

ASSIGNMENT REPORT 2: MULTIPROCESS IMPLEMENTATION

CENG2034, OPERATING SYSTEMS

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Abstract

The purpose of this assignment is to understand child and parent relationships and use multiprocessing. method.I downloaded some files with the function using child process from a given Array list.

1 Introduction

This Assessment I compared many types of processes.I learned how to use it.

2 Assignments

I started this task by taking the necessary libraries.

```
import os
import requests
import sys
from multiprocessing import Pool
from multiprocessing import Process
import glob
import shutil
import urllib.request
import hashlib
```

2.1. For Print parent id

Print parent id to screen.Create child process using fork.If pid of process is greater than 0 that means it is parent process.os.wait() method is used by a process to wait for completion of a child process. If pid of process is equal to 0 that means it is child process.Print child id to screen.

```
print("The PID of the main process: ", os.getpid())
pid = os.fork() #

if (pid > 0): #
    os.wait() #

if (pid == 0): #
    print("The PID of the child process: ", os.getpid()) |
```

2.2 With the child process, downloading the files via the given Array list

Requests.get method makes a request to a url, and return the status code. If status code equal to 200 that means url is working.

Create a file named file_name. Print information and file name after that Print if url was not downloaded, and check for duplicates. The elements registered in the a list were checked with the multiprocessing technique and the duplicate

```
array = [
    "http://wiki.netsec.lab.mu.edu.tr/images/thumb/f/f7/MSKU-BlockchainResearchGroup.jpeg/300px-MSKU-BlockchainResearchGroup.jpeg",
    "https://upload.wikimedia.org/wikipedia/tr/9/98/Mu%C4%9Fla_S%C4%B1tk%C4%B1_Ko%C3%A7man_%C3%9Cniversitesi_Logo.png",
    "https://upload.wikimedia.org/wikipedia/commons/thumb/c/c3/Hawaii%27i.jpg/1024px-Hawaii%27i.jpg",
    "http://wiki.netsec.lab.mu.edu.tr/images/thumb/f/f7/MSKU-BlockchainResearchGroup.jpeg/300px-MSKU-BlockchainResearchGroup.jpeg",
    "https://upload.wikimedia.org/wikipedia/commons/thumb/c/c3/Hawaii%27i.jpg/1024px-Hawaii%27i.jpg"]

file_name = ["1.url", "2.url", "3.url", "4.url", "5.url"]

def download_file(url, file_name):

    r = requests.get(url, stream=True)
    if r.status_code == 200:
        r.raw.decode_content = True

        with open(file_name, 'wb') as f:
            shutil.copyfileobj(r.raw,
                               f)

        print("File Downloaded and checked", file_name)
    else:
        print("File can not Downloaded Error !")
        p = multiprocessing.Pool(processes=6)
        file_hashes_list = p.map(hashFile, files)

        for file_hash in file_hashes_list:
            pushDictAndCheckDuplicates(file_hash)
```

2.3 Avoiding the orphan process situation

This time the problem was avoiding the orphan process situation. I added wait() for this, after the child but before the parent because I wanted my parent process to wait child to complete. We created child processes and with "os.wait()" methods, avoid from orphan processes.

```
def avoid_orphan_process():
    child_pid = os.fork()
    if (child_pid > 0):
        print("avoided orphan process")
        time.sleep(50)

    else:
        exit(0)

avoid_orphan_process()

for file_hash in file_hashes_list:
    pushDictAndCheckDuplicates(file_hash)
```

3 Results

I got this output showing parent and child pids. It shows a list of downloaded files, the pids of

```
The PID of the main process: 6042
The PID of the child process: 6043
File Downloaded and checked 1.url
File Downloaded and checked 2.url
File Downloaded and checked 3.url
File Downloaded and checked 4.url
File Downloaded and checked 5.url
```

the processes in the functions, duplicate files list and taken time.

4 Conclusion

I learned a lot with this task. One of the first things I learned; in multiprocessing, multiple processes or jobs can be run and managed by the CPU or a single program. This Assignment was very instructive and made me understand how processes work.

5 My github

github.com/zekisaglam/