

# **LAB 11 ASSIGNMENT**

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**Aim:** Implementation of custom linux shell.

**1). Write a program to achieve functionality of shell.**

**CODE:**

```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <fcntl.h>
#include <string.h>
#include <wait.h>
void main()
{
    char his[100][25];
    int ptr = 0;
    while (1)
    {
        char input[500];
        printf("\nBirva $:");
        scanf("%[^\n]%*c", input);
        if (strlen(input) == 0)
            continue;
        strcpy(his[ptr++], input);
        pid_t pid = fork();
```

```

if (pid == 0)
{
    if (strcmp(input, "history") == 0)
    {
        for (int i = 0; i < ptr; i++)
        {
            printf("%s\n", his[i]);
        }
        continue;
    }
    else if (strcmp(input, "ls|sort") == 0)
    {
        int pipefd[2];
        int status = pipe(pipefd);
        if (status == -1)
        {
            printf("Error in creating pipe");
            return;
        }
        pid_t pid;
        pid = fork();
        if (pid == -1)
        {
            printf("ERROR IN FORK");
            return;
        }
        if (pid != 0)
        {
            wait(NULL);
            close(pipefd[1]);
            int status = dup2(pipefd[0], 0);
            int s = execl("/bin/sort", "sort", (char *)NULL);
            if (s == -1)
            {

```

```

        printf("ERROR");
    }
}
if (pid == 0)
{
    close(pipefd[0]);
    int status = dup2(pipefd[1], 1);
    int s = execl("/bin/ls", "ls", (char *)NULL);
    if (s == -1)
    {
        printf("ERROR");
    }
}
}
else
{
    char path[500] = "/bin/";
    int count = 0;
    for (int i = 0; i < strlen(input); i++)
    {
        char t = input[i];
        if (t == ' ')
            count++;
    }
    char *cmd[count + 2];
    cmd[0] = (char *)malloc(20);
    for (int i = 0, j = 0, k = 0; i < strlen(input); i++)
    {
        if (input[i] != ' ')
        {
            cmd[j][k] = input[i];
            k++;
        }
        else

```

```

        {
            cmd[j][k] = '\0';
            j++;
            k = 0;
            cmd[j] = (char *)malloc(20);
        }
    }
    cmd[count + 1] = NULL;
    strcat(path, cmd[0]);
    int s = execv(path, cmd);
    if (s == -1)
    {
        printf("-shell: %s: command not found", input);
    }
}

else if (pid != 0)
{
    wait(NULL);
}

else if (pid == -1)
{
    printf("ERROR");
}

}

}

```

## OUTPUT:

```
birva@LAPTOP-TJ5C014G:/mnt/c/Users/Admin/Documents/OS/LAB-11$ ls
010_11.docx  a.out  task1.c  '~$010_11.docx'
birva@LAPTOP-TJ5C014G:/mnt/c/Users/Admin/Documents/OS/LAB-11$ ls -l
total 36
-rwxrwxrwx 1 birva birva 12246 Oct  7 01:06 010_11.docx
-rwxrwxrwx 1 birva birva 17360 Oct  7 19:40 a.out
-rwxrwxrwx 1 birva birva  2232 Oct  7 12:14 task1.c
-rwxrwxrwx 1 birva birva   162 Oct  7 19:32 '~$010_11.docx'
birva@LAPTOP-TJ5C014G:/mnt/c/Users/Admin/Documents/OS/LAB-11$ ls -a
.  ..  010_11.docx  a.out  task1.c  '~$010_11.docx'
birva@LAPTOP-TJ5C014G:/mnt/c/Users/Admin/Documents/OS/LAB-11$ ls | sort
010_11.docx
a.out
task1.c
~$010_11.docx
birva@LAPTOP-TJ5C014G:/mnt/c/Users/Admin/Documents/OS/LAB-11$ pwd
/mnt/c/Users/Admin/Documents/OS/LAB-11
birva@LAPTOP-TJ5C014G:/mnt/c/Users/Admin/Documents/OS/LAB-11$ ls-a
ls-a: command not found
birva@LAPTOP-TJ5C014G:/mnt/c/Users/Admin/Documents/OS/LAB-11$ cat
abc
abc
^C
birva@LAPTOP-TJ5C014G:/mnt/c/Users/Admin/Documents/OS/LAB-11$
```

```
birva@LAPTOP-TJ5C014G:/mnt/c/Users/Admin/Documents/OS/LAB-11$ gcc task1.c
```

```
birva@LAPTOP-TJ5C014G:/mnt/c/Users/Admin/Documents/OS/LAB-11$ ./a.out
```

```
Birva $:ls
```

```
010_11.docx  a.out  task1.c  '~$010_11.docx'
```

```
Birva $:ls -l
```

```
total 36
```

```
-rwxrwxrwx 1 birva birva 12246 Oct  7 01:06 010_11.docx
```

```
-rwxrwxrwx 1 birva birva 17360 Oct  7 19:40 a.out
```

```
-rwxrwxrwx 1 birva birva  2232 Oct  7 12:14 task1.c
```

```
-rwxrwxrwx 1 birva birva   162 Oct  7 19:32 '~$010_11.docx'
```

```
Birva $:ls -a
```

```
.  ..  010_11.docx  a.out  task1.c  '~$010_11.docx'
```

```
Birva $:ls-l
```

```
-shell: ls-l: command not found
```

```
Birva $:pwd
```

```
/mnt/c/Users/Admin/Documents/OS/LAB-11
```

```
Birva $:history
```

```
ls
```

```
ls -l
```

```
ls -a
```

```
ls-l
```

```
pwd
```

```
history
```

```
Birva $:cat
```

```
abc
```

```
abc
```

```
^C
```

```
birva@LAPTOP-TJ5C014G:/mnt/c/Users/Admin/Documents/OS/LAB-11$
```