

# Exercise 5

Distributed Software Systems — Prof. Paolo Ciancarini  
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# Directory monitor daemon

We want to create a daemon, written in Python, that can monitor a directory and log to a file a message with a timestamp anytime a file is added to that path.

The python script will be turned into a daemon within the script itself, by means of the **python-daemon** library.

The daemon will then be tested by periodically adding new files to the directory for two days, and then observing the produced log.

# Directory monitoring algorithm

- When the program is launched for the first time, an empty set is initialized
- Every ten seconds, the monitored directory is scanned; if a file name is not already present in the set, it is inserted into it and this information is added to the log
- Since the monitoring happens every ten seconds, there may be a mismatch in the timestamp written in the log, if we use as a timestamp the result of calling **`datetime.now`**
  - example: a new file is added at 09:50:55, but the scanning begins at 09:51:02, so the it will be logged that it was added at 09:51:02, instead of 09:50:55
- Solution: calling the library function **`os.path.getctime`**, that yields the creation date from file's metadata

# Testing the system

- The script **dirwatcher.py** is called passing the directory “**./test/**” as a command-line parameter
  - As soon as the command is executed, the process is immediately detached from the terminal and starts running in the background as a daemon
- We add a line to the **crontab** file, in order to execute the script **populate.sh** once per hour
  - **populate.sh** simply uses the **touch** command to create a new file in the **test** directory; to ensure unique file names, it uses the current EPOCH timestamp in seconds as name
- If necessary, the **test** directory can be emptied easily by executing the provided **clear.sh** script
- The daemon will be left running in the background during two consecutive days

# Snippet of log

```
≡ dirwatcher.log
1  [02/11/2023 10:20:01] File named "1698916801.txt" added
2  [02/11/2023 11:20:01] File named "1698920401.txt" added
3  [02/11/2023 12:20:01] File named "1698924001.txt" added
4  [02/11/2023 13:20:01] File named "1698927601.txt" added
5  [02/11/2023 14:20:01] File named "1698931201.txt" added
6  [02/11/2023 15:20:01] File named "1698934801.txt" added
7  [02/11/2023 16:20:01] File named "1698938401.txt" added
8  [02/11/2023 17:20:01] File named "1698942001.txt" added
9  [02/11/2023 18:20:01] File named "1698945601.txt" added
10 [02/11/2023 19:20:01] File named "1698949201.txt" added
11 [02/11/2023 20:20:01] File named "1698952801.txt" added
12 [02/11/2023 21:20:01] File named "1698956401.txt" added
```