-
ofni0eroc 01:02 8 tko 0 keblideb keblideb 1 --r--r-wr-
ofni4eroc 01:02 8 tko 0 keblideb keblideb 1 --r--r-wr-
hs.tcaf 90:22 6 tko 452 keblideb keblideb 1 --r--r-wr-
hs.tnuocf 90:22 6 tko 672 keblideb keblideb 1 x-rx-rxwr-
elif 90:22 6 tko 55 keblideb keblideb 1 --r--r-wr-
t elif 12:12 8 tko 9482 keblideb keblideb 1 --r--r-wr-
→ Assignment1 git:(master) X [ ] Checks if file is an ordinary file

```

#####
#####

2C.

```
ulugbekna@yoga:~/Dropbox/IUT/OS/HW1/repo$ more listdir
hs.yarra 35:12 8 tk0 511 keblideb keblideb 1 --r--r-wr-
ehs.yarra 90:22 6 tk0 411 keblideb keblideb 1 --r--r-wr-
dm.tnemngissA 64:22 8 tk0 5669 keblideb keblideb 1 --r--r-wr-
keblideB 43:22 8 tk0 982 keblideb keblideb 1 --r--r-wr-
hs.esac 10:00 8 tk0 2031 keblideb keblideb 1 x-rx-rxwr-
hs.selifc 90:22 6 tk0 962 keblideb keblideb 1 --r--r-wr-
hs.ypoc 90:22 6 tk0 501 keblideb keblideb 1 --r--r-wr-
elif_otypoc 90:22 6 tk0 54 keblideb keblideb 1 x-rx-rxwr-
ofni0eroc 01:02 8 tk0 0 keblideb keblideb 1 --r--r-wr-
ofni4eroc 01:02 8 tk0 0 keblideb keblideb 1 --r--r-wr-
hs.tcaf 90:22 6 tk0 452 keblideb keblideb 1 --r--r-wr-
hs.tnuocf 90:22 6 tk0 672 keblideb keblideb 1 x-rx-rxwr-
elif 90:22 6 tk0 55 keblideb keblideb 1 --r--r-wr-
1elif 12:12 8 tk0 9482 keblideb keblideb 1 --r--r-wr-
ulugbekna@yoga:~/Dropbox/IUT/OS/HW1/repo$ ./2C.sh
Line 5 replaced
ulugbekna@yoga:~/Dropbox/IUT/OS/HW1/repo$ more listdir
hs.yarra 35:12 8 tk0 511 keblideb keblideb 1 --r--r-wr-
ehs.yarra 90:22 6 tk0 411 keblideb keblideb 1 --r--r-wr-
dm.tnemngissA 64:22 8 tk0 5669 keblideb keblideb 1 --r--r-wr-
keblideB 43:22 8 tk0 982 keblideb keblideb 1 --r--r-wr-
Hi, this new line has been inserted here
hs.selifc 90:22 6 tk0 962 keblideb keblideb 1 --r--r-wr-
hs.ypoc 90:22 6 tk0 501 keblideb keblideb 1 --r--r-wr-
elif_otypoc 90:22 6 tk0 54 keblideb keblideb 1 x-rx-rxwr-
ofni0eroc 01:02 8 tk0 0 keblideb keblideb 1 --r--r-wr-
ofni4eroc 01:02 8 tk0 0 keblideb keblideb 1 --r--r-wr-
hs.tcaf 90:22 6 tk0 452 keblideb keblideb 1 --r--r-wr-
hs.tnuocf 90:22 6 tk0 672 keblideb keblideb 1 x-rx-rxwr-
elif 90:22 6 tk0 55 keblideb keblideb 1 --r--r-wr-
1elif 12:12 8 tk0 9482 keblideb keblideb 1 --r--r-wr-
ulugbekna@yoga:~/Dropbox/IUT/OS/HW1/repo$
```

Replaces 5th line of file listdir if the listdir is present; otherwise, it prints that file does not exist.

2D.

```
ulugbekna@yoga:~/Dropbox/IUT/OS/HW1/repo$ ls
2C.sh    Assignment.md  copyto_file  fcount.sh   flist.sh  len.sh    OS_HOME_ASSIGNMENT_1.pdf  README.md  Shakhobiddin  Tolqinjon_screenshots
2D.sh    case.sh        core4info   file        fsort.sh  maxlist.sh part2q   sample.sh  some_another_file Ulugbek
alices_file cfiles.sh  empty_file  file_oper.c HW_1_384  max.sh    password  Screenshots  sumodd.sh  var.sh
array.sh   copy.sh     fact.sh    file_oper.c HW1.docx  names    proc_invok.sh select.sh
ulugbekna@yoga:~/Dropbox/IUT/OS/HW1/repo$ ./2D.sh
Enter filename:
case.sh
case.sh exists
case.sh is a regular file
case.sh is not an empty file
case.sh is readable
case.sh is writable
case.sh is executable
ulugbekna@yoga:~/Dropbox/IUT/OS/HW1/repo$ ./2D.sh
Enter filename:
Screenshots
Screenshots exists
Screenshots is not an empty file
Screenshots is a directory
Screenshots is writable
Screenshots is executable
ulugbekna@yoga:~/Dropbox/IUT/OS/HW1/repo$ ./2D.sh
Enter filename:
empty_file
empty_file exists
empty_file is a regular file
empty_file is an empty file
empty_file is readable
empty_file is writable
empty_file is executable
ulugbekna@yoga:~/Dropbox/IUT/OS/HW1/repo$ ./2D.sh
Enter filename:
some_nonexisting_filename
File does not exist
```

Checks the file with the input name whether it exists, if it is empty, type of file, read/write/execute access

#####

2E.

(i)

SCRIPT:

```
#!/bin/bash
```

```
echo Enter n:
```

```
read N
```

```
echo Enter $N numbers:
```

```
let K=0
```

```
while [ $K -lt $N ]
```

```
do
```

```
read VAL
```

```
list[$K]="$VAL"
```

```
let K=$K+1
```

```
done
```

```
let MAX=${list[0]}
```

```
let K=1
```

```
while [ $K -lt $N ]
```

```
do
```

```
if [ $MAX -lt ${list[$K]} ]
```

```
then
```

~~```
MAX=${list[$K]}
```~~

```
fi
```

```
let K=$K+1
```

```
done
```

```
echo MAXIMUM ELEMENT HERE IS $MAX
```

(ii) In this script it is almost the same as in the previous script, but it checks for "greater than".

