

CS 201 OPERATING SYSTEMS (FALL 2005)

ASSIGNMENT 1 (DUE OCT 6. before class)

1. Do the following exercises from the text book: 1.7, 2.4, 2.5, 2.10, 3.1, 4.6.
2. Consider a floppy disk with 5 millisecond seek time, 1 millisecond rotational latency time, and 6 megabytes/second data transfer rate. How much time does it take to completely read a given track which stores 60 kilobytes of data starting at a given sector?
3. Identify and briefly describe the system calls performed during the execution of the following program segment in C.

```
FILE * fpa ; /* fpa is a file pointer */
char * sf = "sample.txt";
if ( ( fpa = fopen(sf, "r") ) == NULL )
{
    printf("Cannot open file %s \n", sf);
    exit(1);
};
fclose(fpa);
exit(0);
```

4. Consider a batch system which runs at most one job at a time. Once it starts executing a job it runs the job through completion. Suppose that there are n jobs with execution times $1, 2, \dots, n$ all of which are ready to run at time zero. Consider that the system selects as the next job to run one which demands the largest computation time among the remaining jobs. Is this a good strategy to minimize the average overall response time for this case? Why? What would be an optimal strategy (no formal proof is necessary, but briefly explain why)? Compare the result obtained by the above strategy with the optimum achievable (no formal proof for the optimality is necessary, but include an expression for the optimum result)? (Note that since all jobs are ready at time zero the response time for each job is the same as its completion time, and we would like to minimize the total completion times divided by the number of jobs, n in this case).