Comp 413: Test 4 Practice Exam - Dr. Yacobellis• Fall 2016

Please answer briefly and concisely, providing justification where appropriate. Concepts are more important than syntax, so please use pseudo-code when you are unsure about syntactic details and provide additional explanations where appropriate. **If you use pseudocode, please note that!**

Problem 1 (Code Smells)

Consider the following code:

```
void display(string name, string address, string phone, string cell, string company) {
  System.out.println(name + ", " + address + ", " + phone + ", " + cell + ", " + company);
}
```

a) 0.5 Which *code smell* is present in this code? *(Choose exactly one.)*

( ) duplicate code ( ) long parameter list

( ) long method ( ) none

b) 0.5 Which refactoring would you choose to eliminate the smell *(Choose exactly one.)*

( ) extract method ( ) introduce parameter object

( ) replace method with method object ( ) none required

c) 1 What will the code look like (conceptually) after the refactoring (if required):

Problem 2 (Concurrency & Multi-Threaded Execution)

a) *(TRUE or FALSE)* Using a shared mutable variable is a safe practice for concurrent processing.

b) What kind of mechanism(s) can you use to protect a critical section of code during multi-threaded execution? *(Choose all that apply.)*

( ) use an explicit locking mechanism to enforce mutually exclusive access to the critical section

( ) use an imperative programming language

( ) encapsulate the critical section inside a thread-safe data structure

( ) use message passing instead of shared memory

c) *(TRUE or FALSE)* In the prime checker Android app example, an `AsyncTask` is required for running the CPU-intensive code locally but not remotely.

Problem 3 (Cloud Computing)

a) Characterize each of the following technologies as *SaaS, PaaS, IaaS, DaaS,* or *other*:

AWS Elastic Beanstalk:

Google Docs:

Jolicloud:

Windows Azure:

c) *(TRUE or FALSE)* A given task takes 0.7 seconds when run locally and 0.3 seconds when run in the cloud. The round-trip latency (time to get a response, not including processing) for the cloud provider is 0.5 seconds. By running this task in the cloud, we will get our results faster.

Answers:

Problem 1 (Code Smells)

Consider the following code:

```
void display(string name, string address, string phone, string cell, string company) {
  System.out.println(name + ", " + address + ", " + phone + ", " + cell + ", " + company);
}
```

a) 0.5 Which *code smell* is present in this code? *(Choose exactly one.)*

( ) duplicate code (X) **long parameter list**

( ) long method ( ) none

b) 0.5 Which refactoring would you choose to eliminate the smell *(Choose exactly one.)*

( ) extract method (X) **introduce parameter object**

( ) replace method with method object ( ) none required

c) 1 What will the code look like (conceptually) after the refactoring (if required):

```
// create a class called Person and instantiate a Person object p containing this information
// then call display with that kind of object
void display(Person p) {
  System.out.println(p.getName() + ", " + p.getAddress() /* etc */);
}
```

Problem 2 (Concurrency & Multi-Threaded Execution)

a) *(TRUE or **FALSE**)* Using a shared mutable variable is a safe practice for concurrent processing.

b) What kind of mechanism(s) can you use to protect a critical section of code during multi-threaded execution? *(Choose all that apply.)*

(X) **use an explicit locking mechanism to enforce mutually exclusive access to the critical section**

( ) use an imperative programming language

(X) **encapsulate the critical section inside a thread-safe data structure**

(X) **use message passing instead of shared memory**

c) *(**TRUE** or FALSE)* In the prime checker Android app example, an `AsyncTask` is required for running the CPU-intensive code locally but not remotely.
Remote execution of the CPU-intensive code is already asynchronous.

Problem 3 (Cloud Computing)

a) Characterize each of the following technologies as *SaaS, PaaS, IaaS, DaaS,* or *other*:

AWS Elastic Beanstalk: **PaaS**

Google Docs: **SaaS**

Jolicloud: **DaaS**

Windows Azure: **IaaS**

c) *(TRUE or **FALSE**)* A given task takes 0.7 seconds when run locally and 0.3 seconds when run in the cloud. The round-trip latency (time to get a response, not including processing) for the cloud provider is 0.5 seconds. By running this task in the cloud, we will get our results faster.
It actually takes longer (0.8 seconds vs. 0.7 seconds).