(iii)

SCRIPT:

...Enter values to list...

echo ENTER KEY:

read KEY

let K=0

let INDEX=-1

while [ \$K -lt \$N ]

do

if [ \$KEY -eq \${list[\$K]} ]

then

INDEX=\$K

break

fi

let K=\$K+1

done

if [ \$INDEX -eq -1 ]

then

echo NOT FOUND

else

echo KEY \${list[\$K]} FOUND IN the list

echo ITS position is \$K starting from 0

fi

```

urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$./part2_e_i.sh
Enter n:
5
Enter 5 numbers:
90
34
7657
23
4432
MAXIMUM ELEMENT HERE IS 7657
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$./part2_e_ii.sh
Enter n:
5
Enter 5 numbers:
432
234
65
77
900
MINUMUM ELEMENT HERE IS 65
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$./part2_e_iii.sh
Enter n:
5
Enter 5 numbers:
1234
900
8765
555
66
ENTER KEY:
555
KEY 555 FOUND IN the list
ITS position is 3 starting from 0
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$

```

## 2F.

The command 'sed' was used to substitute.

Scripts:

(i)

```
sed 's/.*/\U&/g'<part2q > part2ql
```

echo Letters IN part2q FILE have been UPPERCASED and stored IN part2ql FILE

(ii)

```
sed 's/.*/\L&/g'< part2q > part2qu
```

echo Letters IN part2q FILE have been lowercased and stored IN part2qu FILE

(iii)

```
cat part2q > part2qr
```

```
sed -i '/commands/ s/the/THE/g' part2qr
sed -i 's/commands/COMMANDS/g' part2qr
```

echo In part2q the lines with word '\commnads\' found and the occurencies with '\the\' IN these lines were UPPERCASED and the words '\commands\' as well.

(iv)

```
cat part2q > part2m
sed -i -e '1 d' part2m
sed -i -e '$ d' part2m
echo First and LAST lines are DELETED from part2m FILES
```

(v)

```
cat part2q part2ql part2qu part2qr part2m > part2qa
echo The contents of part2q part2ql part2qu part2qr part2m FILES were copied and pasted IN part2qa
#####
```

## 2G

In this script to implement the selection menu, 'select' statement was used.

```
#!/bin/bash

OPTIONS='Halt init0 init6 Poweroff Reboot Shutdown'
PS3='Choose an option: '

select CHOICE in $OPTIONS
do
if [$CHOICE == Halt]
then
sudo halt
elif [$CHOICE == init0]
then
sudo init 0
elif [$CHOICE == init6]
then
```

```

sudo init 6

elif [$CHOICE == Poweroff]

then

poweroff

elif [$CHOICE == Reboot]

then

reboot

elif [$CHOICE == Shutdown]

then

shutdown

else echo NO such option

fi

done

```

##There are results during the execution in the screenshot below

```

v@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$./part2_
part2_e_iii.sh part2_e_i.sh part2_f_ii.sh part2_f_iv.sh part2_g.sh
part2_e_ii.sh part2_f_iii.sh part2_f_i.sh part2_f_v.sh
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$./part2_f_i.sh
Letters IN part2q FILE have been UPPERCASED and stored IN part2ql FILE
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$./part2_f_ii.sh
Letters IN part2q FILE have been lowercased and stored IN part2ql FILE
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$./part2_f_iii.sh
In part2q the lines with word 'commads' found and the occurrences with 'the' IN these lines were UPPERCASED and the words 'commands' as
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$./part2_f_iv.sh
First and LAST lines are DELETED from part2n FILES
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$./part2_f_v.sh
The contents of part2q part2ql part2qr part2rn part2m FILES were copied and pasted IN part2qa
urmanov@shakhobiddin-Aspire-4333:~/Desktop/OS_HW_1/OperatingSystemHW1-master$./part2_g.sh
1) Halt
2) init0
3) init6
4) Poweroff
5) Reboot
6) Shutdown
Choose an option: ■

```

## 2H.

CODE

*(\*Program using UNIX I/O primitives to perform file operations with menu driven\*)*

```

#include <stdio.h>

#include <sys/stat.h>

#include <fcntl.h>

#include <unistd.h>

#include <string.h>

```

```
#define DEF_MODE S_IRUSR|S_IWUSR|S_IXUSR|S_IRGRP|S_IWGRP|S_IXGRP|S_IROTH

void createNewFile();
int openExistingFile();
void readFromFile(int fd, int nbytes);
void writeToFile(int fd, int i);
void findInFile(int fd);
void deleteFile();
void renameFile();
void copyFile();

int main()
{
 int option = 1;
 int fd, len;
 char filename[25];
 while (option >= 1 && option <= 9)
 {
 printf("----MENU TO PERFORM FILE OPERATIONS---\n");
 printf("1. Create a new file\n");
 printf("2. Open an existing file\n");
 printf("3. Read from a file\n");
 printf("4. Write to a file\n");
 printf("5. Seek the contents of the opened file\n");
 printf("6. Delete a file\n");
 printf("7. Rename a file\n");
 printf("8. Copy a file\n");
 printf("9. Quit\n");
 printf("Choose an operation (1-9) : ");
 scanf("%d", &option);
 switch(option)
 {
```

```
case 1: createNewFile();
break;

case 2: fd = openExistingFile();
break;

case 3: readFromFile(fd, 0);
break;

case 4: writeToFile(fd, 0);
break;

case 5: findInFile(fd);
break;

case 6: deleteFile();
break;

case 7: renameFile();
break;

case 8: copyFile();
break;

case 9: return 0;

default: printf("Entered wrong option, try again later, PLEASE");
break;
}
}
}
```

