

# **LAPORAN PRAKTIKUM SISTEM OPERASI**



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TAHUN AJARAN 2021/2022**

# Lembar Kerja Praktikum

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Nama Asisten	: -	Tanda Tangan :
	-	
Tanggal Praktikum	: 06/12/2022	

1. Membuat sebuah Child Process dengan menggunakan system call "fork"

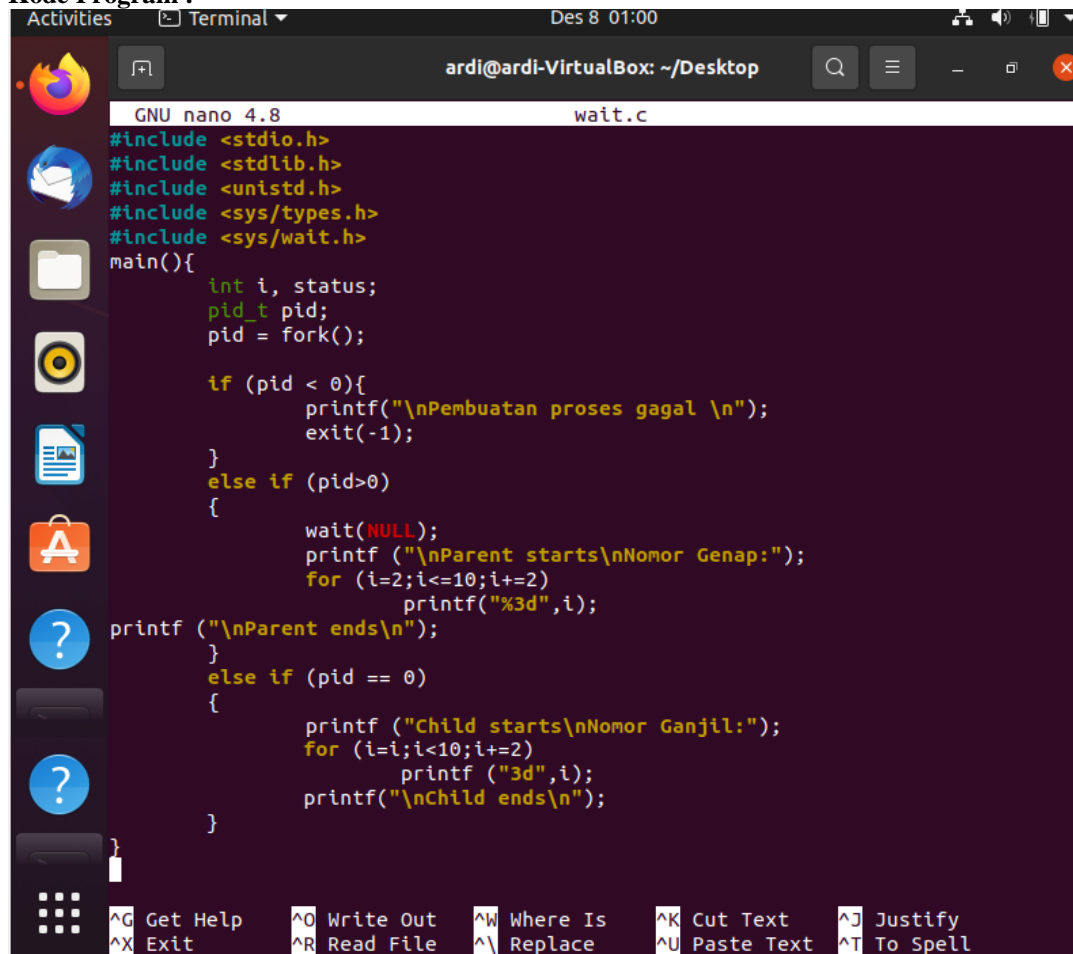
## Kode Program :

```
GNU nano 4.8 fork.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", getppid());
    }
    else
    {
        printf("Parent process:");
        printf("\nProcess id is %d", getpid());
        printf("\nValue of x is %d", x);
        printf("\nProcess id of shell is %d\n", getppid());
    }
}
```

```
ardi@ardi-VirtualBox:~/Desktop$ nano fork.c
ardi@ardi-VirtualBox:~/Desktop$ gcc fork.c
fork.c:5:1: warning: return type defaults to 'int' [-Wimplicit-int]
5 | main(){
  | ~~~~~
fork.c: In function 'main':
fork.c:26:51: warning: unknown conversion type character '\x0a' in format [-Wformat=]
26 |         printf("\nProcess id of shell is %d\n", getppid());
   |                                     ~~~~~
fork.c:26:24: warning: too many arguments for format [-Wformat-extra-args]
26 |         printf("\nProcess id of shell is %d\n", getppid());
   |                                     ~~~~~
ardi@ardi-VirtualBox:~/Desktop$ ./a.out
Parent process:
Process id is 7631
Value of x is 6
Process id of shell is %
ardi@ardi-VirtualBox:~/Desktop$ Child process:
Process id is 7632
Value of x is 6
Process id of parent is 1212
```

2. Menghentikan sementara (block) proses parent sampai dengan proses chile selesai, menggunakan perintah system call "wait"

#### Kode Program :



```
GNU nano 4.8 wait.c
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/types.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");
    }
}
```

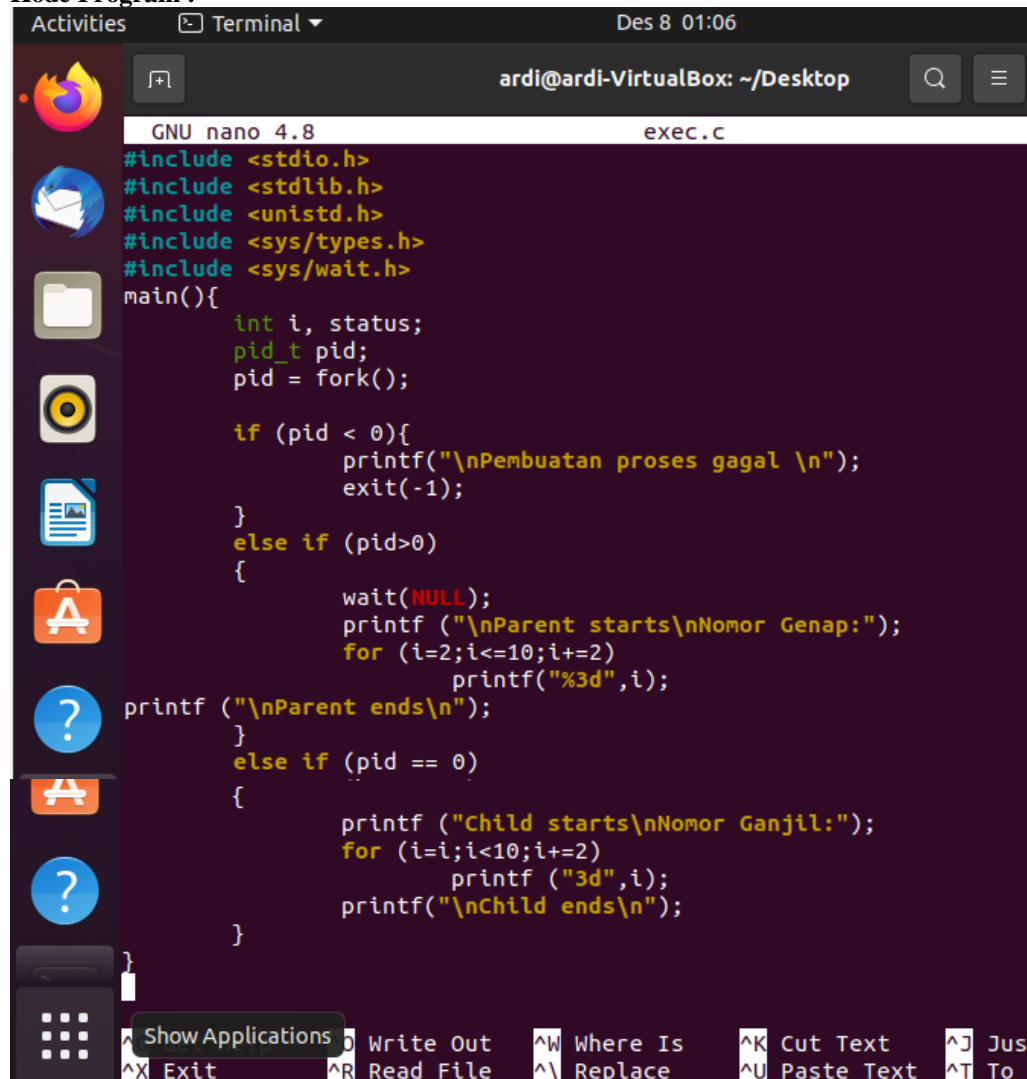


```
ardi@ardi-VirtualBox:~/Desktop$ nano wait.c
ardi@ardi-VirtualBox:~/Desktop$ gcc wait.c
wait.c:6:1: warning: return type defaults to 'int' [-Wimplicit-int]
6 | main(){
  | ~~~~~
wait.c: In function 'main':
wait.c:27:33: warning: too many arguments for format [-Wformat-extra-args]
27 |         printf ("3d",i);
    |         ~~~~~
ardi@ardi-VirtualBox:~/Desktop$ ./a.out
Child starts
Nomor Ganjil:3d3d3d3d3d
Child ends

Parent starts
Nomor Genap: 2 4 6 8 10
Parent ends
ardi@ardi-VirtualBox:~/Desktop$
```

