

# Heimadæmi 4

T-444-USTY, GRUNNATRIÐI STÝRIKERFA

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March 24, 2017

## Chapter 9

**Review Question 9.2.** What is the main function of a dispatcher? Give some examples of events when it is invoked.

**Solution:**

It is the module that gives control of the CPU to the process selected by the short-time scheduler, which involves switching context, and to user mode.

**Problem 9.1.** Given the following jobs that are to be processed on a single processor:

Process	Burst Time in ms	Arrival Time in ms
P1	4	0
P2	12	2
P3	8	6
P4	6	16
P5	10	20

- a. Show the schedule using the scheduling algorithms shortest process next, a non-preemptive algorithm, and shortest remaining time, a preemptive algorithm. Use a GANTT chart to show the schedules in a manner similar to the FCFS schedule shown below: (1 unit = 2 ms)

P1	P1	P2	P2	P2	P2	P2	P2	P3	P3	P3	P3	P4	P4	P4	P5	P5	P5	P5	P5
0	4							16				24			30				40

P1	P1	P4	P4	P4	P3	P3	P3	P3	P5	P5	P5	P5	P5	P2	P2	P2	P2	P2	P2
0	4				10				18					28					40

P1	P1	P2	P3	P3	P3	P3	P2	P3	P5	P5	P5	P5	P5	P2	P2	P2	P2	P2	P2
0	4	6					14	16					28						40

- b. Compute the turnaround time and relative delay for each algorithm

**Solution:**

SPN:  $0 + 26 + 4 - 6 + 2 = 22/4 = 5.5$

**Problem 9.2.** What factors determine the time quantum in round robin scheduling? Consider the system:

Process	Arrival Time in ms	Processing Time in ms
P1	0	12
P2	2	6
P3	8	18
P4	10	4

Context switch takes a time of 1 unit. Compute the average turnaround time of the processes for the time quanta  $q = 2$ ,  $q = 4$  and  $q = 8$  respectively.

**Solution:**

Solution for p9.2. goes here

## Chapter 10

**Review Question 10.1.** List and briefly define five different categories of synchronization granularity.

**Solution:**

Solution for r10.1. goes here

**Review Question 10.2.** What grain size of parallelism is appropriate for a multi-programmed uniprocessor?

**Solution:**

Solution for r10.2. goes here

**Review Question 10.3.** For which kinds of applications is gang scheduling of threads most useful?

**Solution:**

Solution for r10.3. goes here

## Chapter 11

**Review Question 11.4.** Why would you expect improved performance using a double buffer rather than a single buffer for I/O?

**Solution:**

Solution for r11.4. goes here

**Problem 11.3.** Consider a disk drive with 4000 cylinders, numbered from 0 to 3999. The request queue has the following composition:

1045    750    932    878    1365    1787    1245    664    1678    1897

If the current position is 1167 and the previous request was served at 1250, compute the total distance (in cylinders) that the disk arm would move for each of the following algorithms:

a: FIFO

- b: SSTF
- c: SCAN
- d: C-SCAN

**Solution:**

Solution for p11.3. goes here

## Chapter 12

**Problem 12.1.** A file contains 20000 records, each of a fixed size of 140 bytes. The file is to be stored in a disk drive having blocks of 3096 bytes with 512 bytes of inter-block gaps. If unspanned blocking is used, compute the following:

- a. Blocking factor (i.e., the average number of blocks per record).
- b. Number of blocks needed to store the 30000 records.
- c. Total size of the file.

**Solution:**

Solution for p12.1. goes here

**Problem 12.4.** For the B-tree in Figure 12.4c, show the result of inserting the key 97.

**Solution:**

Solution for p12.4. goes here

**Problem 12.7.** A sequential file is stored in a disk occupying 100 contiguous disk blocks. The disk has an average rotational delay of 2.5 ms. The time taken to seek the head of the drive to the required cylinder is 25 ms and the time taken to read a block is 0.25 ms. Find the minimum, maximum, and average time to search for a record using a linear search process.

**Solution:**

Solution for p12.7. goes here