HOME ASSIGNMENT 1 INH

```
void createNewFile()
{
int fd,fsize;
char ch=0, buf[512], fname[25], cname[25];
printf("CREATING A NEW FILE WITH ALL ACCESS RIGHTS TO USER AND GROUP AND NO EXECUTE ACCESS
TO OTHERS\n");
printf("ENTER FILE NAME : ");
scanf("%s", fname);
fd = open(fname, O_CREAT|O_TRUNC|O_WRONLY|O_APPEND, DEF_MODE);
```

```

if (fd < 0)
printf ("cannot create FILE %s \n", fname);
else
{
printf("FILE %s CREATED", fname);
close(fd);
}
printf("\n\n");
}

int openExistingFile()
{
/***
TODO: complete
**/

int fd, option, mode;
char ch=0, cf, buf[512], fname[25], cname[25];

printf("OPENING AN EXISTING FILE\n");
printf("ENTER FILE NAME : ");
scanf("%s", fname);
printf("PLEASE CHOOSE THE MODE: \n");
printf("1.READ ONLY; 2.WRITE ONLY WITH APPEND; 3.READ & WRITE WITH APPEND : ");
scanf("%d", &option);

switch(option)
{
case 1: mode = O_RDONLY;
break;
case 2: mode = O_WRONLY|O_APPEND;
}

```

```
break;

case 3: mode = O_RDWR|O_APPEND;
break;

default: printf("Please choose correct mode! \n");
break;

}

fd = open(fname, mode, DEF_MODE);

if (fd < 0)

printf ("cannot open FILE %s - does not exist \n", fname);

else

printf("File %s opened\n\n", fname);

return fd;

}
```

```
void readFromFile(int fd, int nbytes)

{

int offset;

char buf[512];

printf("HOW MANY BYTES YOU WANT TO READ, IF TILL THE END, ENTER -1 : ");

scanf("%d", &offset);

if (fd < 0)

printf ("cannot open FILE does not exist \n");

else

{

int len;

read(fd,buf,sizeof(buf));

if (offset == -1) {

len = 512;

}

else {

if (nbytes != 0)
```

```
len = offset + nbytes;
else len = offset;
}

for (int i = nbytes; i < len; i++)
{
if (buf[i] == '\0')
break;
printf("%c", buf[i]);
}
}
printf("\n\n");
}

void writeToFile(int fd, int i)
{
char ch=0, buf[512];
printf("WRITING TO AN EXISTING FILE\n");
if (fd < 0)
printf ("Cannot open a FILE for writing \n");
else if (i >=512)
printf ("Cannot write to a file, range exceeded \n");
else
{
printf("NOW ENTER YOUR PROGRAM OR TEXT LINE BY LINE- ONCE YOU FINISH PRESS KEYS Ctrl D together\n");
ch=getchar();
/* to remove the last newline character entered*/
while((ch=getchar()) != EOF)
buf[i++]=ch;
buf[i]='\0';
printf("\nTotal characters stored in your file = %d\n", i);
write(fd, buf, i);
```

```

}

printf("\n\n");

}

void findInFile(int fd)

{
/**

TODO: complete

**/

int nbytes, option;

printf("SEEKING THE CONTENTS FROM AN EXISTING FILE\n");

printf("HOW MANY BYTES YOU WANT TO BE SKIPPED, TO GO TO THE END, ENTER -1: ");

scanf("%d", &nbytes);

if (fd < 0)

printf ("Cannot open FILE - does not exist \n");

else if (nbytes < 0)

printf("Entered wrong parameters for seeking, try again with different values\n");

else

{

printf("What kind of operation you want? 1.READ; 2.WRITE : ");

scanf("%d", &option);

if (option == 1) {

readFromFile(fd, nbytes);

}

else if (option == 2)

{

writeToFile(fd, nbytes);

}

else {

printf("Wrong option has been chosen, please try again with different value\n");

}

```

```

}

printf("\n\n");

}

void deleteFile()

{
char cf, fname[25];

printf("DELETING A FILE \n");
printf("ENTER FILE NAME :");
scanf("%s", fname);

getchar(); /* to remove the last newline character entered*/
printf("PLEASE CONFIRM -SURE YOU WANT TO DELETEPRESS y/n :");
scanf("%c", &cf);

if (cf == 'y')

{
unlink(fname);

printf("FILE %s deleted OK.....\n", fname);
}

else

printf("FILE %s not deleted OK.....\n", fname);

printf("\n\n");
}

void renameFile()

{
char fname[25], cname[25];

printf("RENAMING A FILE \n");

printf("ENTER CURRENT FILE NAME :");

scanf("%s", fname);

printf("ENTER NEW FILE NAME :");

scanf("%s", cname);

printf("FILE %s has been renamed to %s OK.....\n", fname, cname);
}

```

```

rename(fname, cname);

printf("\n\n");

}

void copyFile()
{
int fd, fd1, len;
char buf[512], fname[25], cname[25];

printf("COPYING A FILE \n");
printf("ENTER NAME OF CURRENT FILE TO BE COPIED FROM :");
scanf("%s", fname);
printf("ENTER NAME OF NEW FILE NAME TO BE COPIED TO :");
scanf("%s", cname);
fd = open(fname, O_RDONLY, DEF_MODE);
if (fd < 0)
printf ("cannot open FILE %s - does not exist \n", fname);
else
{
if(read(fd, buf, sizeof(buf)) <0)
printf("FILE READ ERROR\n");
else
{
fd1 = open(cname, O_CREAT|O_TRUNC|O_WRONLY, DEF_MODE);
if (fd1 < 0)
printf("Cannot create New file %s\n", cname);
else
{
len=strlen(buf);
if(write(fd1, buf, len) < 0)
printf("FILE WRITE ERROR\n");
else
}
}
}
}

```

```

printf("FILE %s has been copied to %s successfully OK \n", fname, cname);

close(fd1);

}

close(fd);

}

printf("\n\n");

}

```

```

→ Assignment1 git:(master) X gcc 2H_file_manipulations.c -o 2H
→ Assignment1 git:(master) X ./2H
----MENU TO PERFORM FILE OPERATIONS---- Tools VCS Window DB Navigator Help
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 1
CREATING A NEW FILE WITH ALL ACCESS RIGHTS TO USER AND GROUP AND NO EXECUTE ACCESS TO OTHERS
ENTER FILE NAME : newFile
FILE newFile CREATED

----MENU TO PERFORM FILE OPERATIONS----
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 2
OPENING AN EXISTING FILE
ENTER FILE NAME : newFile
PLEASE CHOOSE THE MODE.
1.READ ONLY; 2.WRITE ONLY WITH APPEND; 3.READ & WRITE WITH APPEND : 3
File newFile opened

```

Here from the menu of our program we choose 1st option to create new File.

After completing the given steps we see the message that new File created

Then after completing file operation, again menu is shown

In this part, we will open the file

We choose the option 2 to open the newFile

After completing the given steps we see the message that newfile is opened

```

----MENU TO PERFORM FILE OPERATIONS---
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 4
WRITING TO AN EXISTING FILE
NOW ENTER YOUR PROGRAM OR TEXT LINE BY LINE- ONCE YOU FINISH PRESS KEYS Ctrl D together
It is my first Program written in c in this semester!
Total characters stored in your file = 53

----MENU TO PERFORM FILE OPERATIONS---
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 2
OPENING AN EXISTING FILE
ENTER FILE NAME : newFile
PLEASE CHOOSE THE MODE:
1.READ ONLY; 2.WRITE ONLY WITH APPEND; 3.READ & WRITE WITH APPEND : 1
File newFile opened

```

Here by choosing the option 4 to write to opened file.

We write the text and blue underlined text is that we have written. after finishing the writing press ^D to stop

we see the message that text is written into the file

Now to check whether the changes to file is made, we will reopen the file by choosing the option 2.

```

----MENU TO PERFORM FILE OPERATIONS---
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 3
FROM AN EXISTING FILE (1)
HOW MANY BYTES YOU WANT TO READ, IF TILL THE END, ENTER -1 : -1
It is my first Program written in c in this semester!

```

We choose the option 3 to read the opened file.

From the blue underlined text that changes were made to file and it has read the file where we wrote.

```
---MENU TO PERFORM FILE OPERATIONS---
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 5
SEEKING THE CONTENTS FROM AN EXISTING FILE
HOW MANY BYTES YOU WANT TO TO BE SKIPPED, TO GO TO THE END, ENTER -1: 5
What kind of operation you want? 1.READ: 2.WRITE : 1
HOW MANY BYTES YOU WANT TO READ, IF TILL THE END, ENTER -1 : 3
my
printf("What kind of operation you want? 1.READ, 2.WRITE : ");
```

Now we will try to seek from a file and read it.

We choose the option 5 to seek from the opened file.

We choose how many bytes should be skipped inside the file. 5 bytes skipping is chosen.

We choose what operation we will do, 1st option to read the file.

We choose we want to read 3 bytes from the file.

We have been messaged with blue underlined text which represents reading file from 5 bytes till 8 bytes.

```
---MENU TO PERFORM FILE OPERATIONS---
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 5
SEEKING THE CONTENTS FROM AN EXISTING FILE
HOW MANY BYTES YOU WANT TO TO BE SKIPPED, TO GO TO THE END, ENTER -1: 2
What kind of operation you want? 1.READ; 2.WRITE : 2
WRITING TO AN EXISTING FILE
NOW ENTER YOUR PROGRAM OR TEXT LINE BY LINE- ONCE YOU FINISH PRESS KEYS Ctrl D together
SORRY THIS IS MY FAULT
Total characters stored in your file = 24
option = readFromFile(fd, nbytes);
```

Now we will try to seek from a file and write into it.

We choose the option 5 to seek from the opened file.

We choose how many bytes should be skipped inside the file. 2 bytes skipping is chosen.

We choose what operation we will do, 2st option to write into the file.

We write the text we want, and to finish we press ^D.

We have been messaged in the last file that 24 bytes totals characters are stored into file.

```
----MENU TO PERFORM FILE OPERATIONS----
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 3
HOW MANY BYTES YOU WANT TO READ, IF TILL THE END, ENTER -1 : -1
It is my first Program written in c in this semester! SORRY THIS IS MY FAULT
```

Now we will see the changes that we have made to file.

We choose the option 3 to read from the file

From last blue underlined text we can see what we wrote into file

```
----MENU TO PERFORM FILE OPERATIONS----
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 6
DELETING A FILE
ENTER FILE NAME :newFile
PLEASE CONFIRM -SURE YOU WANT TO DELETEPRESS y/n : y
FILE newFile deleted OK.....

----MENU TO PERFORM FILE OPERATIONS----
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 2
OPENING AN EXISTING FILE
ENTER FILE NAME : newFile
PLEASE CHOOSE THE MODE:
1.READ ONLY; 2.WRITE ONLY WITH APPEND; 3.READ & WRITE WITH APPEND [1]
cannot open FILE newFile - does not exist
```

Now we delete file by choosing the option 6

we see the message that file is deleted

We check by opening the file with option 2

We see that file cannot be opened

```
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 1
CREATING A NEW FILE WITH ALL ACCESS RIGHTS TO USER AND GROUP AND NO EXECUTE ACCESS TO OTHERS
ENTER FILE NAME : newNewFile
FILE newNewFile Created

----MENU TO PERFORM FILE OPERATIONS----
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 7
RENAMING A FILE
ENTER CURRENT FILE NAME :newNewFile
ENTER NEW FILE NAME :JustNewFile
FILE newNewFile has been renamed to JustNewFile OK.....
```

Now we rename the file.

