

Assignment No. 1

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Title:-

Write a program to simulate use of Linux commands like cp, grep with the usage of fork () and exec () system calls. Also show the usage of wait (), getpid () and exit () system calls.

Code :-

calls.c

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
#include <unistd.h>
```

```
#include <sys/wait.h>
```

```
void simulate_cp(const char *source, const char *destination) {  
    pid_t pid = fork();  
    if (pid < 0) {  
        perror("Fork failed");  
        exit(EXIT_FAILURE);  
    } else if (pid == 0) {  
        printf("Child (cp): PID=%d, Parent PID=%d\n", getpid(), getppid());  
        execlp("./mycp", "mycp", source, destination, NULL);  
        perror("execlp failed");  
        exit(EXIT_FAILURE);  
    } else {  
        wait(NULL);  
        printf("\nParent: Completed cp command.\n");  
    }  
}
```

```
void simulate_grep(const char *pattern, const char *file) {  
    pid_t pid = fork();  
    if (pid < 0) {
```

```

    perror("Fork failed");
    exit(EXIT_FAILURE);
} else if (pid == 0) {
    printf("Child (grep): PID=%d, Parent PID=%d\n", getpid(), getppid());
    execlp("./mygrep", "mygrep", pattern, file, NULL);
    perror("execlp failed");
    exit(EXIT_FAILURE);
} else {
    wait(NULL);
    printf("\nParent: Completed grep command.\n");
}
}

```

```

int main() {
    int ch;
    char source[100], destination[100], pattern[100], file[100];

    do {
        printf("Select a command to simulate:\n");
        printf("1. cp (copy file)\n");
        printf("2. grep (search pattern in file)\n");
        printf("3. Exit Program\n");
        printf("Enter your choice: ");
        scanf("%d", &ch);

        switch (ch) {
            case 1:
                printf("Enter source file: ");
                scanf("%s", source);
                printf("Enter destination file: ");
                scanf("%s", destination);
                simulate_cp(source, destination);
                break;

```

case 2:

```
printf("Enter pattern to search: ");
scanf("%s", pattern);
printf("Enter file to search in: ");
scanf("%s", file);
simulate_grep(pattern, file);
break;
```

case 3:

```
printf("Thank you For Visiting Us ");
break;
```

```
}
```

```
} while(ch != 3);
```

```
printf("\nParent: All processes completed. Exiting...\n");
```

```
return 0;
```

```
}
```

mygrep.c

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
#include <string.h>
```

```
int main(int argc, char *argv[]) {
```

```
    if (argc != 3) {
```

```
        printf("Please Enter Correct Command !!!");
```

```
        exit(EXIT_FAILURE);
```

```
    }
```

```
    char *pattern = argv[1];
```

```
    char *filename = argv[2];
```

```

FILE *file = fopen(filename, "r");
if (!file) {
    printf("No File Found, Error in Opening File !!! \n");
    exit(EXIT_FAILURE);
}

char line[1000];

printf("Searching for pattern '%s' in '%s'...\n", pattern, filename);

while (fgets(line, sizeof(line), file)) {
    if (strstr(line, pattern)) {
        printf("%s", line);
    }
}

fclose(file);
return 0;
}

```

mycp.c

```

#include <stdio.h>
#include <stdlib.h>

int main(int argc, char *argv[]) {
    if (argc != 3) {
        printf("Please Enter Correct Command !!!");
        exit(EXIT_FAILURE);
    }

    char *srcFile = argv[1];
    char *destFile = argv[2];

```

```
FILE *src = fopen(srcFile, "r");
if (!src) {
    printf("Error in Opening Source File");
    exit(EXIT_FAILURE);
}

FILE *dest = fopen(destFile, "w");
if (!dest) {
    printf("Error in Opening Destination File");
    fclose(src);
    exit(EXIT_FAILURE);
}

char buffer[1000];
int bytes;

while (( bytes = fread(buffer, 1, 1000, src) ) > 0) {
    if ( fwrite(buffer, 1, bytes, dest) != bytes ) {
        printf("Error writing to destination file");
        fclose(src);
        fclose(dest);
        exit(EXIT_FAILURE);
    }
}

fclose(src);
fclose(dest);

printf("File copied successfully from '%s' to '%s'.\n", srcFile, destFile);
return 0;
}
```

OUTPUT :-

```
pccoe@pccoe:~/122B1B275$ gcc calls.c -o calls
pccoe@pccoe:~/122B1B275$ ./calls
Select a command to simulate:
1. cp (copy file)
2. grep (search pattern in file)
3. Exit Program
Enter your choice: 1
Enter source file: file1
Enter destination file: file2
Child (cp): PID=4468, Parent PID=4467
File copied successfully from 'file1' to 'file2'.

Parent: Completed cp command.
Select a command to simulate:
1. cp (copy file)
2. grep (search pattern in file)
3. Exit Program
Enter your choice: 2
Enter pattern to search: PCCOE
Enter file to search in: file1
Child (grep): PID=4469, Parent PID=4467
Searching for pattern 'PCCOE' in 'file1'...
Hi, I am PCCOE Student.
PCCOE is Best Engineering College in Pune.

Parent: Completed grep command.
Select a command to simulate:
1. cp (copy file)
2. grep (search pattern in file)
3. Exit Program
Enter your choice: 3
Thank you For Visiting Us
Parent: All processes completed. Exiting...
pccoe@pccoe:~/122B1B275$
```