Università degli studi “Roma Tre”

A.Y: 2021/2022
Teaching: Sistemi Operativi
Course: Ingegneria Informatica
Exam session: 21/02/2022 – Data:28/02/2022
Lecturer: Romolo Marotta
Maximum score: 31 punti

STUDENT ID_____Last Name_____First Name_____

It is recommended that you write your surname and name on this sheet and use it as a folder to contain the answer sheets. If you consider a question ambiguous, write down your interpretation and respond accordingly.

Question 1 (6 points)
Describe the Round Robin policy for CPU-scheduling and discuss its pros and cons.

Question 2 (6 points).
In the context of memory management, describe the concept of pagination, highlightening its goals and operation schema.

Question 3 (9 points).
Describe the elements to consider when estimating the access times to a hard disk. Also, describe the *SCAN* disk-scheduling policy and how it behaves in a scenario where requests arrive at the operating system to access the following tracks on a disk:

120, 30, 60, 45, 25,90, 70, 15, 20.

Determine the actual scheduling sequence of operations towards the disk by considering that the head is initially placed on track 50 of the disk with a direction oriented towards increasing track numbers.

Question 4 (10 points)
Write a C code function with the following interface:
`int filter_and_tunnel(int descriptors[], int count, char c, int fd_log)).`
This function leads the application to manage, for each file-descriptor of the array *descriptors*, the forwarding and filtering of the incoming data stream to the file-descriptor *fd_log*.

In particular:

- the *count* parameter indicates how many elements the array *descriptors* consists of
- the streams produce sequences of 49 characters ending with '\ n', called lines
- the function redirects only the lines starting with the character *c* to *fd_log*
- the forwarding must be implemented concurrently for the different channels
- forwarding ends as soon as an empty line is received
- when all the streams are finished, the function prints the total number of lines redirected to *fd_log*

The publication of the result via Web will take place anonymously using the serial number. To have your exam grade published on the course website, you must sign the following authorization.

The undersigned, pursuant to law 675 of 31/12/96, authorizes the lecturer to publish the results of the exam on the bulletin board and / or on the Web. In faith

Legible signature: _____