

LAPORAN PRAKTIKUM II

SISTEM OPERASI – E



Kelompok E04:

Cahya Setya Adhi – 5114100049


Destiana Nurliasari – 5114100148

1. Cara menggunakan Git:

- git clone address:

Mengclone public repository pada address ke komputer.

Contoh:

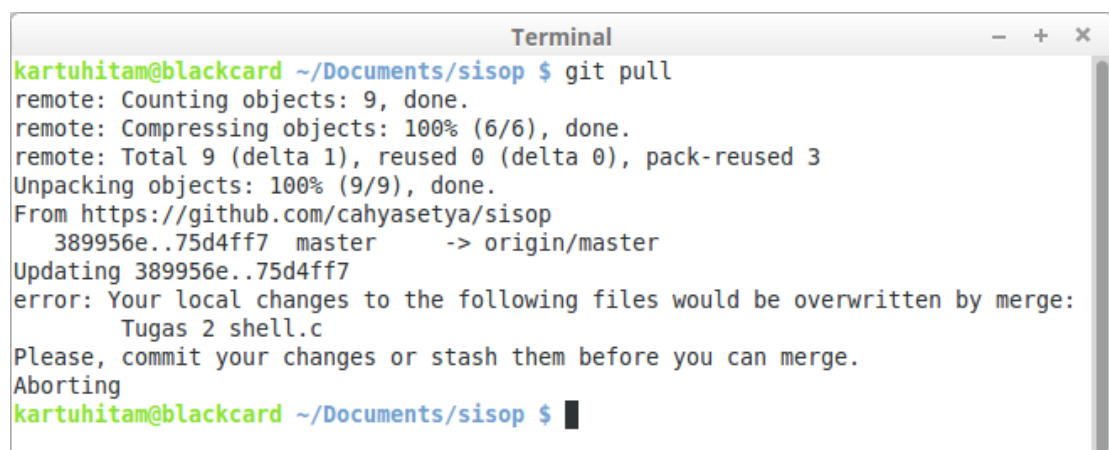
A terminal window titled "Terminal" with standard window controls. The prompt is "kartu hitam@blackcard ~/Documents \$". The command "git clone https://github.com/dns-148/Pribadi.git" is entered. The output shows the cloning process: "Cloning into 'Pribadi'...", "remote: Counting objects: 3, done.", "remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0", "Unpacking objects: 100% (3/3), done.", and "Checking connectivity... done.". The prompt returns to "kartu hitam@blackcard ~/Documents \$".

```
Terminal
kartu hitam@blackcard ~/Documents $ git clone https://github.com/dns-148/Pribadi.git
git
Cloning into 'Pribadi'...
remote: Counting objects: 3, done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), done.
Checking connectivity... done.
kartu hitam@blackcard ~/Documents $
```

- git pull

Mendownload perubahan terbaru dari repository public ke repository local.

Contoh :

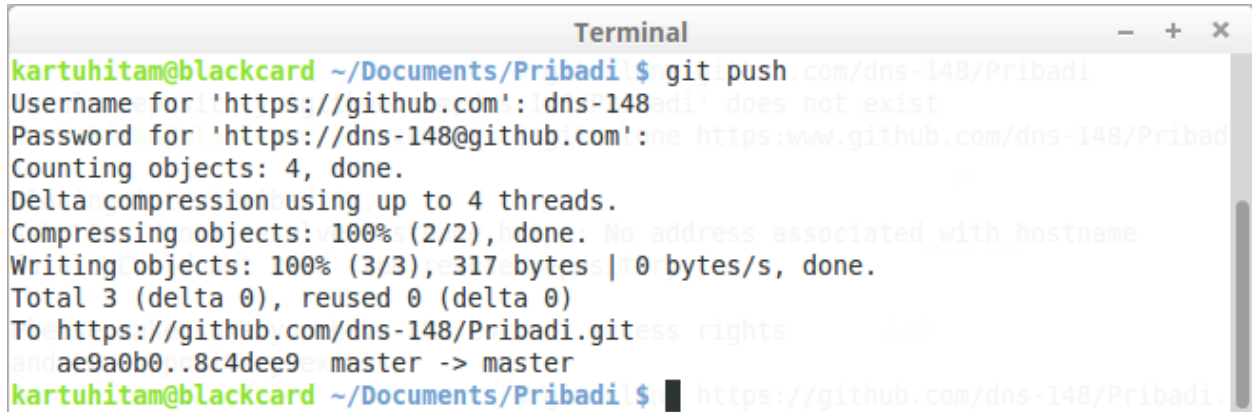
A terminal window titled "Terminal" with standard window controls. The prompt is "kartu hitam@blackcard ~/Documents/sisop \$". The command "git pull" is entered. The output shows the pulling process: "remote: Counting objects: 9, done.", "remote: Compressing objects: 100% (6/6), done.", "remote: Total 9 (delta 1), reused 0 (delta 0), pack-reused 3", "Unpacking objects: 100% (9/9), done.", "From https://github.com/cahyasetya/sisop", "389956e..75d4ff7 master -> origin/master", "Updating 389956e..75d4ff7", "error: Your local changes to the following files would be overwritten by merge:", "Tugas 2 shell.c", "Please, commit your changes or stash them before you can merge.", "Aborting". The prompt returns to "kartu hitam@blackcard ~/Documents/sisop \$".

```
Terminal
kartu hitam@blackcard ~/Documents/sisop $ git pull
remote: Counting objects: 9, done.
remote: Compressing objects: 100% (6/6), done.
remote: Total 9 (delta 1), reused 0 (delta 0), pack-reused 3
Unpacking objects: 100% (9/9), done.
From https://github.com/cahyasetya/sisop
389956e..75d4ff7 master -> origin/master
Updating 389956e..75d4ff7
error: Your local changes to the following files would be overwritten by merge:
Tugas 2 shell.c
Please, commit your changes or stash them before you can merge.
Aborting
kartu hitam@blackcard ~/Documents/sisop $
```

- git push :

Mengupload ke repository.