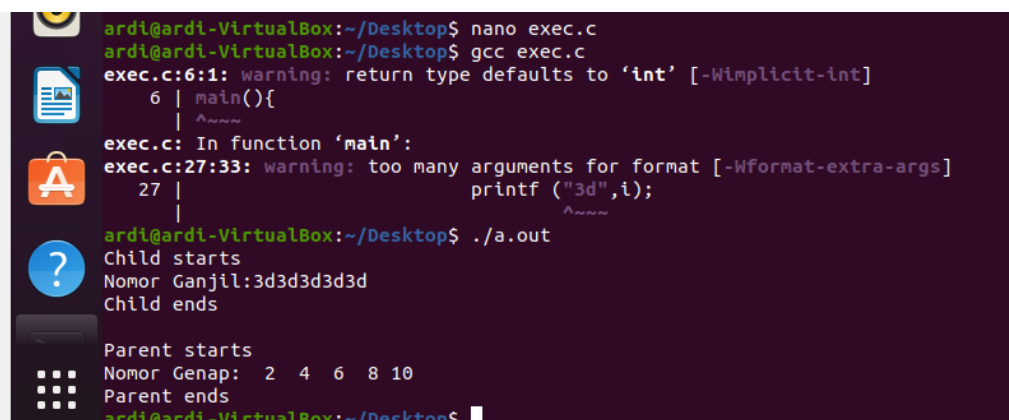
3. Loading program yang dapat dieksekusi dalam sebuah “child” proses menggunakan perintah system call “exec”

**Kode Program :**



```
GNU nano 4.8                                exec.c
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/types.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");
    }
}
```



```
ardi@ardi-VirtualBox:~/Desktop$ nano exec.c
ardi@ardi-VirtualBox:~/Desktop$ gcc exec.c
exec.c:6:1: warning: return type defaults to 'int' [-Wimplicit-int]
6 | main(){
  | ^~~~~~
exec.c: In function 'main':
exec.c:27:33: warning: too many arguments for format [-Wformat-extra-args]
27 |         printf ("3d",i);
    |         ~~~~~~^~~~~~
ardi@ardi-VirtualBox:~/Desktop$ ./a.out
Child starts
Nomor Ganjil:3d3d3d3d3d
Child ends

Parent starts
Nomor Genap: 2 4 6 8 10
Parent ends
ardi@ardi-VirtualBox:~/Desktop$
```

4. Menampilkan status file menggunakan perintah system call “stat”

**Kode Program, :**

```
Activities Terminal Des 8 01:18
ardi@ardi-VirtualBox: ~/Desktop
GNU nano 4.8 stat.c
#include <stdio.h>
#include <sys/stat.h>
#include <stdlib.h>
#include <time.h>
int main(int argc, char*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");
}
```

```
ardi@ardi-VirtualBox:~/Desktop$ nano stat.c
ardi@ardi-VirtualBox:~/Desktop$ gcc stat.c
stat.c: In function 'main':
stat.c:19:24: warning: format '%d' expects argument of type 'int', but argument
2 has type '__blksize_t' {aka 'long int'} [-Wformat=]
19 | printf("Block size : %d\n", file.st_blksize);
   |                        ~^      ~~~~~
   |                        |      |
   |                        int   __blksize_t {aka long int}
   |                        %ld
stat.c:20:37: warning: format '%d' expects argument of type 'int', but argument
2 has type '__blkcnt_t' {aka 'long int'} [-Wformat=]
20 | printf("Blocks allocated : %d\n", file.st_blocks);
   |                        ~^      ~~~~~
   |                        |      |
   |                        int   __blkcnt_t {aka long int}
   |                        %ld
stat.c:21:23: warning: format '%d' expects argument of type 'int', but argument
2 has type '__ino_t' {aka 'long unsigned int'} [-Wformat=]
21 | printf("Inode no. : %d\n", file.st_ino);
   |                        ~^      ~~~~~
   |                        |      |
   |                        int   __ino_t {aka long unsigned int}
   |                        %ld
stat.c:24:23: warning: format '%d' expects argument of type 'int', but argument
2 has type '__off_t' {aka 'long int'} [-Wformat=]
24 | printf("File size : %d bytes\n", file.st_size);
```

```
stat.c:24:23: warning: format '%d' expects argument of type 'int', but argument
2 has type '__off_t' {aka 'long int'} [-Wformat=]
24 | printf("File size : %d bytes\n", file.st_size);
    |                   ~^
    |                   |
    |                   int
    |                   |
    |                   __off_t {aka long int}
    |                   %ld

stat.c:25:26: warning: format '%d' expects argument of type 'int', but argument
2 has type '__nlink_t' {aka 'long unsigned int'} [-Wformat=]
25 | printf("No. of links : %d\n", file.st_nlink);
    |                   ~^
    |                   |
    |                   int
    |                   |
    |                   __nlink_t {aka long unsigned int}
    |                   %ld

ardi@ardi-VirtualBox:~/Desktop$ ./a.out stat.c
U      d : 1000
G      id : 1000
Block size : 4096
Blocks allocated : 8
Inode no. : 163805
Last accessed : Thu Dec  8 01:16:05 2022
Last modified : Thu Dec  8 01:15:55 2022
File size : 1384 bytes
No. of links : 1
Permissions : -rw-rw-r--
File type : Regular
ardi@ardi-VirtualBox:~/Desktop$
```

5. Menampilkan isi direktori menggunakan perintah system call “readdir”  
**Kode Program :**

```
Activities  Terminal  Des 8 01:25
ardi@ardi-VirtualBox: ~/Desktop
GNU nano 4.8  dirlist.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);
}
```

```
ardi@ardi-VirtualBox:~/Desktop$ nano dirlist.c
ardi@ardi-VirtualBox:~/Desktop$ gcc dirlist.c
dirlist.c:4:1: warning: return type defaults to 'int' [-Wimplicit-int]
4 | main(int argc, char *argv[]){
  | ^~~~~

ardi@ardi-VirtualBox:~/Desktop$ ./a.out Music
Music: No such file or directory
ardi@ardi-VirtualBox:~/Desktop$ ./a.out
Usage: ./a.out <dirname>
ardi@ardi-VirtualBox:~/Desktop$ ./a.out Downloads
Downloads: No such file or directory
ardi@ardi-VirtualBox:~/Desktop$
```