Student Name: _____ Student ID # _____

UOSA Statement of Academic Integrity

On my honor I affirm that I have neither given nor received inappropriate aid in the completion of this exercise.

Signature: _____ Date: _____

Notes Regarding this Examination

Open Book(s) You may consult any printed textbooks in your immediate possession during the course of this examination.

Open Notes You may consult any printed notes in your immediate possession during the course of this examination.

No Electronic Devices Permitted You may not use any electronic devices during the course of this examination, including but not limited to calculators, computers, and cellular phones. All electronic devices in the student's possession must be turned off and placed out of sight (for example, in the student's own pocket or backpack) for the duration of the examination.

Violations Copying another's work, or possession of electronic computing or communication devices in the testing area, is cheating and grounds for penalties in accordance with school policies.

Question 1: Exceptions and Assertions (10 points)

In Java, **catch** blocks associated with the same **try** block must be ordered in a particular way.

A. What is the particular way in which **catch** blocks must be ordered?

B. *Explain* one good reason for requiring **catch** blocks to be ordered in this way.

Question 2: Exceptions and Assertions Redux (10 points)

What is the purpose of the **finally** keyword? Why not have the code that is inside **finally** blocks in existing Java programs simply come after the last **catch** block?

For example, why not replace code of this form

```
try {
    // code to try here
}
catch (/* exception to catch here */) {
    // code to catch exception here
}
finally {
    // code in question here
}
```

with code of this form

```
try {
    // code to try here
}
catch (/* exception to catch here */) {
    // code to catch exception here
}
// code in question here
```

each place it is found? *Explain* your answer.

Question 3: Recursion (20 points)

Dan wants to sum up arrays of integers. He loves recursion so he decides to write a recursive method to sum them up.

A. *Explain* whether it is possible to write such a method. If it is, *explain* how to do it. (You may do this by writing Java code or pseudo code, or simply explaining in English how the method would work.) If not, *explain* why not.

B. Assuming that it is possible to write summation methods recursively, say whether you think it would be a good idea or a bad idea for Java programmers in general to write summation methods this way. *Explain* one good reason supporting your opinion.

Question 4: Multithreading (20 points)

There are two basic approaches to creating a multithreaded application in Java. One is to define a new class to implement **Runnable**, implement a **run** method for your new class, create objects of your new class, and then create new threads to run your objects. The second is to define a new class that extends **Thread**, implement a **run** method for your new class, then create objects of your new class.

A. Which of these two approaches to creating multithreaded applications is generally said to be preferred?

B. *Explain* one good reason for preferring the approach you listed in Part A.

Question 5: MVC (20 points)

A. In the Model, View, Controller (MVC) paradigm discussed in class, why does a GUI view notify its controllers of user gestures aimed at the view? *Explain* your answer.

B. In the MVC paradigm discussed in class, *how* does the view notify its controller of user gestures aimed at the view? *Explain* your answer.

C. In the MVC paradigm discussed in class, why might a controller tell a model to update the model's internal state as a result of user gestures aimed at a view? *Explain* your answer.

D. In the MVC paradigm discussed in class, *how* does a controller tell a model to update the model's internal state as a result of user gestures aimed at a view? *Explain* your answer.

Question 6: Ethics (20 points)

José wants to write scripts for a TV series involving the emergency room in a hospital in a large American city. Unfortunately for José, he doesn't know much about emergency medicine. However, José is resourceful so he applies for and gets a system administrator job with a local hospital. With this job he is able to access records of the hospital's emergency room, including detailed notes from doctors, nurses, and others regarding particular patients and events. Using this as a resource, he writes up some TV scripts in which he changes the names of the patients, doctors, nurses, and others involved. He sells these to the producers of the TV series and some of them even make it into production and onto the air. Not only is he happy with the extra money he has made from selling the scripts, he is thrilled to have his name appear as the author of the episodes.

A. Find at least one ethical principle from a professional code of ethics that is relevant to this scenario. List the principle, give its source, and *explain* why you think it is relevant.

B. Say whether you think José abided by the principle you listed and *explain* how you came to that conclusion.

C. Give one likely motivation for José's action and *explain* how you concluded that was a likely motivation.

D. *Explain* a strategy that José could use to improve his ethical decision making.