First we will create file newNewFile by choosing the option 1.

Second, rename the file to JustNewFile by choosing the option 7.

```
----MENU TO PERFORM FILE OPERATIONS----
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 4
WRITING TO AN EXISTING FILE
NOW ENTER YOUR PROGRAM OR TEXT LINE BY LINE- ONCE YOU FINISH PRESS KEYS Ctrl D together
THIS FILE FOR COPYING

Total characters stored in your file = 22

----MENU TO PERFORM FILE OPERATIONS----
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 8
COPYING A FILE
ENTER NAME OF CURRENT FILE TO BE COPIED FROM :JustNewFile
ENTER NAME OF NEW FILE NAME TO BE COPIED TO :CopiedFile
FILE JustNewFile has been copied to CopiedFile successfully OK
```

First we will write to a file text to copy it to other new file.

In the end we see that file has been copied to other file.

```
----MENU TO PERFORM FILE OPERATIONS----
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 2
OPENING AN EXISTING FILE
ENTER FILE NAME : CopiedFile
PLEASE CHOOSE THE MODE:
1.READ ONLY; 2.WRITE ONLY WITH APPEND; 3.READ & WRITE WITH APPEND : 3
File CopiedFile opened

----MENU TO PERFORM FILE OPERATIONS----
1. Create a new file
2. Open an existing file
3. Read from a file
4. Write to a file
5. Seek the contents of the opened file
6. Delete a file
7. Rename a file
8. Copy a file
9. Quit
Choose an operation (1-9) : 3
HOW MANY BYTES YOU WANT TO READ, IF TILL THE END, ENTER -1 : -1
THIS FILE FOR COPYING
```

If we open and read the file we see that file has been copied and all the text inside also has been copied to that file.

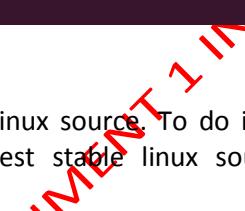
#####
#####

## PART 3: Linux Kernel Source Code Installation

### 3A.

All commands are executed in In Ubuntu Linux Distribution. In current time latest stable source version is 4.10.0. In this document we used “[version]” instead of “4.10.0”

To install linux source first we should update package list by executing command “sudo apt-get update”. It downloads the package lists from the repositories and "updates" them to get information on the newest versions of packages and their dependencies. It will do this for all repositories

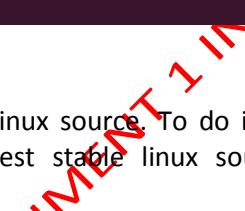


```

Terminal File Edit View Search Terminal Help
sherezod@sherezod:~$ pwd
/home/sherezod
sherezod@sherezod:~$ sudo apt-get update
[sudo] password for sherezod:
Ign:1 http://ppa.launchpad.net/colingille/freshlight/ubuntu zesty InRelease
Ign:2 http://dl.google.com/linux/chrome/deb stable InRelease
Hit:3 http://ppa.launchpad.net/gezakovacs/ppa/ubuntu zesty InRelease
Get:4 http://dl.google.com/linux/chrome/deb stable Release [1,189 B]
Hit:6 http://ppa.launchpad.net/nilarimogard/webupd8/ubuntu zesty InRelease
Ign:7 http://ppa.launchpad.net/colingille/freshlight/ubuntu zesty Release
Ign:8 http://ppa.launchpad.net/colingille/freshlight/ubuntu zesty/main amd64 Packages
Hit:9 http://ubuntu.snet.uz/ubuntu zesty InRelease
Ign:10 http://ppa.launchpad.net/colingille/freshlight/ubuntu zesty/main i386 Packages
Get:11 http://ubuntu.snet.uz/ubuntu zesty-updates InRelease [89.2 kB]
Get:12 http://ubuntu.snet.uz/ubuntu zesty-backports InRelease [89.2 kB]
Get:13 http://ubuntu.snet.uz/ubuntu zesty-security InRelease [89.2 kB]
Ign:14 http://ppa.launchpad.net/colingille/freshlight/ubuntu zesty/main all Packages
Ign:15 http://ppa.launchpad.net/colingille/freshlight/ubuntu zesty/main Translation-en
Ign:16 http://ppa.launchpad.net/colingille/freshlight/ubuntu zesty/main Translation-en US

```

After updating we can start installing linux source. To do it, we execute “sudo apt-get install linux-source” it downloads tar archived latest stable linux source code from internet and stores to “usr/src/linux-source-[version]”.



```

Terminal File Edit View Search Terminal Help
sherezod@sherezod:~$ sudo apt-get install linux-source
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
 linux-source-4.10.0
Suggested packages:
 libncurses-dev | ncurses-dev kernel-package libqt3-dev
The following NEW packages will be installed:
 linux-source linux-source-4.10.0
0 upgraded, 2 newly installed, 0 to remove and 278 not upgraded.
Need to get 118 MB of archives.
After this operation, 133 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ubuntu.snet.uz/ubuntu zesty-updates/main amd64 linux-source-4.10.0 all 4.10.0-35.39 [118 MB]
0% [1 linux-source-4.10.0 39.8 kB/118 MB] 0% [it was halted while executing, leaving a 6,636 B/s 4h 55min 34s]
state.- bouke Sep 13 '12 at 12:15
 I would accept this as the best answer. correct one. - Anwar Apr 6 '13 at 14:37
 @AnwarShah no, there are other considerations before going around removing files of the system. - Braiam Dec 31 '13 at 14:47
 rm /var/lib/dpkg/lock; dpkg --configure -a; - WitchCraft Jan 15 '14 at 15:07

