PRAKTIKUM SISTEM OPERASI

MODUL 8 : SYSTEM CALL

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PROGRAM STUDI TEKNIK INFORMATIKA

FAKULTAS KOMUNIKASI DAN INFORMATIKA

UNIVERSITAS MUHAMMADIYAH SURAKARTA

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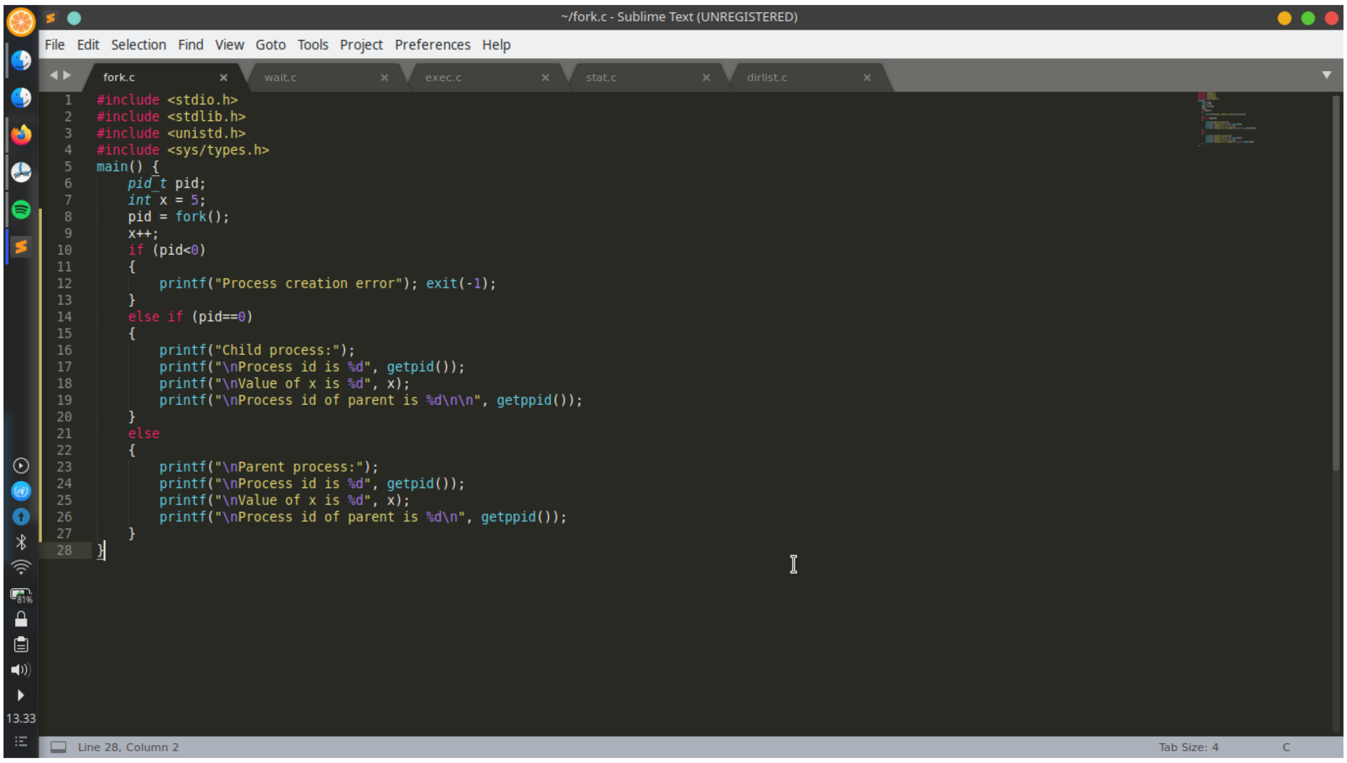
Langkah Kerja.

