UE20CS254: Operating System
Assignments (Week 1 - Week 5)

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Week 1:

Code:

```
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-1$ ls
p1  p1.c  p2  p2.c
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-1$ cat p1.c
// write a program that accepts 2 integers x and y. Now use exec to execute another user defined program that
prints the sum of x and y.
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <sys/wait.h>
#include <unistd.h>
int main() {
        printf("This is p1.c\n");
        char x[100], y[100];
        printf("Enter x: ");
        scanf("%s", x);
        printf("Enter y: ");
        scanf("%s", y);
        char* s[] = {x, y, NULL};
        printf("Calling p2.c to calc sum....\n");
        execv("./p2", s);
}
```

```
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-1$ cat p2.c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <sys/wait.h>
#include <unistd.h>

int main(int argc, char *argv[]) {
        char *x = argv[0];
        char *y = argv[1];
        int sum = atoi(x) + atoi(y);
        printf("Executed p2.c\nNow finding the sum....\n");
        printf("Sum of x and y: %d\n", sum);
        return 0;
}
```

Output Screenshots:

```
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-1$ gcc p1.c -o p1
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-1$ gcc p2.c -o p2
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-1$ ./p1
This is p1.c
Enter x: 2
Enter y: 5
Calling p2.c to calc sum....
Executed p2.c
Now finding the sum....
Sum of x and y: 7
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-1$
```

Week 2:

Code:

```
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-2$ cat p1.c
// Using pipes concatenate 2 strings
// one process takes in the string as input and writes it to the pipe
// 2nd process reads from pipe and concatenates it with other string
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <sys/types.h>
#include <sys/wait.h>
#include <unistd.h>

int main()
{
        int fd1[2];
        int fd2[2];
        pid_t p;

        if (pipe(fd1) == -1) {
                fprintf(stderr, "pipe failed");
                return 1;
        }
        if (pipe(fd2) == -1) {
                fprintf(stderr, "pipe failed");
                return 1;
        }

        char str1[100];
        printf("enter string 1: ");
```

```
        scanf("%s", str1);
        char str2[100];
        printf("enter string 2: ");
        scanf("%s", str2);
        p = fork();
        if (p < 0) {
                fprintf(stderr, "fork failed");
                return 1;
        }
        else if (p > 0) {
                char str3[100];
                close(fd1[0]);
                write(fd1[1], str1, strlen(str1) + 1);
                close(fd1[1]);
                wait(NULL);
                close(fd2[1]);
                read(fd2[0], str3, 100);
                printf("Concatenated string: %s\n", str3);
                close(fd2[0]);
        }
        else {
                close(fd1[1]);
                char str3[100];
                read(fd1[0], str3, 100);
                int k = strlen(str3);
                int i;
                for (i = 0; i < strlen(str2); i++)
                        str3[k++] = str2[i];
```

```
                int i;
                for (i = 0; i < strlen(str2); i++)
                        str3[k++] = str2[i];
                str3[k] = '\0';
                close(fd1[0]);
                close(fd2[0]);
                write(fd2[1], str3, strlen(str3) + 1);
                close(fd2[1]);
                exit(0);
        }
}
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-2$
```

Output Screenshots:

```
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-2$ gcc p1.c
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-2$ ./a.out
enter string 1: hello_
enter string 2: world
Concatenated string: hello_world
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-2$
```

Week 3:

Code:

```
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-3$ cat p1.c
// WAP a C program to simulate paging
//
// take input:
// size of physical memory
// size of logical memory
// partition size
// logical address
// base address
// calc physical address: phy addr = base addr + (frame number * frame size) + offset
#include <stdio.h>
int main() {
        int phy_size;
        int log_size;
        int partition_size;
        int log_addr;
        int base_addr;
        int phy_addr;
        printf("enter the size of physical memory, size of logical memory, partition size, logical address, ba
se address: \n");
        scanf("%d %d %d %d %d", &phy_size, &log_size, &partition_size, &log_addr, &base_addr);
        int total_frames = phy_size/partition_size;
        int frame_size = partition_size;
        int frame_no = log_addr;
        int offset = 5;
        phy_addr = base_addr + (frame_no * frame_size) + offset;
        printf("Physical address = %d\n", phy_addr);
}
```