```

Because the source code is compressed we need to uncompress it using “tar xvzf usr/src/linux-source-[version]/ linux-source-[version].tar.bz2” command. The “tar” program is used to create, maintain,

modify, and extract files that are archived in the tar format. The “xvf” is argument for tar program, argument’s first letter is function, where:

x – to extract all files from archive

v – to operate in verbosely

j – this option tells tar to read or write archives using the bzip2 compressor

f – use archive file

The program extracts all linux source archive located in “usr/src/linux-source-[version]/ linux-source-[version].tar.bz2” to “home/user” directory

A screenshot of a terminal window titled "Terminal". The command entered is "tar xvjf /usr/src/linux-source-4.10.0/linux-source-4.10.0.tar.bz2". The terminal shows a list of extracted files, primarily header files from the Linux kernel source code, such as "linux-source-4.10.0/spl/include/sys/types32.h", "linux-source-4.10.0/spl/include/sys/fm/", and "linux-source-4.10.0/spl/include/sys/fm/Makefile.am". A red arrow points from the text "2011" to the top right corner of the terminal window.

A screenshot of a terminal window titled "Terminal". The user has navigated to the extracted directory with the command "cd linux-source-4.10.0". The command "ls" is run to list the contents, which include various kernel modules like "arch", "block", "crypto", "fs", "Kconfig", "kernel", "lib", "Documentation", "drivers", "init", "ipc", "samples", "spl", "scripts", "sound", "MAINTAINERS", "firmware", "Kbuild", "Makefile", "README", "snapcraft.yaml", "Ubuntu", "usr", "virt", "zfs", "COPYING", "dropped.txt", "CREDITS", and "firmware". A red arrow points from the text "2011" to the top right corner of the terminal window.

## Linux source installation summary steps:

```
#updates packages list
#downloads linux source archive
#unarchive tar file
```

```
$sudo apt-get update
$sudo apt-get install linux-source
$tar xvif usr/src/linux-source-4.10.0/ linux-source-4.10.0.tar.bz2
```

3B

Here is the complete Linux kernel source directory tree in pdf:

[File: 3B/Linux Kernel Source Directory Tree.pdf]

Here is complete linux source code files:

[File: 3B/Linux Kernel Source Files.docx]

Here are screenshots of commands:

```
Terminal File Edit View Search Terminal Help
sherzod@sherzod:/media/sherzod/Data/Kernel/linux-source-4.10.0$ ls -R >> files
sherzod@sherzod:/media/sherzod/Data/Kernel/linux-source-4.10.0$ tree -d
.
├── arch
│ ├── alpha
│ ├── boot
│ │ └── tools
│ ├── include
│ │ ├── asm
│ │ └── uapi
│ │ └── asm
│ ├── kernel
│ ├── lib
│ ├── mm
│ ├── net
│ ├── samples
│ └── scripts
└── Documentation
```

## PART 4: Linux Kernel Source Code Compilation

4A.

Compilation have done. Details are in 4b

4B.

In order to compile installed linux source we need first install “libncurses5” and “libncurses5-dev”. “libncurses5” this package contains the shared libraries necessary to run programs compiled with ncurses. “libncurses5-dev” this package contains the header files, static libraries and symbolic links that developers using ncurses will need. To do this you need to execute “\$sudo apt-get install libncurses5 libncurses5-dev”.

After we need to configure linux source, in which we can choose which features to include in our source. To do this “make menuconfig” is executed. It is a menu-driven user interface, allows the user to choose the features of Linux (and other options) that will be compiled. After configuring source we will save it. For simplicity here I left default options. Then packages list is updated by “\$sudo apt-get update”.

```
Terminal File Edit View Search Terminal Help
sherzod@sherzod:~/linux-source-4.10.0$ make menuconfig
HOSTCC scripts/basic/fixdep
HOSTCC scripts/kconfig/mconf.o
SHIPPED scripts/kconfig/zconf.tab.c
SHIPPED scripts/kconfig/zconf.lex.c
SHIPPED scripts/kconfig/zconf.hash.c
HOSTCC scripts/kconfig/zconf.tab.o
HOSTCC scripts/kconfig/lxdialog/checklist.o
HOSTCC scripts/kconfig/lxdialog/util.o
HOSTCC scripts/kconfig/lxdialog/inputbox.o
HOSTCC scripts/kconfig/lxdialog/textbox.o
HOSTCC scripts/kconfig/lxdialog/yesno.o
HOSTCC scripts/kconfig/lxdialog/menubox.o
HOSTLD scripts/kconfig/mconf
scripts/kconfig/mconf Kconfig
```

```
Terminal File Edit View Search Terminal Help
.config - Linux/x86 4.10.17 Kernel Configuration
CONFIG_64BIT:
Say yes to build a 64-bit kernel - formerly known as x86_64
Say no to build a 32-bit kernel - formerly known as i386
Symbol: 64BIT [=y]
Type : boolean
Prompt: 64-bit kernel
Defined at arch/x86/Kconfig:2
```

The next step is to install “libssl-dev” package which contains development libraries, header files, and manpages for libssl and libcrypto. This package is part of the OpenSSL project's implementation of the SSL and TLS cryptographic protocols for secure communication over the Internet. It is done by using “\$sudo apt-get install libssl-dev”.

```
Terminal File Edit View Search Terminal Help
sherzod@sherzod:~/linux-source-4.10.0$ sudo apt-get update && sudo apt-get install libssl-dev
Ign:1 http://ppa.launchpad.net/colingille/freshlight/ubuntu zesty InRelease
Hit:2 http://ubuntu.snet.uz/ubuntu zesty InRelease
Get:3 http://ubuntu.snet.uz/ubuntu zesty-updates InRelease [89.2 kB]
Hit:4 http://ppa.launchpad.net/gezakovacs/ppa/ubuntu zesty InRelease
Get:5 http://ubuntu.snet.uz/ubuntu zesty-backports InRelease [89.2 kB]
Hit:6 http://ppa.launchpad.net/nilarimogard/webupd8/ubuntu zesty InRelease
Get:7 http://ubuntu.snet.uz/ubuntu zesty-security InRelease [89.2 kB]
Get:8 http://ubuntu.snet.uz/ubuntu zesty-updates/main amd64 Packages [224 kB]
Ign:9 http://ppa.launchpad.net/colingille/freshlight/ubuntu zesty Release
Ign:10 http://dl.google.com/linux/chrome/deb stable InRelease
Get:11 http://ubuntu.snet.uz/ubuntu zesty-updates/main i386 Packages [221 kB]
Ign:12 http://ppa.launchpad.net/colingille/freshlight/ubuntu zesty/main all Packages
Ign:13 http://ppa.launchpad.net/colingille/freshlight/ubuntu zesty/main i386 Packages
```

The final step before compilation is to execute “\$make clean” command. “\$make clean” is something you do before recompiling, to make sure you get a clean build and don't have left-over by-products from previous runs.

```
Terminal File Edit View Search Terminal Help
sherzod@sherzod:~/linux-source-4.10.0$ make clean
sherzod@sherzod:~/linux-source-4.10.0$
```

The final step is to compile and install kernel and modules using “\$make deb-pkg”. The “make deb-pkg” command will create five deb packages in .. that you will need to install with “\$dpkg -i linux-\*.deb”.

```
Terminal File Edit View Search Terminal Help
sherzod@sherzod:~/linux-source-4.10.0$ make clean
sherzod@sherzod:~/linux-source-4.10.0$ make deb-pkg
 CHK include/config/kernel.release
make clean
 TAR linux-4.10.17.tar.gz
ln: '.' and 'linux-4.10.17/.' are the same file
make KBUILD_SRC=
 SYSTBL arch/x86/entry/syscalls/.../include/generated/asm/syscalls_32.h
 SYSHDR arch/x86/entry/syscalls/.../include/generated/asm/unistd_32_ia32.h
 SYSHDR arch/x86/entry/syscalls/.../include/generated/asm/unistd_64_x32.h
 SYSTBL arch/x86/entry/syscalls/.../include/generated/asm/syscalls_64.h
 HYPERCALLS arch/x86/entry/syscalls/.../include/generated/asm/xen-hypercalls.h
 SYSHDR arch/x86/entry/syscalls/.../include/generated/uapi/asm/unistd_32.h
 SYSHDR arch/x86/entry/syscalls/.../include/generated/uapi/asm/unistd_64.h
 SYSHDR arch/x86/entry/syscalls/.../include/generated/uapi/asm/unistd_x32.h
 HOSTCC scripts/basic/fixdep
 HOSTCC scripts/basic/bin2c
 HOSTCC arch/x86/tools/relocs_32.o Lecture Slides on SOC 3100 OPERATING SYSTEMS
 HOSTCC arch/x86/tools/relocs_64.o Fall Semester 2017 @ Dr A R Naseer
 HOSTCC arch/x86/tools/relocs_common.o
 HOSTLD arch/x86/tools/relocs
 CHK include/config/kernel.release
 WRAP arch/x86/include/generated/asm/clkdev.h
 WRAP arch/x86/include/generated/asm/cputime.h
 WRAP arch/x86/include/generated/asm/dma-contiguous.h
 WRAP arch/x86/include/generated/asm/early_toremap.h
 WRAP arch/x86/include/generated/asm/mcs_spinlock.h
```

```
Terminal File Edit View Search Terminal Help
libssl1.0.0
1 upgraded, 3 newly installed, 0 to remove and 124 not upgraded.
Need to get 3,667 kB of archives.
After this operation, 10.5 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ubuntu.snet.uz/ubuntu zesty-updates/main amd64 libssl1.0.0 amd64 1.0.2g-1ubuntu11.2 [1,081 kB]
Get:2 http://ubuntu.snet.uz/ubuntu zesty/main amd64 zlib1g-dev amd64 1:1.2.11.dfsg-0ubuntu1 [173 kB]
Get:3 http://ubuntu.snet.uz/ubuntu zesty-updates/main amd64 libssl-dev amd64 1.0.2g-1ubuntu11.2 [1,352 kB]
Get:4 http://ubuntu.snet.uz/ubuntu zesty-updates/main amd64 libssl-doc all 1.0.2g-1ubuntu11.2 [1,062 kB]
Fetched 3,667 kB in 4s (818 kB/s)
Preconfiguring packages ...
(Reading database ... 204409 files and directories currently installed.)
Preparing to unpack .../libssl1.0.0_1.0.2g-1ubuntu11.2_amd64.deb ...
Unpacking libssl1.0.0:amd64 (1.0.2g-1ubuntu11.2) over (1.0.2g-1ubuntu11) ...
Selecting previously unselected package zlib1g-dev:amd64.
Preparing to unpack .../zlib1g-dev_1%3a1.2.11.dfsg-0ubuntu1_amd64.deb ...
Unpacking zlib1g-dev:amd64 (1:1.2.11.dfsg-0ubuntu1) ...
Selecting previously unselected package libssl-dev:amd64.
Preparing to unpack .../libssl-dev_1.0.2g-1ubuntu11.2_amd64.deb ...
Unpacking libssl-dev:amd64 (1.0.2g-1ubuntu11.2) ...
Selecting previously unselected package libssl-doc.
Preparing to unpack .../libssl-doc_1.0.2g-1ubuntu11.2_all.deb ...
Unpacking libssl-doc (1.0.2g-1ubuntu11.2) ...
Processing triggers for libc-bin (2.24-9ubuntu2.2) ...
Processing triggers for man-db (2.7.6.1-2) ...
Setting up libssl-doc (1.0.2g-1ubuntu11.2) ...
Setting up libssl1.0.0:amd64 (1.0.2g-1ubuntu11.2) ...
Setting up zlib1g-dev:amd64 (1:1.2.11.dfsg-0ubuntu1) ...
Setting up libssl-dev:amd64 (1.0.2g-1ubuntu11.2) ...
shерзод@sherzод:~/linux-source-4.10.0$
```

```

Terminal File Edit View Search Terminal Help
CC arch/x86/boot/memory.o
CC arch/x86/boot/pm.o
AS arch/x86/boot/pmjump.o
CC arch/x86/boot/printf.o
CC arch/x86/boot/regs.o
CC arch/x86/boot/string.o
CC arch/x86/boot/tty.o
CC arch/x86/boot/video.o
CC arch/x86/boot/video-mode.o
CC arch/x86/boot/version.o
CC arch/x86/boot/video-vga.o
CC arch/x86/boot/video-vesa.o
CC arch/x86/boot/video-bios.o
LD arch/x86/boot/setup.elf
OBJCOPY arch/x86/boot/setup.bin
OBJCOPY arch/x86/boot/vmlinux.bin
HOSTCC arch/x86/boot/tools/build
BUILD arch/x86/boot/bzImage
Setup is 17340 bytes (padded to 17408 bytes).
System is 7385 kB
CRC e36bd6ed
Kernel: arch/x86/boot/bzImage is ready (#1)
Building modules, stage 2.
MODPOST 4939 modules
arch/x86/events/core.o
CC arch/x86/events/amd/core.o
dpkg-deb: building package 'linux-firmware-image-4.10.17' in '../linux-firmware-image-4.10.17_4.10.17-1_amd64.deb'.
dpkg-deb: building package 'linux-headers-4.10.17' in '../linux-headers-4.10.17_4.10.17-1_amd64.deb'.
dpkg-deb: building package 'linux-libc-dev' in '../linux-libc-dev_4.10.17-1_amd64.deb'.
dpkg-deb: building package 'linux-image-4.10.17' in '../linux-image-4.10.17_4.10.17-1_amd64.deb'.
dpkg-deb: building package 'linux-image-4.10.17-dbg' in '../linux-image-4.10.17_4.10.17-1_amd64.deb'.
dpkg-source: info: using source format '3.0 (custom)'.
dpkg-source: info: building linux-4.10.17 in linux-4.10.17_4.10.17-1.dsc
dpkg-genchanges: info: including full source code in upload
sherzod@sherzod:/media/sherzod/Data/Ubuntu/linux-source-4.10.0$

```

```

Terminal File Edit View Search Terminal Help
sherzod@sherzod:/media/sherzod/Data/Ubuntu$ ls
linux-4.10.17_4.10.17-1_amd64.changes
linux-4.10.17_4.10.17-1.debian.tar.gz
linux-4.10.17_4.10.17-1.dsc
linux-4.10.17_4.10.17.orig.tar.gz
linux-firmware-image-4.10.17_4.10.17-1_amd64.deb
linux-headers-4.10.17_4.10.17-1_amd64.deb
linux-image-4.10.17_4.10.17-1_amd64.deb
linux-image-4.10.17-dbg_4.10.17-1_amd64.deb
linux-libc-dev_4.10.17-1_amd64.deb
linux-source-4.10.0
sherzod@sherzod:/media/sherzod/Data/Ubuntu$

```

#####
#####  
soc320-os NO

## 4C.

To test you will install compiled “.deb” files from source with “\$dpkg -i linux-\*.deb”. After you can reboot to new kernel.

```
Terminal File Edit View Search Terminal Help
sherzod@sherzod:/media/sherzod/Data/Ubuntu$ ls *.deb
linux-firmware-image-4.10.17_4.10.17-1_amd64.deb
linux-headers-4.10.17_4.10.17-1_amd64.deb
linux-image-4.10.17_4.10.17-1_amd64.deb
linux-image-4.10.17-dbg_4.10.17-1_amd64.deb
linux-libc-dev_4.10.17-1_amd64.deb
sherzod@sherzod:/media/sherzod/Data/Ubuntu$ sudo dpkg -i linux*4.10.17_4.10.17-1*.deb
[sudo] password for sherzod:
Selecting previously unselected package linux-firmware-image-4.10.17.
(Reading database ... 206199 files and directories currently installed.)
Preparing to unpack linux-firmware-image-4.10.17_4.10.17-1_amd64.deb ...
Unpacking linux-firmware-image-4.10.17 (4.10.17-1) ...
Selecting previously unselected package linux-headers-4.10.17.
Preparing to unpack linux-headers-4.10.17_4.10.17-1_amd64.deb ...
Unpacking linux-headers-4.10.17 (4.10.17-1) ...
Selecting previously unselected package linux-image-4.10.17.
Preparing to unpack linux-image-4.10.17_4.10.17-1_amd64.deb ...
Unpacking linux-image-4.10.17 (4.10.17-1) ...
Setting up linux-firmware-image-4.10.17 (4.10.17-1) ...
Setting up linux-headers-4.10.17 (4.10.17-1) ...
Setting up linux-image-4.10.17 (4.10.17-1) ...
update-initramfs: Generating /boot/initrd.img-4.10.17
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-4.10.17
Found initrd image: /boot/initrd.img-4.10.17
Found linux image: /boot/vmlinuz-4.10.0-35-generic
Found initrd image: /boot/initrd.img-4.10.0-35-generic
Found linux image: /boot/vmlinuz-4.10.0-19-generic
Found initrd image: /boot/initrd.img-4.10.0-19-generic
```

```
Terminal File Edit View Search Terminal Help
sherzod@sherzod:~$ uname -a
Linux sherzod 4.10.0-19-generic #21-Ubuntu SMP Thu Apr 6 17:04:57 UTC 2017 x86_64
4 x86_64 x86_64 GNU/Linux
sherzod@sherzod:~$
```

SOC 3010-OS HOME ASSIGNMENT  
INIV 2017