1. Membuat sebuah ‘child process’ (proses baru) dengan menggunakan system call ‘fork’.

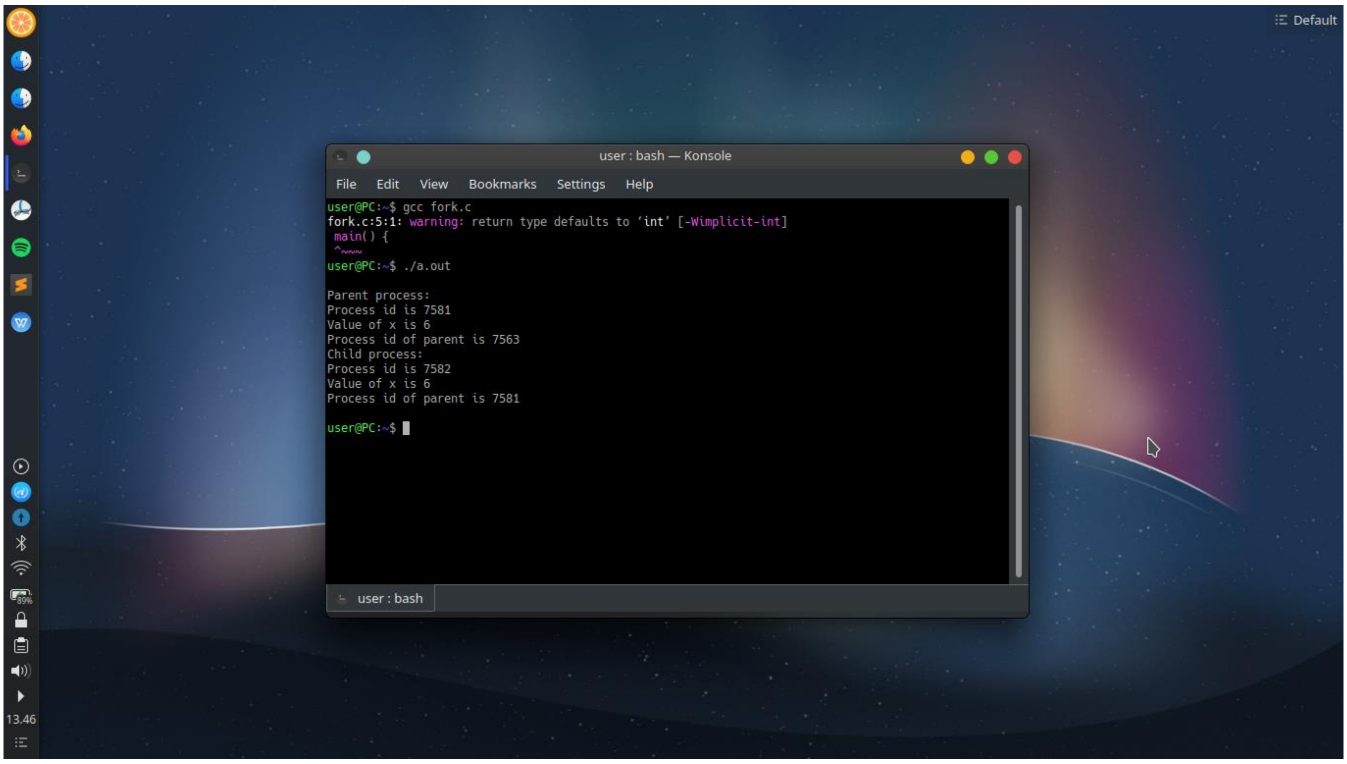
Kode Program fork.c



~/fork.c - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
fork.c
wait.c
exec.c
stat.c
dirlist.c
Line 28, Column 2
Tab Size: 4
C
13.33

```c
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/types.h>
main() {
    pid_t pid;
    int x = 5;
    pid = fork();
    x++;
    if (pid<0)
    {
        printf("Process creation error"); exit(-1);
    }
    else if (pid==0)
    {
        printf("Child process:");
        printf("\nProcess id is %d", getpid());
        printf("\nValue of x is %d", x);
        printf("\nProcess id of parent is %d\n\n", getppid());
    }
    else
    {
        printf("\nParent process:");
        printf("\nProcess id is %d", getpid());
        printf("\nValue of x is %d", x);
        printf("\nProcess id of parent is %d\n", getppid());
    }
}
```

Memanggil melalui terminal



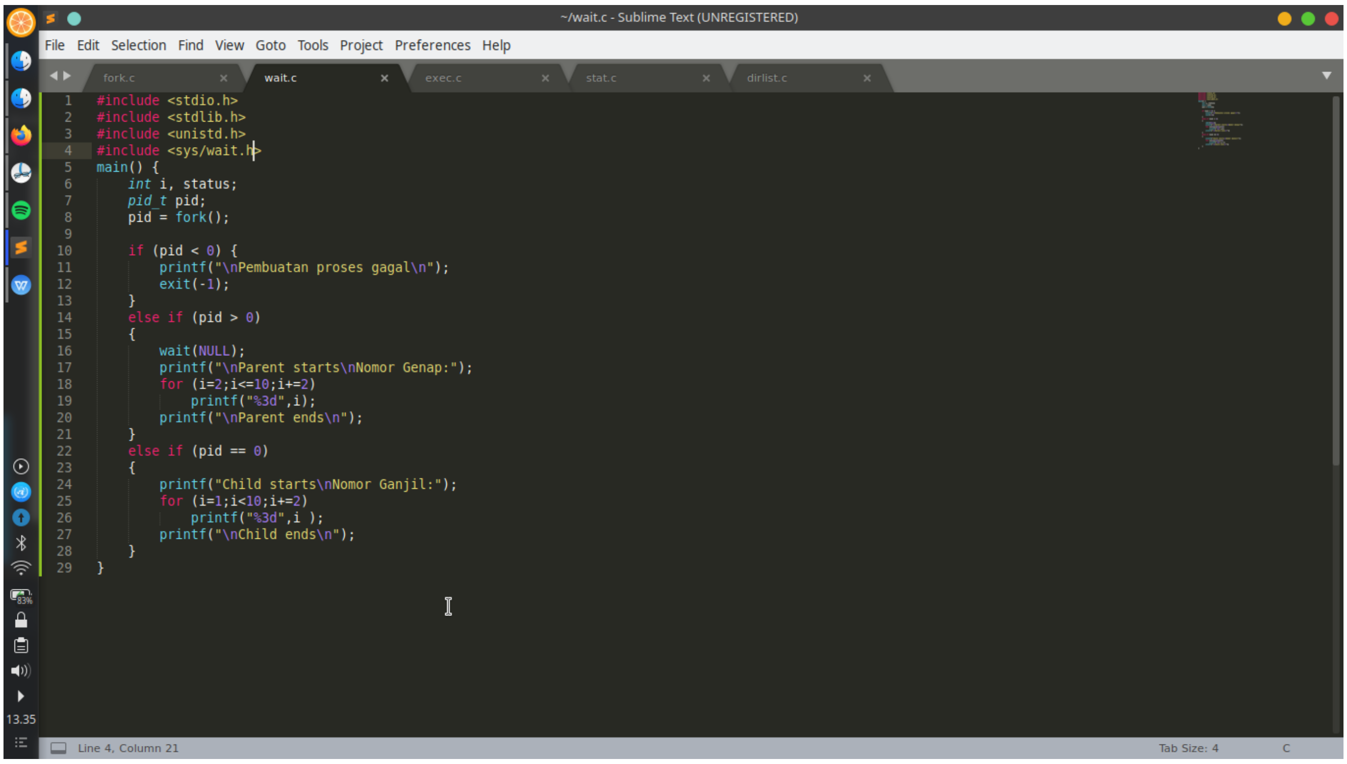
```
user@PC:~$ gcc fork.c
fork.c:5:1: warning: return type defaults to ‘int’ [-Wimplicit-int]
 main() {
 ^~~~
user@PC:~$ ./a.out

Parent process:
Process id is 7581
Value of x is 6
Process id of parent is 7563
Child process:
Process id is 7582
Value of x is 6
Process id of parent is 7581

user@PC:~$ 
```

2. Menghentikan sementara (block) proses parent sampai dengan proses child selesai, menggunkaan perintah system call ‘wait’.