Output Screenshots:

```
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-3$ ./a.out
enter the size of physical memory, size of logical memory, partition size, logical address, base address:
10000
500
35
12
2
Physical address = 427
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-3$
```

Week 4:

Code:

```
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-4$ cat p1.c
#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <unistd.h>
#include <time.h>
#include <dirent.h>
#include <string.h>

int main (int argc, char **argv) {
    if(argc != 5) {
        printf("Format Error! \n");
        printf("Follow the following format : ./executable.out /full/absolute/path/ DD MM YYYY \n");
        printf("Note that the / after full path is ver important");
        return 0;
    }

    int day = atoi(argv[2]);
    int mon = atoi(argv[3]);
    int yer = atoi(argv[4]);

        struct stat attrib;
    DIR* d = opendir(argv[1]);
    struct dirent* filefo_path;

        while((filefo_path = readdir(d))!=NULL){
        char temp[1000];
```

```
        while((filefo_path = readdir(d))!=NULL){
        char temp[1000];
        strcpy(temp, argv[1]);
        strcat(temp, filefo_path -> d_name);
        stat(temp, &attrib);
        struct tm* time_struct = gmtime(&attrib.st_ctime);
        if(time_struct -> tm_year + 1900 >= yer && time_struct -> tm_mday > day && time_struct -> tm_mon + 1 >
= mon){
            printf("%s %d %d %d \n", temp, time_struct -> tm_mday, time_struct -> tm_mon + 1, time_struct -> t
m_year + 1900);
        }
    }
        return 0;
}
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-4$
```

Output Screenshots:

```
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-4$ vim p1.c
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-4$ gcc p1.c
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-4$ ./a.out /mnt/c/Us
ers/Vishwa/Documents/Vishwa_PES/Sem4/OS 26 01 2022
/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/. 30 4 2022
/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/.. 29 4 2022
/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS Notes 28 4 2022
/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn 30 4 2022
/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_Project 30 4 2022
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-4$
```

```
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-4$ vim p1.c
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-4$ gcc p1.c
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-4$ ./a.out /mnt/c/Us
ers/Vishwa/Documents/Vishwa_PES/Sem4/OS/ 28 04 2022
/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/. 30 4 2022
/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/.. 29 4 2022
/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn 30 4 2022
/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_Project 30 4 2022
vishwa@Acer-Vishwa:/mnt/c/Users/Vishwa/Documents/Vishwa_PES/Sem4/OS/OS_HandsOn/Assignment-4$
```

Week 5:

Code:

```
vishwa@vishwa-VirtualBox:~/Documents/Assignment-5$ cat p2.c
#include<stdio.h>
#include<dirent.h>
#include<sys/types.h>
#include<sys/stat.h>
#include<time.h>
#include<string.h>
#include<stdlib.h>

int main() {
        DIR *dir;
        struct dirent *dirent;
        struct stat statbuf;
        char path[100];
        char date[100];
        printf("Enter the path: ");
        scanf("%s", path);
        printf("Enter the date in dd/mm/yyyy format: ");
        scanf("%s", date);
        printf("Enter access modes as a 4 digit number:");
        int mode = scanf("%d", &mode);
        dir = opendir(path);
        if(dir == NULL) {
               printf("Error in opening the directory\n");
               return 1;
        }

        while((dirent = readdir(dir)) != NULL) {
                if(stat(dirent->d_name,&statbuf) == -1) {
                        printf("Error in stat\n");
                        return 1;
                }

                if(strcmp(date,ctime(&statbuf.st_ctime)) <= 0) {
                       printf("%s\n", dirent->d_name);
```

```
                if(strcmp(date,ctime(&statbuf.st_ctime)) <= 0) {
                       printf("%s\n", dirent->d_name);
                       chmod(path, mode);
                }
        }
        closedir(dir);
        return 0;
}
vishwa@vishwa-VirtualBox:~/Documents/Assignment-5$
```

Output Screenshots: