Lab Mid

Course Code: CL205	**Course Name: Operating Systems Lab**
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Student Roll No:	**Section:**

"If there is something, you don't know today. You will surely learn afterwards. Life is not an exam hall."
BEST OF LUCK!

Instructions

- Rules are made to break them. So, invent yours and I'll break.

Time: 90 minutes **Max Marks:** 60 points

Write single bash command in first line and also execlp() system call for that command in second line for each of the following: **(10 marks)**

1. Display lines from planets.txt which has the term 'earth' in the line and put the output to the file 'search_result.txt'

2. Change permission of a directory 'confidential_data' such that owner have only read and write permissions and group have read permission and other have only execute permission.

3. Make the following directory, assume you are in your Desktop

OSLAB/OSLAB-Week9/OSLABMID

4. Copy the directory from /home/student/myDatum to /usr/local/myProg/

5. Create a hard link of the file 'shared_file.txt' which is present in the directory '/usr/local/myProg/Public' to /home/student/Desktop the name of the link should be 'shmfile_link'

Below is the code of shell script which is incorrect. Mark the error and correct them. **(5 marks)**

```
void add(int a, int b) {
        [[result = $a + $b]]
        return result
}
int sub() {
        [[result = n1 – n2]];
}
read -p "Enter two Numbers: " n1 n2
read -p "Enter 1 for addition or 2 for subtraction: " sel
if [$sel='1'] then
        add n1 n2
        echo "Result is $result"
else if [$sel=2] then
        sub n1 n2
        echo "Result is $result"
else
        echo "Error, Invalid Input"
fi
```

This program will create ____ child processes and ____ threads? **(4 marks)**

```
 int main()
{
    fork();
    pthread_create(&tid, NULL, thread, NULL);
    fork();
    pthread_create(&tid, NULL, thread, NULL);
    pthread_create(&tid, NULL, thread, NULL);
    fork();
    pthread_create(&tid, NULL, thread, NULL);
    return 0;
}
```

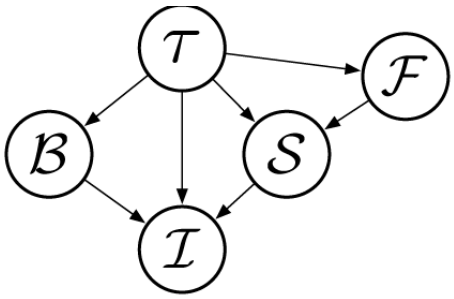
What is the difference between the two program? **(3 marks)**

```
pthread_t t[N];
 for (i = 0; i < N; i++)
 pthread_create(&t[i], NULL, thread_func,
NULL);
 for (i = 0; i < N; i++)
 pthread_join(t[i], NULL);
```

```
pthread_t t[N];
 for (i = 0; i < N; i++) {
 pthread_create(&t[i], NULL,
 thread_func, NULL);
 pthread_join(t[i], NULL);
 }
```

Suppose that we have five C functions that together solve some problem. Suppose these function depend on each other according to the following dependency graph. For example, the edge from node B to node I means that functionB must be called, and must return, before functionI can be called.

Write a sketch of a C program that uses Pthreads to execute the above six functions in a way that is maximally parallel, but adheres to the above dependency graph. **(7 marks)**



True or false: Code in an OpenMP program that is not covered by a pragma is executed by all threads. **(1 marks)**

You have a computer with 4 cores. Use OpenMP to parallelize a for-loop that initializes to zero the lowerr triangle of a 100× 100 matrix and initializes 1 to the upper triangle. **(5 marks)**

The following code outlines a synchronization pattern. Assume that the two threads begin at the same time. In what way are the two threads synchronized? Give your answer in terms of how the three calculations, A, B, and C, are ordered in time. Explain carefully what role each of the three semaphores plays in the synchronization. **(3 marks)**

```
void *thread1(void *vargp)
{ while(1)
{ << do Calculation A >>
sem_post(&semaphore1);
<< do Calculation B >>
sem_post(&semaphore2);
sem_wait(&semaphore3);
} }
void *thread2(void *vargp)
{ while(1)
{ sem_wait(&semaphore1);
<< do Calculation C >>
sem_post(&semaphore3);
sem_wait(&semaphore2);
} }
```

```
sem_t semaphore1, semaphore2, semaphore3;
int main()
{ pthread_t tid;
sem_init(&semaphore1, 0, 0); // not signaled
sem_init(&semaphore2, 0, 0); // not signaled
sem_init(&semaphore3, 0, 0); // not signaled
pthread_create(&tid, NULL, thread1, NULL);
pthread_create(&tid, NULL, thread2, NULL);
while(1){ Sleep(1000); }
}
```

A certain bar is a well-known hangout for detectives. If a detective comes to the bar and there are no clients at the bar, the detective talks to the bartender. If one or more clients are present, the detective approaches the client who arrived earliest, and they leave the bar. If a client arrives and there are no detectives at the bar, the client orders a drink and waits. If there are one or more detectives, the client and the detective who arrived earliest leave the bar. What synchronization is necessary to ensure a correct system? **(7 marks)**

How /proc is different from others? **(15 marks)**

1.
2.

What is the sequence of start, stop, next, show in any sequence file execution?

What is the difference between single_release and seq_release?

What is the contents of /sys/module directory?

Inode stores?

What is the purpose of

module_exit(ct_exit) _____

MODULE_AUTHOR() _____

MODULE_LICENSE() _____

KERN_ALERT _____

KERN_ERR _____

What is the difference between SIGINT and SIGSTOP?

What is the difference between SIGKILL and SIGTERM?

Write a code snippet which sets default behavior of ctrl+\, ignores ctrl+Z and assign func to ctrl+C.

What is the command of communication between two processes using signals?