Contoh:



```

Terminal
kartuhitam@blackcard ~/Documents/Pribadi $ git push https://github.com/dns-148/Pribadi
Username for 'https://github.com': dns-148
Password for 'https://dns-148@github.com':
Counting objects: 4, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 317 bytes | 10 bytes/s, done.
Total 3 (delta 0), reused 0 (delta 0)
To https://github.com/dns-148/Pribadi.git
   ae9a0b0..8c4dee9 master -> master
kartuhitam@blackcard ~/Documents/Pribadi $

```

- git add namafile

Menambahkan file untuk ditrack.

Contoh:



```

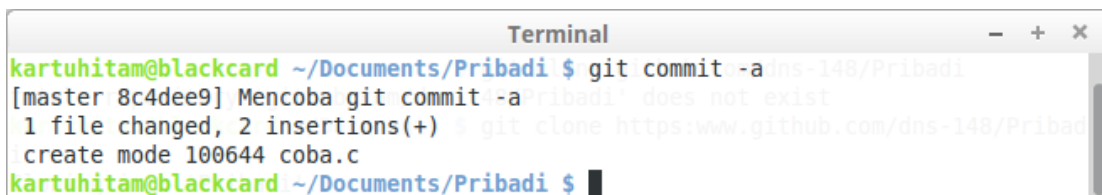
Terminal
kartuhitam@blackcard ~/Documents/Pribadi $ git add coba.c
kartuhitam@blackcard ~/Documents/Pribadi $

```

- git commit -a:

Menyetujui perubahan yang dilakukan di respitory local.

Contoh:



```

Terminal
kartuhitam@blackcard ~/Documents/Pribadi $ git commit -a
[master 8c4dee9] Mencoba git commit -a
1 file changed, 2 insertions(+)
create mode 100644 coba.c
kartuhitam@blackcard ~/Documents/Pribadi $

```

2. Mengelolah sebuah string:

- scanf :

Mendapatkan input dari user.

Contoh:

```
cobascanf.c (~/.Documents/SiSop/C Script) - VIM
#include <stdio.h>

int main(){
    char input[50];
    scanf("%[^\n]", input);

    printf("Hasil scanf: %s\n", input);
}
```

Hasil:

```
Terminal
kartu hitam@blackcard ~/.Documents/SiSop/C Script $ nano cobascanf.c
kartu hitam@blackcard ~/.Documents/SiSop/C Script $ gcc -o coba cobascanf.c
kartu hitam@blackcard ~/.Documents/SiSop/C Script $ ./coba
Hello World
Hasil scanf: Hello World
kartu hitam@blackcard ~/.Documents/SiSop/C Script $
```

- strstr :

Menemukan lokasi dari substring dan mendapatkan hasil substring dalam bentuk output string.

Contoh :

```
coba1.c (~/.Documents/SiSop/C Script) - VIM
#include <stdio.h>
#include <string.h>

int main(){
    char input[50];
    printf("Masukkan string : ");
    scanf("%[^\n]", input);

    printf("%s\n", input);
    char *substr = strstr(input, "o");

    printf("%s\n", substr);
    return 0;
}
```

Hasil:

```
Terminal
kartu hitam@blackcard ~/Documents/SiSop/C Script $ ./coba1
Masukkan string : Hello World
Hello World
o World
kartu hitam@blackcard ~/Documents/SiSop/C Script $
```

- strtok :

Mengeluarkan token dari string. Dimana memisahkan substring sebelum parameter.

Contoh :

```
coba2.c (~ / Documents / SiSop / C Script) - VIM
#include <stdio.h>
#include <string.h>

int main(){
    char input[50];
    printf("Masukkan string : ");
    scanf("%s", input);

    printf("Hasil strstr : ");
    char *substr = strstr(input, "o");

    printf("%s\n", substr);
    char *token = strtok(input, "o");

    while(token != NULL){
        printf("Hasil strtok : ");
        printf("%s\n", token);
        token = strtok(NULL, "o");
    }

    return 0;
}
```

Hasil :

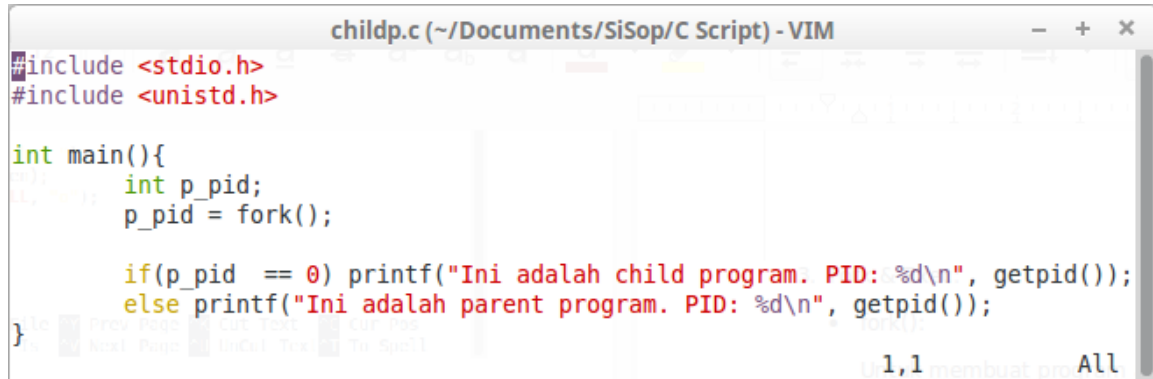
```
Terminal
kartu hitam@blackcard ~/Documents/SiSop/C Script $ ./coba2
Masukkan string : Hello World
Hasil strstr : o World
Hasil strtok : Hell
Hasil strtok : W
Hasil strtok : rld
kartu hitam@blackcard ~/Documents/SiSop/C Script $
```

3. Fork & Exec:

- fork():

Menduplikasi proses yang ada. Proses hasil duplikasi disebut proses anak.