Kode Program wait.c

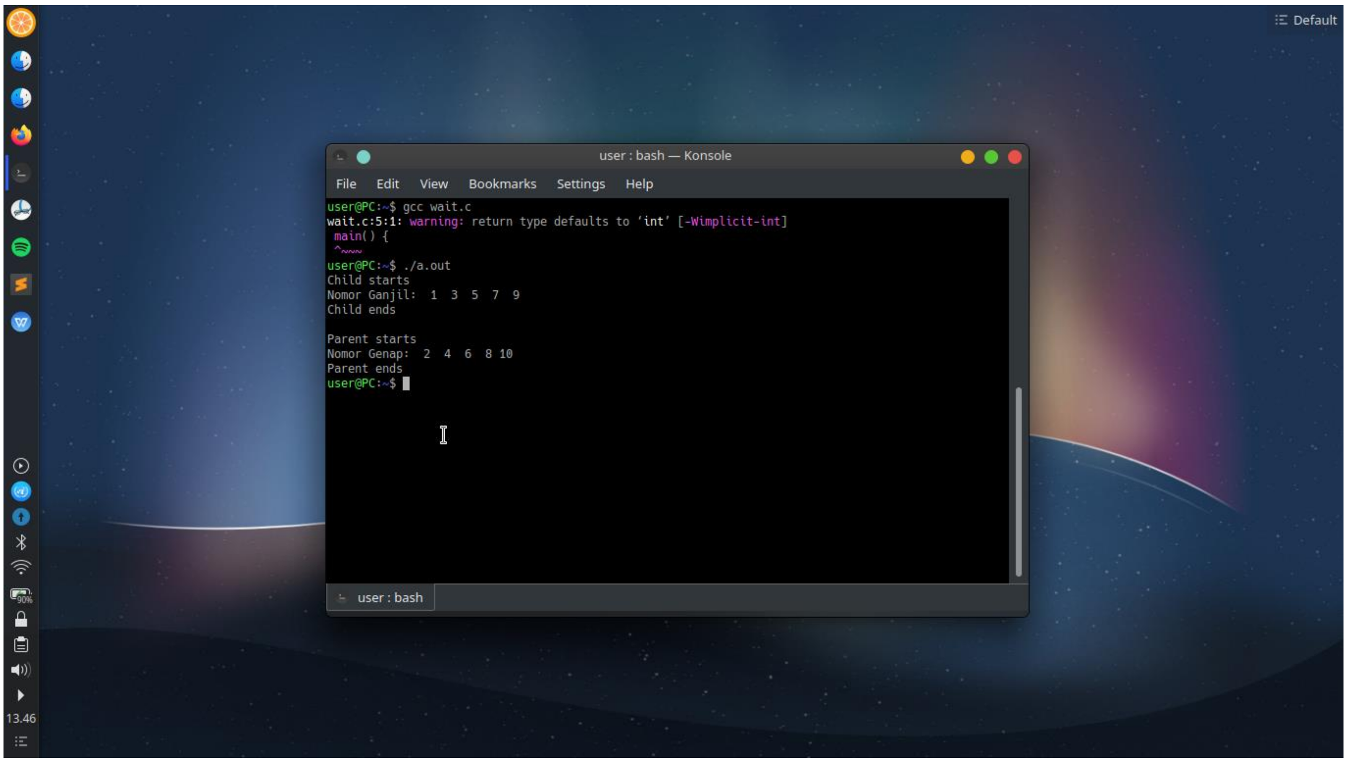


~/wait.c - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
fork.c
wait.c
exec.c
stat.c
dirlist.c
Line 4, Column 21
Tab Size: 4
C
13.35

```c
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/wait.h>
main() {
    int i, status;
    pid_t pid;
    pid = fork();

    if (pid < 0) {
        printf("\nPembuatan proses gagal\n");
        exit(-1);
    }
    else if (pid > 0)
    {
        wait(NULL);
        printf("\nParent starts\nNomor Genap:");
        for (i=2;i<=10;i+=2)
            printf("%3d",i);
        printf("\nParent ends\n");
    }
    else if (pid == 0)
    {
        printf("Child starts\nNomor Ganjil:");
        for (i=1;i<10;i+=2)
            printf("%3d",i );
        printf("\nChild ends\n");
    }
}
```

Memanggil melalui terminal

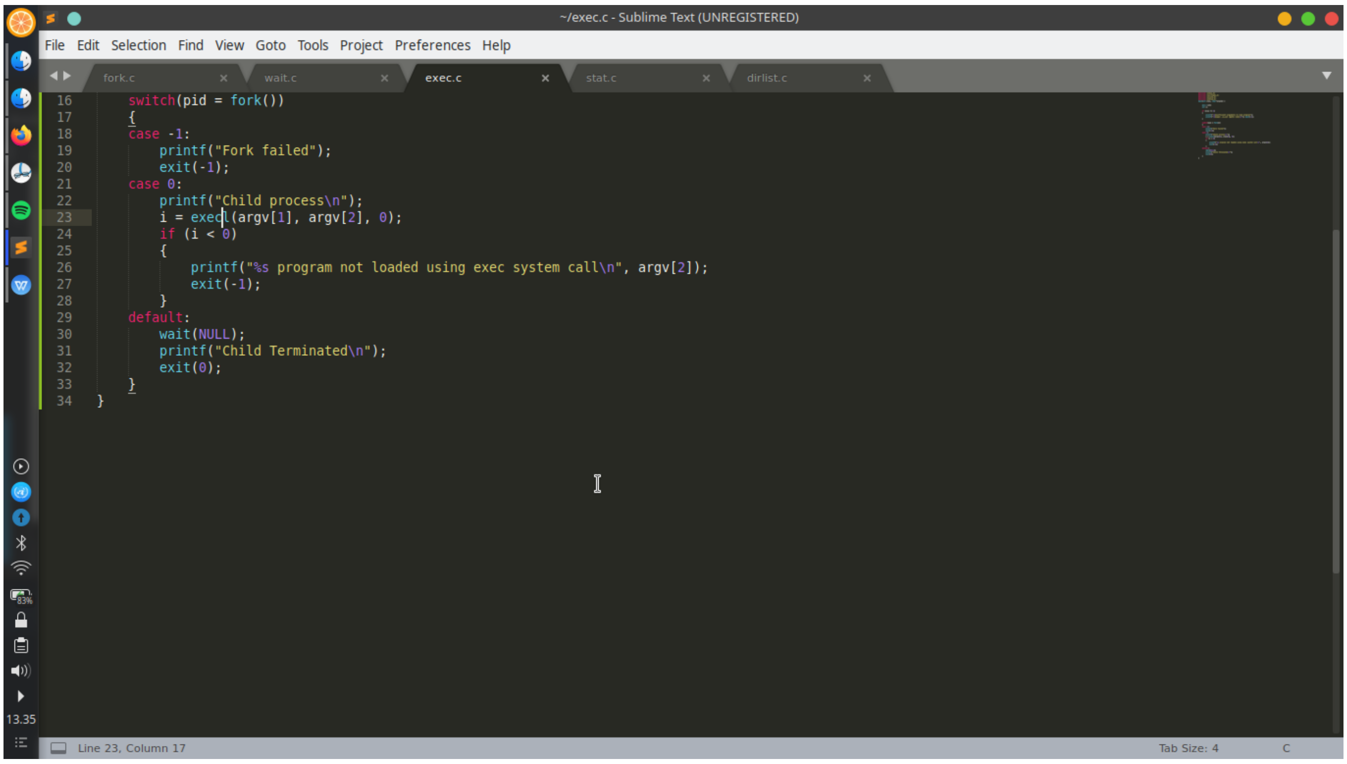


```
user@PC:~$ gcc wait.c
wait.c:5:1: warning: return type defaults to ‘int’ [-Wimplicit-int]
 main() {
 ^~~~
user@PC:~$ ./a.out
Child starts
Nomor Ganjil:  1  3  5  7  9
Child ends

Parent starts
Nomor Genap:  2  4  6  8 10
Parent ends
user@PC:~$
```

3. Loading program yang dapat dieksekusi dalam sebuah ‘child’ proses menggunakan perintah system call ‘exec’.

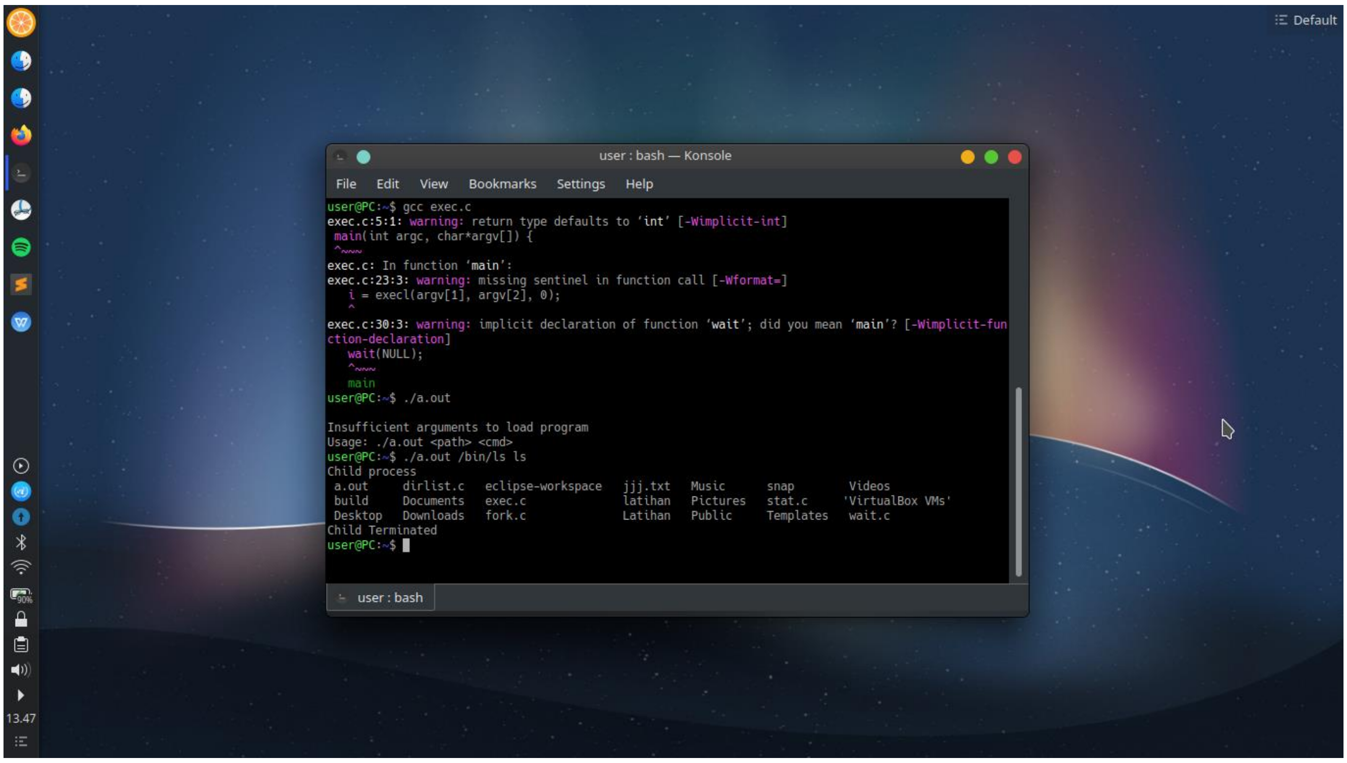
Kode Program exec.c



```c
    switch(pid = fork())
    {
    case -1:
        printf("Fork failed");
        exit(-1);
    case 0:
        printf("Child process\n");
        i = execl(argv[1], argv[2], 0);
        if (i < 0)
        {
            printf("%s program not loaded using exec system call\n", argv[2]);
            exit(-1);
        }
    default:
        wait(NULL);
        printf("Child Terminated\n");
        exit(0);
    }
}
```

~/exec.c - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
fork.c
wait.c
exec.c
stat.c
dirlist.c
13.35
Line 23, Column 17
Tab Size: 4
C

Memanggil melalui terminal

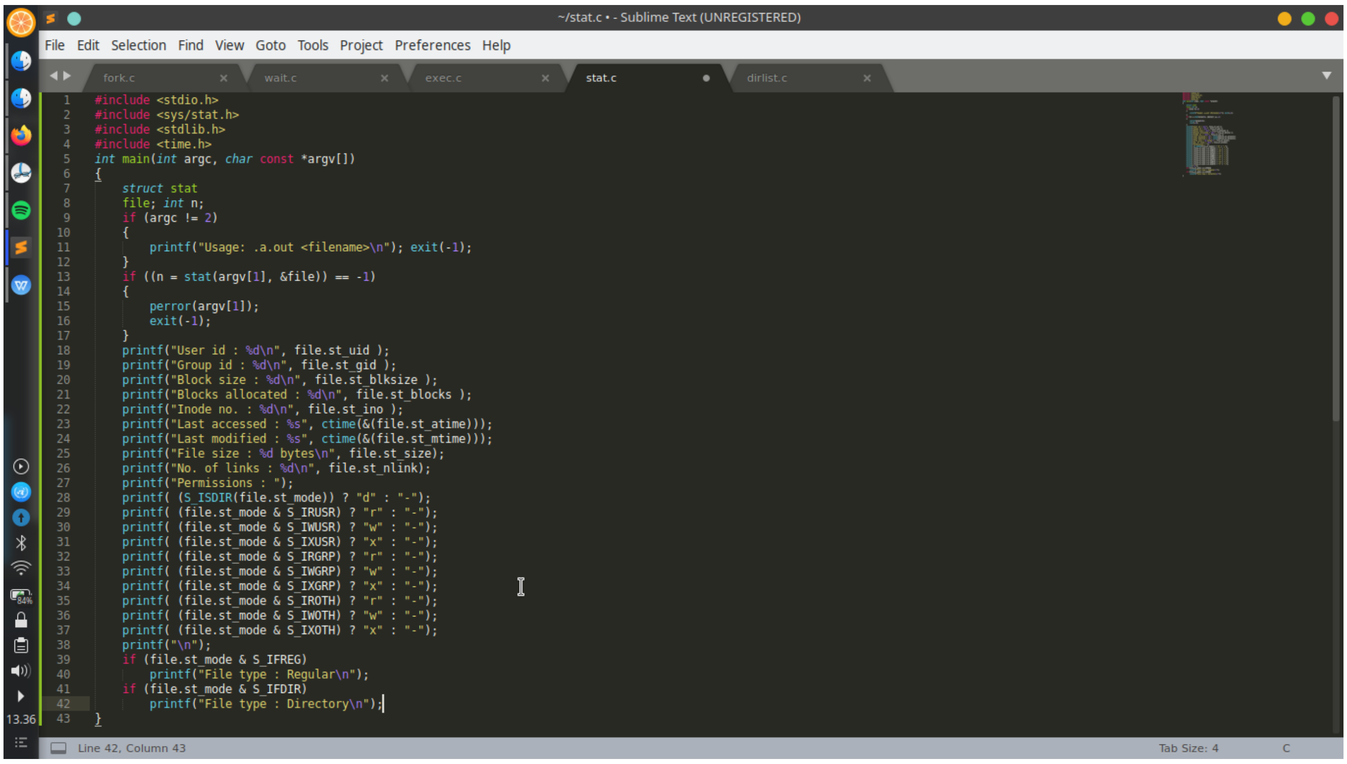


```
user@PC:~$ gcc exec.c
exec.c:5:1: warning: return type defaults to ‘int’ [-Wimplicit-int]
 main(int argc, char*argv[]) {
 ^~~~
exec.c: In function ‘main’:
exec.c:23:3: warning: missing sentinel in function call [-Wformat=]
   i = execl(argv[1], argv[2], 0);
   ^
exec.c:30:3: warning: implicit declaration of function ‘wait’; did you mean ‘main’? [-Wimplicit-fun
ction-declaration]
   wait(NULL);
   ^~~~
   main
user@PC:~$ ./a.out

Insufficient arguments to load program
Usage: ./a.out <path> <cmd>
user@PC:~$ ./a.out /bin/ls ls
Child process
 a.out     dirlist.c   eclipse-workspace   jjj.txt   Music      snap        Videos
 build     Documents   exec.c              latihan   Pictures   stat.c     'VirtualBox VMs'
 Desktop   Downloads   fork.c              Latihan   Public     Templates   wait.c
Child Terminated
user@PC:~$ 
```

