Final Exam — Timothy Ford — Operating Systems

Description:

This is a program that is supposed to simulate Bankers algorithm for deadlock avoidance and detection. It essentially a replicates a scneario in which system resources might be in jeopardy and then runs bankers algorithm on it and determines if the initial state has a deadlock condition or if it can run. Sometimes it runs all the way and all the processes are freed, other times some processes can run but deadlock is inevitable. What it does not do is run as an extension of Dash through c++ as a system-ish call due to personal incompetencies.

Algorithms and libraries used:

I used a couple of online pages, the book, and lectures for tracking down an understanding of Bankers algorithm and the idea of deadlock. I used standard C++ and standard Python (greater than 3.6 for type hints!) for the code.

Structure/Functions:

Well, there is the Dash shell, and then I intended it to call a Python executable that was exported to path as a system call so that my Python program would run in Dash and you would't notice, but I couldn't get that to work so I guess I accidentally wrote this in python in bankers.py… I was going to wrote the sim out in Python and something cooler in Dash but here we are… The python file has a simulation that concludes as well as a generator that gives random simulations based on the parameters you wanted.

The functions and other variables are pretty well documented in the file itself.

Compile/Use:

Well it's python so as long as you have >= Python 3.6 then "python bankers.py" should do it. Then, answer whether you want to use the preset values or generate a random simulation. Then it runs the simulation, if you want to change parameters, you can hop to the init and take care of that there.

Testing/verification:

Followed the algorithm through on a couple separate runs to make sure it checked out and also ran a bunch of random ones and made sure that they looked like they made sense.

Submit:

- bankers.py - the deadlock simulation
- The usual Dash + bugs