Contoh:

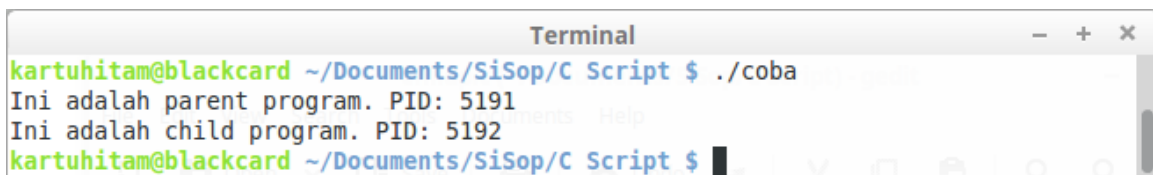


```
childp.c (~/Documents/SiSop/C Script) - VIM
#include <stdio.h>
#include <unistd.h>

int main(){
    int p_pid;
    p_pid = fork();

    if(p_pid == 0) printf("Ini adalah child program. PID: %d\n", getpid());
    else printf("Ini adalah parent program. PID: %d\n", getpid());
}
```

Hasil:



```
Terminal
kartu hitam@blackcard ~/Documents/SiSop/C Script $ ./coba
Ini adalah parent program. PID: 5191
Ini adalah child program. PID: 5192
kartu hitam@blackcard ~/Documents/SiSop/C Script $
```

- exec* family:

Menggantikan proses saat ini dengan proses baru.

- Perbedaan l dan v pada exec*:

- l: Dalam pemanggilan menggunakan parameter individu.
- v: Menggunakan parameter array char*(string).

- Perbedaan p dan e pada exec*:

- e: Sebagai tambahan melewati sebuah array char* untuk ditambahkan ke lingkungan proses baru sebelum proses dijalankan.
- p: menggunakan variabel path enviroment untuk mencari executable file yang disebut untuk dieksekusi.

- execl:

Format: execl(char *path, char *arg0,...,char *argn, 0);

Contoh:

```
Terminal
GNU nano 2.2.6 File: execl.c

#include <stdio.h>
#include <unistd.h>

int main(){
    int c_pid;
    c_pid = fork();

    if (c_pid == 0) execl( "/bin/ls", "ls", "-l", (char*)0 );
    else wait();
}

^G Get Help    ^O WriteOut    ^R Read File   ^Y Prev Page   ^K Cut Text     ^C Cur Pos
^X Exit        ^J Justify     ^W Where Is    ^V Next Page   ^U UnCut Text   ^T To Spell
```

Hasil:

```
Terminal
kartuhitam@blackcard ~/Documents/SiSop/C Script $ ./cobaexecl
total 228
-rwxr-xr-x 1 kartuhitam kartuhitam 16815 Nov  1 19:10 a.out
-rwxr-xr-x 1 kartuhitam kartuhitam  8773 Nov  2 06:31 coba1
-rw-r--r-- 1 kartuhitam kartuhitam   225 Nov  2 06:31 coba1.c
-rw-r--r-- 1 kartuhitam kartuhitam   285 Oct 21 09:15 coba1.c.save
-rwxr-xr-x 1 kartuhitam kartuhitam  8825 Nov  2 06:35 coba2
-rw-r--r-- 1 kartuhitam kartuhitam   432 Nov  2 06:34 coba2.c
-rwxr-xr-x 1 kartuhitam kartuhitam  8652 Nov  9 07:12 cobaexecl
-rw-r--r-- 1 kartuhitam kartuhitam   157 Nov  9 07:11 execl.c
-rwxr-xr-x 1 kartuhitam kartuhitam  8750 Oct 28 14:31 forkcoba
-rw-r--r-- 1 kartuhitam kartuhitam   663 Nov  9 06:22 forkcoba.c
-rw-r--r-- 1 kartuhitam kartuhitam   205 Oct 28 09:53 Git Command
-rw-r--r-- 1 kartuhitam kartuhitam    0 Oct 21 08:39 Git Command~
-rwxr-xr-x 1 kartuhitam kartuhitam 13546 Nov  2 18:59 khshell
-rw-r--r-- 1 kartuhitam kartuhitam  1460 Nov  2 19:00 khshell.c
-rw-r--r-- 1 kartuhitam kartuhitam   899 Oct 30 21:25 khshell.c.save
-rw-r--r-- 1 kartuhitam kartuhitam   536 Nov  2 09:28 khshell_v.1.c
-rw-r--r-- 1 kartuhitam kartuhitam   225 Oct 31 12:02 lol1.txt
-rw-r--r-- 1 kartuhitam kartuhitam   225 Oct 31 12:02 lol2.txt
-rw-r--r-- 1 kartuhitam kartuhitam    0 Oct 31 12:01 lol.txt
-rw-r--r-- 1 kartuhitam kartuhitam  2751 Oct 31 12:10 modul2_2.c
-rw-r--r-- 1 kartuhitam kartuhitam   990 Oct 30 15:38 refrensi_multithread.c
-rw-r--r-- 1 kartuhitam kartuhitam   112 Oct 21 09:06 Setting Proxy
-rw-r--r-- 1 kartuhitam kartuhitam   111 Oct 21 08:30 Setting Proxy~
-rwxr-xr-x 1 kartuhitam kartuhitam  8653 Oct 31 11:00 t1
-rw-r--r-- 1 kartuhitam kartuhitam   198 Oct 31 11:00 t1.c
-rwxr-xr-x 1 kartuhitam kartuhitam  8601 Oct 31 10:59 t2
-rw-r--r-- 1 kartuhitam kartuhitam    98 Oct 31 10:59 t2.c
-rwxr-xr-x 1 kartuhitam kartuhitam  8673 Oct 30 18:15 testing
-rw-r--r-- 1 kartuhitam kartuhitam   271 Oct 30 18:15 testing.c
-rw-r--r-- 1 kartuhitam kartuhitam  8730 Oct 21 09:33 thread1
-rw-r--r-- 1 kartuhitam kartuhitam   541 Oct 21 09:43 thread1.c
-rwxr-xr-x 1 kartuhitam kartuhitam  9045 Nov  1 21:30 try1
-rw-r--r-- 1 kartuhitam kartuhitam    0 Oct 21 08:28 Untitled Document~
-rw-r--r-- 1 kartuhitam kartuhitam   911 Nov  1 21:30 Using_PAM2.c
-rw-r--r-- 1 kartuhitam kartuhitam   689 Nov  1 21:31 Using_PAM.c
kartuhitam@blackcard ~/Documents/SiSop/C Script $
```

➤ execlp:

Format: execlp(const char *file, const char *arg, ...);

Contoh:

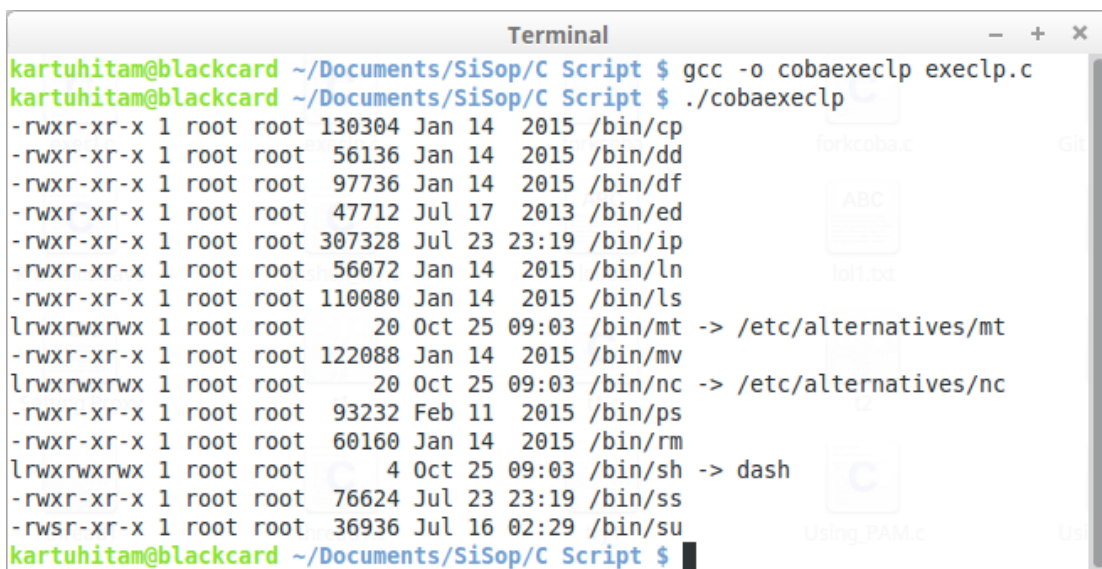


```
exelcp.c (~/.Documents/SiSop/C Script) - VIM
#include <stdio.h>
#include <unistd.h>

int main(){
    int c_pid;
    c_pid = fork();

    if (c_pid == 0) execlp("/bin/sh", "/bin/sh", "-c", "ls -l /bin/??", (char *)0);
    else wait();
}
```

Hasil:



```
Terminal
kartuhitam@blackcard ~/Documents/SiSop/C Script $ gcc -o cobaexeclp exelcp.c
kartuhitam@blackcard ~/Documents/SiSop/C Script $ ./cobaexeclp
-rwxr-xr-x 1 root root 130304 Jan 14 2015 /bin/cp
-rwxr-xr-x 1 root root 56136 Jan 14 2015 /bin/dd
-rwxr-xr-x 1 root root 97736 Jan 14 2015 /bin/df
-rwxr-xr-x 1 root root 47712 Jul 17 2013 /bin/ed
-rwxr-xr-x 1 root root 307328 Jul 23 23:19 /bin/ip
-rwxr-xr-x 1 root root 56072 Jan 14 2015 /bin/ln
-rwxr-xr-x 1 root root 110080 Jan 14 2015 /bin/ls
lrwxrwxrwx 1 root root 20 Oct 25 09:03 /bin/mt -> /etc/alternatives/mt
-rwxr-xr-x 1 root root 122088 Jan 14 2015 /bin/mv
lrwxrwxrwx 1 root root 20 Oct 25 09:03 /bin/nc -> /etc/alternatives/nc
-rwxr-xr-x 1 root root 93232 Feb 11 2015 /bin/ps
-rwxr-xr-x 1 root root 60160 Jan 14 2015 /bin/rm
lrwxrwxrwx 1 root root 4 Oct 25 09:03 /bin/sh -> dash
-rwxr-xr-x 1 root root 76624 Jul 23 23:19 /bin/ss
-rwsr-xr-x 1 root root 36936 Jul 16 02:29 /bin/su
kartuhitam@blackcard ~/Documents/SiSop/C Script $
```

➤ execl:

Format: execl(const char *path, const char *arg, ..., char * const envp[]);

Contoh:



```
execl.c (~/.Documents/SiSop/C Script) - VIM
#include <stdio.h>
#include <unistd.h>

int main(){
    int c_pid;
    char *env[] = { "HOME=/usr/home", "LOGNAME=home", (char *)0 };
    c_pid = fork();

    if (c_pid == 0) execl ("/bin/ls", "ls", "-l", (char *)0, env);
    else wait();
}
```


Hasil:

```
Terminal
kartuहितam@blackcard ~/Documents/SiSop/C Script $ ./cobaexecle
total 260
-rw----- 1 kartuहितam kartuहितam 205 Oct 28 09:53 Git Command
-rw----- 1 kartuहितam kartuहितam 0 Oct 21 08:39 Git Command~
-rw----- 1 kartuहितam kartuहितam 112 Oct 21 09:06 Setting Proxy
-rw----- 1 kartuहितam kartuहितam 111 Oct 21 08:30 Setting Proxy~
-rw----- 1 kartuहितam kartuहितam 0 Oct 21 08:28 Untitled Document~
-rw-r--r-- 1 kartuहितam kartuहितam 689 Nov 1 21:31 Using_PAM.c
-rw-r--r-- 1 kartuहितam kartuहितam 911 Nov 1 21:30 Using_PAM2.c
-rwxr-xr-x 1 kartuहितam kartuहितam 16815 Nov 1 19:10 a.out
-rwxr-xr-x 1 kartuहितam kartuहितam 8773 Nov 2 06:31 cobra1
-rw----- 1 kartuहितam kartuहितam 225 Nov 2 06:31 cobra1.c
-rw----- 1 kartuहितam kartuहितam 285 Oct 21 09:15 cobra1.c.save
-rwxr-xr-x 1 kartuहितam kartuहितam 8825 Nov 2 06:35 cobra2
-rw----- 1 kartuहितam kartuहितam 432 Nov 2 06:34 cobra2.c
-rwxr-xr-x 1 kartuहितam kartuहितam 8652 Nov 9 07:12 cobraexec1
-rwxr-xr-x 1 kartuहितam kartuहितam 8654 Nov 9 07:27 cobraexecle
-rwxr-xr-x 1 kartuहितam kartuहितam 8654 Nov 9 07:19 cobraexec1p
-rw-r--r-- 1 kartuहितam kartuहितam 157 Nov 9 07:11 execl.c
-rw-r--r-- 1 kartuहितam kartuहितam 227 Nov 9 07:27 execle.c
-rw-r--r-- 1 kartuहितam kartuहितam 178 Nov 9 07:19 execlp.c
-rwxr-xr-x 1 kartuहितam kartuहितam 8750 Oct 28 14:31 forkcobra
-rw----- 1 kartuहितam kartuहितam 663 Nov 9 06:22 forkcobra.c
-rwxr-xr-x 1 kartuहितam kartuहितam 13546 Nov 2 18:59 khshell
-rw-r--r-- 1 kartuहितam kartuहितam 1460 Nov 2 19:00 khshell.c
-rw-r--r-- 1 kartuहितam kartuहितam 899 Oct 30 21:25 khshell.c.save
-rw-r--r-- 1 kartuहितam kartuहितam 536 Nov 2 09:28 khshell_v.1.c
-rw-r--r-- 1 kartuहितam kartuहितam 0 Oct 31 12:01 lol.txt
-rw-r--r-- 1 kartuहितam kartuहितam 225 Oct 31 12:02 lol1.txt
-rw-r--r-- 1 kartuहितam kartuहितam 225 Oct 31 12:02 lol2.txt
-rw-r--r-- 1 kartuहितam kartuहितam 2751 Oct 31 12:10 modul2_2.c
-rw-r--r-- 1 kartuहितam kartuहितam 990 Oct 30 15:38 refrensi_multithread.c
-rwxr-xr-x 1 kartuहितam kartuहितam 8653 Oct 31 11:00 t1
-rw-r--r-- 1 kartuहितam kartuहितam 198 Oct 31 11:00 t1.c
-rwxr-xr-x 1 kartuहितam kartuहितam 8601 Oct 31 10:59 t2
-rw-r--r-- 1 kartuहितam kartuहितam 98 Oct 31 10:59 t2.c
-rwxr-xr-x 1 kartuहितam kartuहितam 8673 Oct 30 18:15 testing
-rw-r--r-- 1 kartuहितam kartuहितam 271 Oct 30 18:15 testing.c
-rw----- 1 kartuहितam kartuहितam 8730 Oct 21 09:33 thread1
-rw----- 1 kartuहितam kartuहितam 541 Oct 21 09:43 thread1.c
-rwxr-xr-x 1 kartuहितam kartuहितam 9045 Nov 1 21:30 try1
kartuहितam@blackcard ~/Documents/SiSop/C Script $
```

➤ execv:

Format: `execv(const char *path, char *const argv[]);`

Contoh:

```

execv.c (~/Documents/SiSop/C Script) - VIM
#include <stdio.h>
#include <unistd.h>

int main(){
    int c_pid;
    c_pid = fork();
    char *cmd[] = { "ls", "-l", (char *)0 };
    if (c_pid == 0) execv ("/bin/ls", cmd);
    else wait();
}

```

Hasil:

```

Terminal
kartuhitam@blackcard ~/Documents/SiSop/C Script $ ./cobaexecv
total 276
-rwxr-xr-x 1 kartuhitam kartuhitam 16815 Nov  1 19:10 a.out
-rwxr-xr-x 1 kartuhitam kartuhitam  8773 Nov  2 06:31 cobal
-rw-r--r-- 1 kartuhitam kartuhitam   225 Nov  2 06:31 cobal.c
-rw-r--r-- 1 kartuhitam kartuhitam   285 Oct 21 09:15 cobal.c.save
-rwxr-xr-x 1 kartuhitam kartuhitam  8825 Nov  2 06:35 coba2
-rw-r--r-- 1 kartuhitam kartuhitam   432 Nov  2 06:34 coba2.c
-rwxr-xr-x 1 kartuhitam kartuhitam  8652 Nov  9 07:12 cobaexec1
-rwxr-xr-x 1 kartuhitam kartuhitam  8654 Nov  9 07:27 cobaexecle
-rwxr-xr-x 1 kartuhitam kartuhitam  8654 Nov  9 07:19 cobaexec1p
-rwxr-xr-x 1 kartuhitam kartuhitam  8652 Nov  9 07:38 cobaexecv
-rw-r--r-- 1 kartuhitam kartuhitam   157 Nov  9 07:11 execl.c
-rw-r--r-- 1 kartuhitam kartuhitam   227 Nov  9 07:27 execl.c
-rw-r--r-- 1 kartuhitam kartuhitam   178 Nov  9 07:19 execlp.c
-rw-r--r-- 1 kartuhitam kartuhitam   181 Nov  9 07:38 execv.c
-rwxr-xr-x 1 kartuhitam kartuhitam  8750 Oct 28 14:31 forkcoba
-rw-r--r-- 1 kartuhitam kartuhitam   663 Nov  9 06:22 forkcoba.c
-rw-r--r-- 1 kartuhitam kartuhitam   205 Oct 28 09:53 Git Command
-rw-r--r-- 1 kartuhitam kartuhitam     0 Oct 21 08:39 Git Command~
-rwxr-xr-x 1 kartuhitam kartuhitam 13546 Nov  2 18:59 khshell
-rw-r--r-- 1 kartuhitam kartuhitam  1460 Nov  2 19:00 khshell.c
-rw-r--r-- 1 kartuhitam kartuhitam   899 Oct 30 21:25 khshell.c.save
-rw-r--r-- 1 kartuhitam kartuhitam   536 Nov  2 09:28 khshell_v.1.c

```

➤ execvp:

Format: execvp(const char *file, char *const argv[]);

Contoh:

```
execvp.c (~/Documents/SiSop/C Script) - VIM
#include <stdio.h>
#include <unistd.h>

int main(){
    int c_pid;
    c_pid = fork();
    char *cmd[] = { "ls", "-l", (char *)0 };

    if (c_pid == 0) execvp(cmd[0], cmd);
    else wait();
}
```

Hasil:

```
Terminal
kartuhitam@blackcard ~/Documents/SiSop/C Script $ gcc -o cobaexecvp execvp.c
kartuhitam@blackcard ~/Documents/SiSop/C Script $ ./cobaexecvp
total 292
-rwxr-xr-x 1 kartuhitam kartuhitam 16815 Nov  1 19:10 a.out
-rwxr-xr-x 1 kartuhitam kartuhitam  8773 Nov  2 06:31 coba1
-rw-r--r-- 1 kartuhitam kartuhitam   225 Nov  2 06:31 coba1.c
-rw-r--r-- 1 kartuhitam kartuhitam   285 Oct 21 09:15 coba1.c.save
-rwxr-xr-x 1 kartuhitam kartuhitam  8825 Nov  2 06:35 coba2
-rw-r--r-- 1 kartuhitam kartuhitam   432 Nov  2 06:34 coba2.c
-rwxr-xr-x 1 kartuhitam kartuhitam  8652 Nov  9 07:12 cobaexec1
-rwxr-xr-x 1 kartuhitam kartuhitam  8654 Nov  9 07:27 cobaexecle
-rwxr-xr-x 1 kartuhitam kartuhitam  8654 Nov  9 07:19 cobaexec1p
-rwxr-xr-x 1 kartuhitam kartuhitam  8652 Nov  9 07:38 cobaexecv
-rwxr-xr-x 1 kartuhitam kartuhitam  8654 Nov  9 07:44 cobaexecvp
-rw-r--r-- 1 kartuhitam kartuhitam   157 Nov  9 07:11 execl.c
-rw-r--r-- 1 kartuhitam kartuhitam   227 Nov  9 07:27 execl.c
-rw-r--r-- 1 kartuhitam kartuhitam   178 Nov  9 07:19 execlp.c
-rw-r--r-- 1 kartuhitam kartuhitam   181 Nov  9 07:38 execv.c
-rw-r--r-- 1 kartuhitam kartuhitam   178 Nov  9 07:43 execvp.c
-rwxr-xr-x 1 kartuhitam kartuhitam  8750 Oct 28 14:31 forkcoba
-rw-r--r-- 1 kartuhitam kartuhitam   663 Nov  9 06:22 forkcoba.c
-rw-r--r-- 1 kartuhitam kartuhitam   205 Oct 28 09:53 Git Command
-rw-r--r-- 1 kartuhitam kartuhitam    0 Oct 21 08:39 Git Command~
-rwxr-xr-x 1 kartuhitam kartuhitam 13546 Nov  2 18:59 khshell
-rw-r--r-- 1 kartuhitam kartuhitam  1460 Nov  2 19:00 khshell.c
-rw-r--r-- 1 kartuhitam kartuhitam   899 Oct 30 21:25 khshell.c.save
-rw-r--r-- 1 kartuhitam kartuhitam   536 Nov  2 09:28 khshell_v.1.c
-rw-r--r-- 1 kartuhitam kartuhitam   225 Oct 31 12:02 lol1.txt
-rw-r--r-- 1 kartuhitam kartuhitam   225 Oct 31 12:02 lol2.txt
```

➤ execve:

Format: `execve(const char *filename, char *const argv[], char *const envp[]);`

Contoh:

```
execve.c (~/.Documents/SiSop/C Script) - VIM
#include <stdio.h>
#include <unistd.h>

int main(){
    int c_pid;
    c_pid = fork();
    char *cmd[] = { "ls", "-l", (char *)0 };
    char *env[] = { "HOME=/usr/home", "LOGNAME=home", (char *)0 };
    if (c_pid == 0) execve("/bin/ls", cmd, env);
    else wait();
}
```