4. Menampilkan status file menggunakan perintah system call ‘stat’

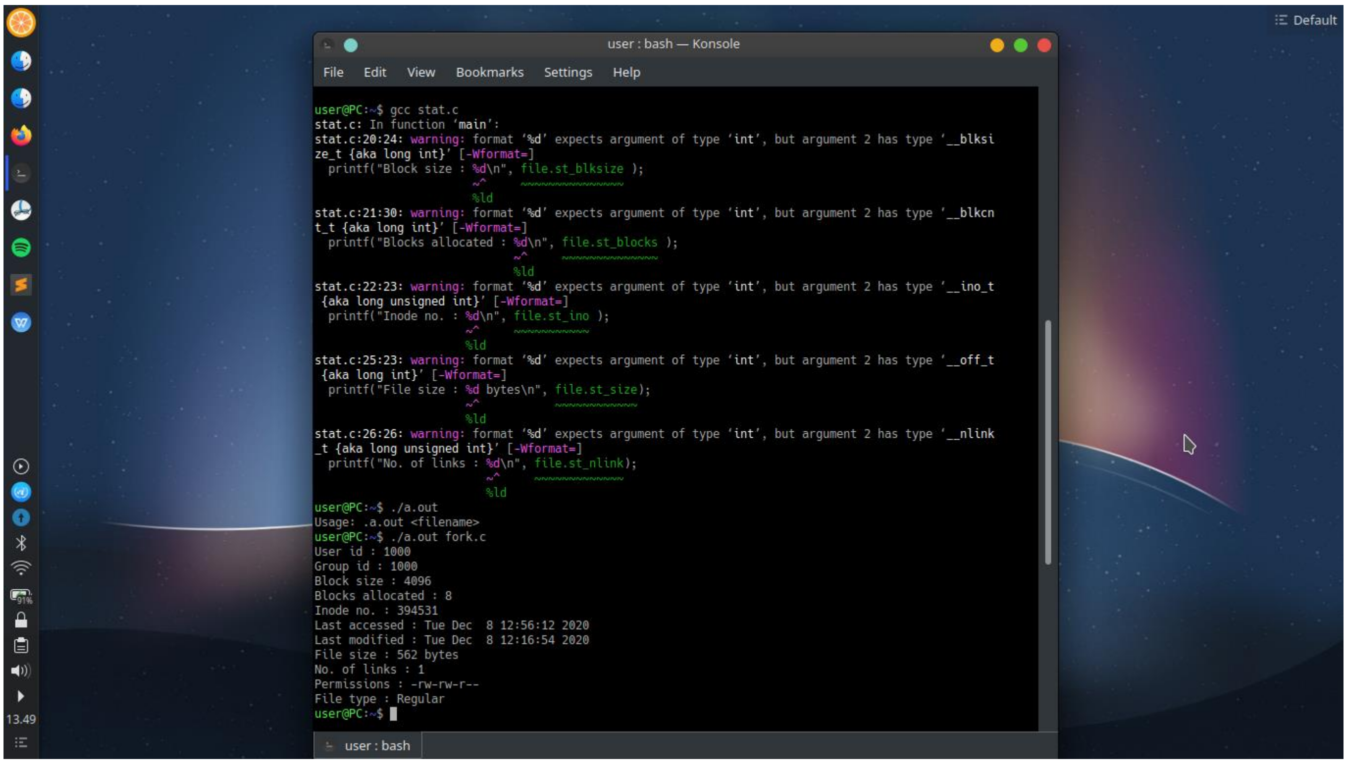
Kode Program stat.c



~/stat.c • - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
fork.c
wait.c
exec.c
stat.c
dirlist.c
Line 42, Column 43
Tab Size: 4
C
13.36

```c
#include <stdio.h>
#include <sys/stat.h>
#include <stdlib.h>
#include <time.h>
int main(int argc, char const *argv[])
{
    struct stat
    file; int n;
    if (argc != 2)
    {
        printf("Usage: .a.out <filename>\n"); exit(-1);
    }
    if ((n = stat(argv[1], &file)) == -1)
    {
        perror(argv[1]);
        exit(-1);
    }
    printf("User id : %d\n", file.st_uid );
    printf("Group id : %d\n", file.st_gid );
    printf("Block size : %d\n", file.st_blksize );
    printf("Blocks allocated : %d\n", file.st_blocks );
    printf("Inode no. : %d\n", file.st_ino );
    printf("Last accessed : %s", ctime(&(file.st_atime)));
    printf("Last modified : %s", ctime(&(file.st_mtime)));
    printf("File size : %d bytes\n", file.st_size);
    printf("No. of links : %d\n", file.st_nlink);
    printf("Permissions : ");
    printf( (S_ISDIR(file.st_mode)) ? "d" : "-");
    printf( (file.st_mode & S_IRUSR) ? "r" : "-");
    printf( (file.st_mode & S_IWUSR) ? "w" : "-");
    printf( (file.st_mode & S_IXUSR) ? "x" : "-");
    printf( (file.st_mode & S_IRGRP) ? "r" : "-");
    printf( (file.st_mode & S_IWGRP) ? "w" : "-");
    printf( (file.st_mode & S_IXGRP) ? "x" : "-");
    printf( (file.st_mode & S_IROTH) ? "r" : "-");
    printf( (file.st_mode & S_IWOTH) ? "w" : "-");
    printf( (file.st_mode & S_IXOTH) ? "x" : "-");
    printf("\n");
    if (file.st_mode & S_IFREG)
        printf("File type : Regular\n");
    if (file.st_mode & S_IFDIR)
        printf("File type : Directory\n");
}
```

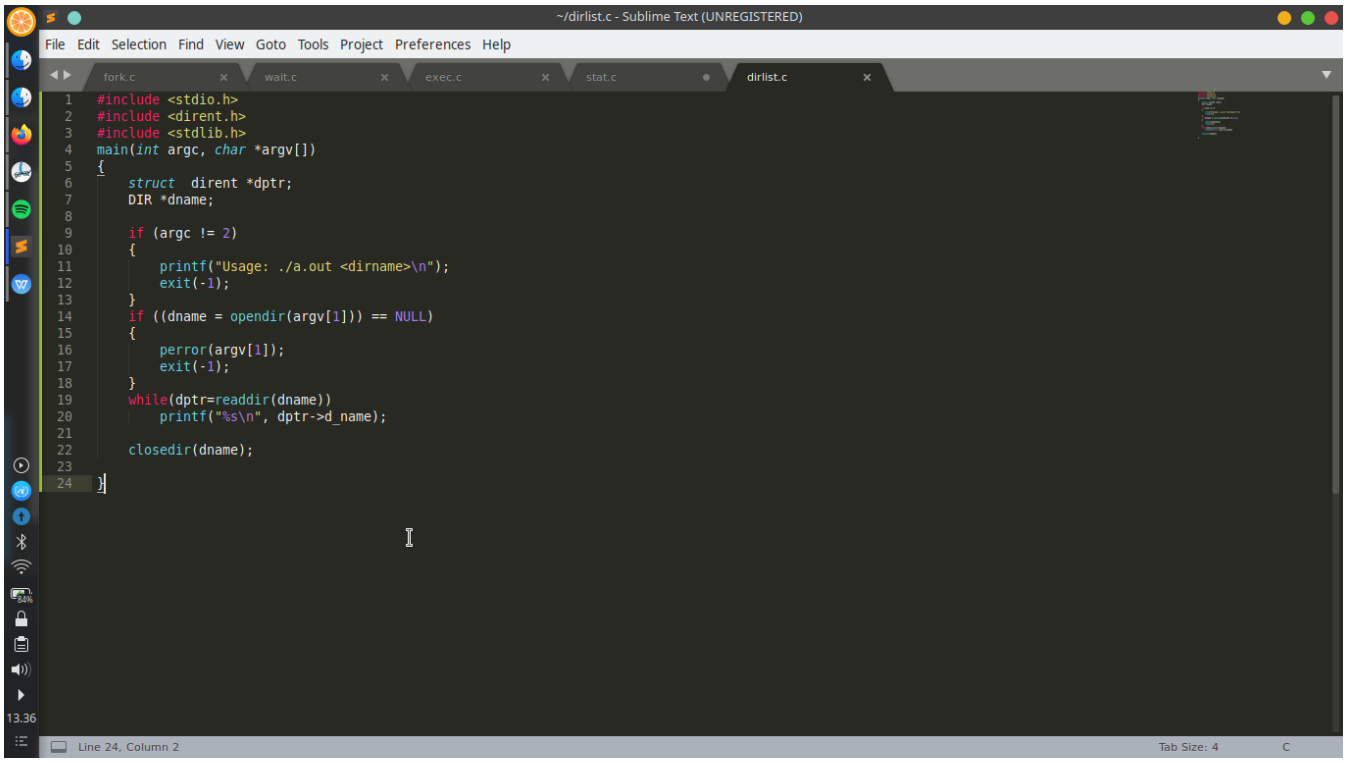
Memanggil melalui terminal



```
user@PC:~$ gcc stat.c
stat.c: In function ‘main’:
stat.c:20:24: warning: format ‘%d’ expects argument of type ‘int’, but argument 2 has type ‘__blksi
ze_t {aka long int}’ [-Wformat=]
  printf("Block size : %d\n", file.st_blksize );
                       ~^     ~~~~~~~~~~~~~~~
                       %ld
stat.c:21:30: warning: format ‘%d’ expects argument of type ‘int’, but argument 2 has type ‘__blkcn
t_t {aka long int}’ [-Wformat=]
  printf("Blocks allocated : %d\n", file.st_blocks );
                             ~^     ~~~~~~~~~~~~~~
                             %ld
stat.c:22:23: warning: format ‘%d’ expects argument of type ‘int’, but argument 2 has type ‘__ino_t
 {aka long unsigned int}’ [-Wformat=]
  printf("Inode no. : %d\n", file.st_ino );
                      ~^     ~~~~~~~~~~~
                      %ld
stat.c:25:23: warning: format ‘%d’ expects argument of type ‘int’, but argument 2 has type ‘__off_t
 {aka long int}’ [-Wformat=]
  printf("File size : %d bytes\n", file.st_size);
                      ~^           ~~~~~~~~~~~~
                      %ld
stat.c:26:26: warning: format ‘%d’ expects argument of type ‘int’, but argument 2 has type ‘__nlink
_t {aka long unsigned int}’ [-Wformat=]
  printf("No. of links : %d\n", file.st_nlink);
                         ~^     ~~~~~~~~~~~~~
                         %ld
user@PC:~$ ./a.out
Usage: .a.out <filename>
user@PC:~$ ./a.out fork.c
User id : 1000
Group id : 1000
Block size : 4096
Blocks allocated : 8
Inode no. : 394531
Last accessed : Tue Dec  8 12:56:12 2020
Last modified : Tue Dec  8 12:16:54 2020
File size : 562 bytes
No. of links : 1
Permissions : -rw-rw-r--
File type : Regular
user@PC:~$ 
```

5. Menampilkan isi direktori menggunakan perintah system call ‘readdir’

Kode Program dirlist.c



~/dirlist.c - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
fork.c
wait.c
exec.c
stat.c
dirlist.c
Line 24, Column 2
Tab Size: 4
C
13.36

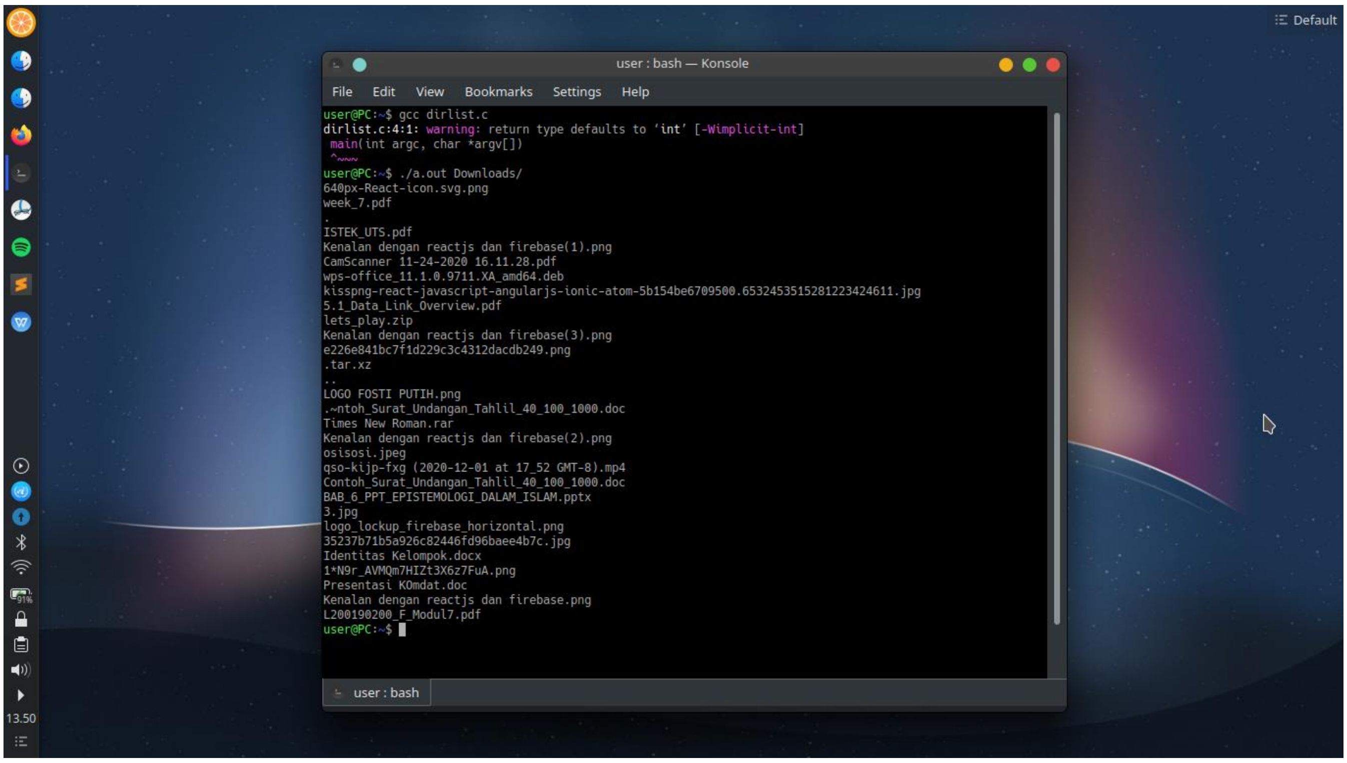
```c
#include <stdio.h>
#include <dirent.h>
#include <stdlib.h>
main(int argc, char *argv[])
{
    struct  dirent *dptr;
    DIR *dname;

    if (argc != 2)
    {
        printf("Usage: ./a.out <dirname>\n");
        exit(-1);
    }
    if ((dname = opendir(argv[1])) == NULL)
    {
        perror(argv[1]);
        exit(-1);
    }
    while(dptr=readdir(dname))
        printf("%s\n", dptr->d_name);

    closedir(dname);

}
```

Memanggil melalui terminal



```
user@PC:~$ gcc dirlist.c
dirlist.c:4:1: warning: return type defaults to ‘int’ [-Wimplicit-int]
 main(int argc, char *argv[])
 ^~~~
user@PC:~$ ./a.out Downloads/
640px-React-icon.svg.png
week_7.pdf
.
ISTEK_UTS.pdf
Kenalan dengan reactjs dan firebase(1).png
CamScanner 11-24-2020 16.11.28.pdf
wps-office_11.1.0.9711.XA_amd64.deb
kisspng-react-javascript-angularjs-ionic-atom-5b154be6709500.6532453515281223424611.jpg
5.1_Data_Link_Overview.pdf
lets_play.zip
Kenalan dengan reactjs dan firebase(3).png
e226e841bc7f1d229c3c4312dacdb249.png
.tar.xz
..
LOGO FOSTI PUTIH.png
.~ntoh_Surat_Undangan_Tahlil_40_100_1000.doc
Times New Roman.rar
Kenalan dengan reactjs dan firebase(2).png
osisosi.jpeg
qso-kijp-fxg (2020-12-01 at 17_52 GMT-8).mp4
Contoh_Surat_Undangan_Tahlil_40_100_1000.doc
BAB_6_PPT_EPISTEMOLOGI_DALAM_ISLAM.pptx
3.jpg
logo_lockup_firebase_horizontal.png
35237b71b5a926c82446fd96baee4b7c.jpg
Identitas Kelompok.docx
1*N9r_AVMQm7HIZt3X6z7FuA.png
Presentasi KOmdat.doc
Kenalan dengan reactjs dan firebase.png
L200190200_F_Modul7.pdf
user@PC:~$
```