1. Consider four processes with the following starting and ending times:

Process	Start time	End time
A	5	7
B	2	4
C	3	6
D	1	8

For each pair of processes, indicate whether they run concurrently (y) or not (n):

Sol:

Process pair	Concurrent?
AB	n
AC	y
AD	y
BC	y
BD	y
CD	y

2. Specify which kind of exception will occur in the given scenario, and point out whether it's asynchronous or synchronous.

Sol:

a) Faults — synchronous
b) Interrupts — asynchronous
c) Traps (System calls) — synchronous
d) Aborts — synchronous

3. Write the assembly code of the code segment below.

```
int main() {
        kill(97859, 9);
        exit(0);
}
```

Sol:

```
main:
    movl $37, %eax
    movl $97859, %ebx
    movl $9, %ecx
    int $0x80
```

```
movl $1, %eax
movl $0, %ebx
int $0x80
```

4. What kinds of states does a process have? And how does it change among them? Please describe in a particular way.

Sol:
States: running, stopped and terminated.
A running process becomes stopped by receiving a signal such as SIGSTOP, SIGTSTP, SIGTTIN, or SIGTTOU.
A stopped process becomes running by receiving a SIGCONT signal.
A process becomes terminated:

1. Receiving a signal whose default action is to terminate the process.
2. Returning from the main routine.
3. Calling the exit function.