Hasil:

```
Terminal
kartuhitam@blackcard ~/Documents/SiSop/C Script $ gcc -o cobaexecve execve.c
kartuhitam@blackcard ~/Documents/SiSop/C Script $ ./cobaexecve
total 308
-rw-r----- 1 kartuhitam kartuhitam 205 Oct 28 09:53 Git Command
-rw-r----- 1 kartuhitam kartuhitam 0 Oct 21 08:39 Git Command~
-rw-r----- 1 kartuhitam kartuhitam 112 Oct 21 09:06 Setting Proxy
-rw-r----- 1 kartuhitam kartuhitam 111 Oct 21 08:30 Setting Proxy~
-rw-r----- 1 kartuhitam kartuhitam 0 Oct 21 08:28 Untitled Document~
-rw-r--r-- 1 kartuhitam kartuhitam 689 Nov 1 21:31 Using_PAM.c
-rw-r--r-- 1 kartuhitam kartuhitam 911 Nov 1 21:30 Using_PAM2.c
-rwxr-xr-x 1 kartuhitam kartuhitam 16815 Nov 1 19:10 a.out
-rwxr-xr-x 1 kartuhitam kartuhitam 8773 Nov 2 06:31 cobal
-rw-r----- 1 kartuhitam kartuhitam 225 Nov 2 06:31 cobal.c
-rw-r----- 1 kartuhitam kartuhitam 285 Oct 21 09:15 cobal.c.save
-rwxr-xr-x 1 kartuhitam kartuhitam 8825 Nov 2 06:35 coba2
-rw-r----- 1 kartuhitam kartuhitam 432 Nov 2 06:34 coba2.c
-rwxr-xr-x 1 kartuhitam kartuhitam 8652 Nov 9 07:12 cobaexec1
-rwxr-xr-x 1 kartuhitam kartuhitam 8654 Nov 9 07:27 cobaexecle
-rwxr-xr-x 1 kartuhitam kartuhitam 8654 Nov 9 07:19 cobaexeclp
-rwxr-xr-x 1 kartuhitam kartuhitam 8652 Nov 9 07:38 cobaexecv
-rwxr-xr-x 1 kartuhitam kartuhitam 8654 Nov 9 07:51 cobaexecve
-rwxr-xr-x 1 kartuhitam kartuhitam 8654 Nov 9 07:44 cobaexecvp
-rw-r--r-- 1 kartuhitam kartuhitam 157 Nov 9 07:11 execl.c
-rw-r--r-- 1 kartuhitam kartuhitam 227 Nov 9 07:27 execl.c
-rw-r--r-- 1 kartuhitam kartuhitam 178 Nov 9 07:19 execlp.c
-rw-r--r-- 1 kartuhitam kartuhitam 181 Nov 9 07:38 execlp.c
-rw-r--r-- 1 kartuhitam kartuhitam 250 Nov 9 07:50 execv.c
-rw-r--r-- 1 kartuhitam kartuhitam 178 Nov 9 07:43 execvp.c
```

- Contoh lain dari fork + exec:

Sebuah program yang memiliki 3 child, dimana program tersebut menjalankan:

1. Menghitung penjumlahan 2 buah bilangan dan menaruh hasil pada file.
2. Menampilkan file yang terdapat pada /home.
3. Menampilkan angka 1 – 100.

Code:



```
cbdikelas.c (~/Documents/SiSop/C Script) - VIM
#include <stdio.h>
#include <unistd.h>

void Menghitung(){
    int a, b;
    FILE *out = fopen("result.txt","w");
    scanf("%d %d", &a, &b);
    printf("%d\n", a+b);
    fprintf(out,"%d\n", a+b);
    fclose(out);
}

void Tampilkan_100(){
    int i;
    for(i = 1; i <=100; i++)
        printf("%d\n", i);
}

int main(){
    int pid;
    pid = fork();

    if(pid == 0){
        pid = fork();
        if(pid == 0){
            pid = fork();
            if(pid == 0){
                Tampilkan_100();
            }else wait();
        }else execl("/bin/ls","ls","-l", "/home", (char*)0);
    }else Menghitung();
}
```

1,1 All

Hasil:


```
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100
total 4
drwxr-xr-x 30 kartu hitam kartu hitam 4096 Nov 10 20:17 kartu hitam
2 3
5
kartu hitam@blackcard ~/Documents/SiSop/C Script $
```


- Signal handling:

Menerima signal dan menangani signal yang dikirim.

Contoh:

```

signalhandler.c (~\Documents\SiSop\C Script) - VIM
#include <stdio.h>
#include <signal.h>

void signal_handler(int signal){
    printf("\nSIGINT\n");
}

int main(){
    signal(SIGINT, signal_handler);
    while(1){}
}

```

Hasil:

[illegible]

➤ Beberapa signal yang ada:

No. Signal	Nama Signal	Kegunaan
1	SIGHUP	Hangup terdeteksi pada terminal pengendalian atau matinya proses yang mengendalikan
2	SIGINT	Signal interrupt, dimana proses diinterupsi (Ctrl + C pada keyboard).
9	SIGKILL	Mengakhiri eksekusi program saat itu juga.
10	SIGUSR1	Signal yang ditentukan pengguna 1.
11	SIGSEV	Program mengalami segmentation fault.
12	SIGUSR2	Signal yang ditentukan pengguna 2.
15	SIGTERM	Mengakhiri eksekusi program.
18	SIGCONT	Melanjutkan kembali program yang distop.
19	SIGSTOP	Menghentikan sementara suatu proses saat ini juga.
20	SIGTSTP	Secara esensi sama dengan SIGSTOP. Signal ini dikirim ketika user menekan Ctrl + Z pada terminal. Satu-satunya perbedaan antara SIGTSTP dan SIGSTOP adalah bahwa yang berhenti sejenak hanya tindakan default untuk SIGTSTP, tetapi tindakan yang diperlukan untuk SIGSTOP. Sehingga SIGTSTP dapat dihandle.

4. Threading

- Create:

Membuat thread baru.

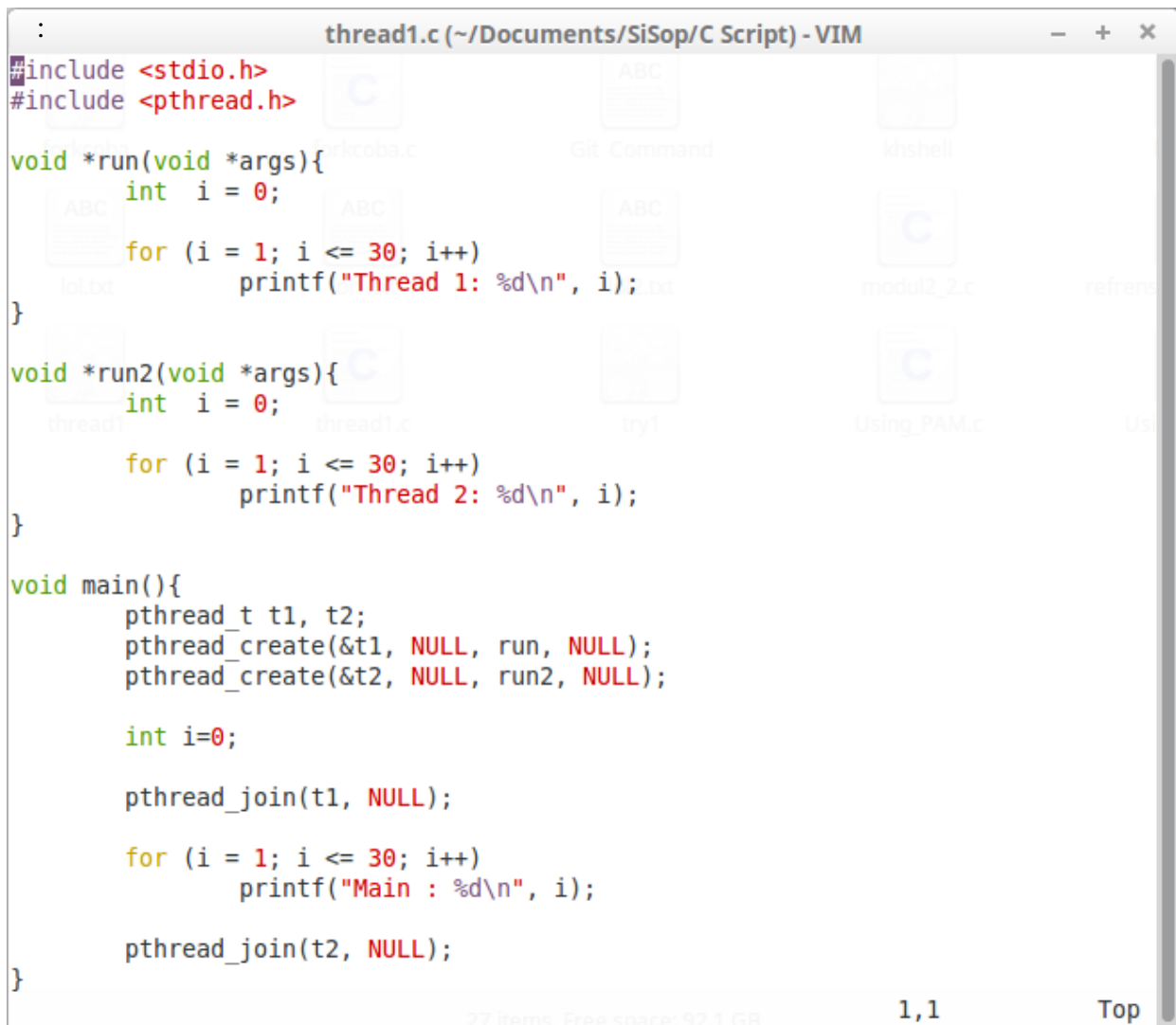
Format: `pthread_create(pthread_t nama_thread, const pthread_attr_t *attr, void *(*start_routine) (void *), void *arg)`

- Joint :

Bergabung dengan thread yang telah di terminate.

Format: `pthread_join(pthread_t thread, void **retval)`

Contoh untuk Thread create dan joint :



```
thread1.c (~/.Documents/SiSop/C Script) - VIM
#include <stdio.h>
#include <pthread.h>

void *run(void *args){
    int i = 0;
    for (i = 1; i <= 30; i++)
        printf("Thread 1: %d\n", i);
}

void *run2(void *args){
    int i = 0;
    for (i = 1; i <= 30; i++)
        printf("Thread 2: %d\n", i);
}

void main(){
    pthread_t t1, t2;
    pthread_create(&t1, NULL, run, NULL);
    pthread_create(&t2, NULL, run2, NULL);

    int i=0;

    pthread_join(t1, NULL);

    for (i = 1; i <= 30; i++)
        printf("Main : %d\n", i);

    pthread_join(t2, NULL);
}
```

27 items, Free space: 92.1 GB 1,1 Top

Hasil:

```
Terminal
kartuhitam@blackcard ~/Documents/SiSop/C Script $ gcc -o thread1 thread1.c -lpthread
read
kartuhitam@blackcard ~/Documents/SiSop/C Script $ ./thread1
Thread 1: 1
Thread 1: 2
Thread 1: 3
Thread 1: 4
Thread 1: 5
Thread 1: 6
Thread 1: 7
Thread 1: 8
Thread 1: 9
Thread 1: 10
Thread 1: 11
Thread 1: 12
Thread 1: 13
Thread 1: 14
Thread 1: 15
Thread 1: 16
Thread 1: 17
Thread 1: 18
Thread 1: 19
Thread 1: 20
Thread 1: 21
Thread 1: 22
Thread 1: 23
Thread 1: 24
Thread 1: 25
Thread 1: 26
Thread 1: 27
Thread 1: 28
Thread 1: 29
Thread 1: 30
Thread 2: 1
Thread 2: 2
Thread 2: 3
Thread 2: 4
Thread 2: 5
Thread 2: 6
Thread 2: 7
Thread 2: 8
```

```
Terminal
Thread 2: 9
Thread 2: 10
Thread 2: 11
Thread 2: 12
Thread 2: 13
Thread 2: 14
Thread 2: 15
Thread 2: 16
Thread 2: 17
Thread 2: 18
Thread 2: 19
Thread 2: 20
Main : 1
Main : 2
Main : 3
Main : 4
Main : 5
Main : 6
Main : 7
Main : 8
Main : 9
Main : 10
Main : 11
Main : 12
Main : 13
Main : 14
Main : 15
Main : 16
Main : 17
Main : 18
Main : 19
Main : 20
Main : 21
Main : 22
Thread 2: 21
Thread 2: 22
Main : 23
Main : 24
Main : 25
Main : 26
Main : 27
Main : 28
Main : 29
Main : 30
Thread 2: 23
Thread 2: 24
Thread 2: 25
Thread 2: 26
Thread 2: 27
Thread 2: 28
Thread 2: 29
Thread 2: 30
kartuhitam@blackcard ~/Documents/SiSop/C Script $
```