CSCI 5531

Programming Assignment 1

In this assignment you are to write a client/server based program to represent

the system in figure: 2.11.

In this program you are to implement a single service broker, multiple service

providers, and a single service requister.

The Service Broker:

This program will be a concurrent server, one process of this server will

will accept connections from the service requester to tell the service

requester about the available services and where are they located.

Each service will be represented by an integer that identifies the service,

a port number, and an IP address. For simplicity's sake we will keep the IP

address as the loopback IP addres 127.0.0.1 which means that all processes

will run on the local machine, but the port number is going to change. So,

simply you need to provide two integers to the service requester.

The other process will take care of generating the services and their port

numbers (since the IP address is already known). There's no communication here

with a service provider needed, you are just going to simulate this by having

this service broker process randomly and every 15 seconds generate a random

number between 1 and 100 that represents the service and assign it a unique

port number. In addition to generating one number every 15 seconds, every

30 seconds you will remove the earliest number that you generated from the

list of available services. You need to keep in mind that you may randomly

generate duplicates, so you don't want to keep duplicates in the list of

services availabe.

The best way to coordinate between these two concurrent processes is to use

a semaphore. This is similar to the readers-writer problem you've studied in

CPSM.

The Service Requester:

This one is an interactive client program, that is a client of the broker,

and all it does, based on user's input, checks to see if a particular service

is available at the broker and where is it available. If the broker responds

negatively that the broker doesn't have that service, then the requester

goes back and checks for another service until it finds one (in this case

the requester received a message from the broker containing a service number

and a port number).

Once the service requester receives a service number and a port number, then

you make the request from the service provider server.

The requester is a sequential client, it contacts the broker first, and upon

positive response from the broker, it contacts the service provider.

The service provider:

Once the requester got a positive response from the service broker, then you

need to manually run the service provider program that will run on the same

machine and open the port provided and waits for a request from the service

requester. This request is a very simple request, in the form of a question:

can you provide this service, and the answer should be yes from the service

provider if everything is OK, otherwise no, I can't.

Best of Luck and let me know if you have any questions.