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: Graphics (20 points)

A. *Explain* why you should generally draw on a `JComponent` within a `JFrame` rather than on the `JFrame` itself.

B. *Explain* why your calls to `Graphics` methods (such as `drawLine()`, `drawRect()`, and `fillRect()` should generally be placed within the `JComponent`'s `paintComponent()` method, rather than elsewhere in the code.

C. *Explain* why should you generally call `setVisible(true)` after methods such as `setSize()` and `setLocationRelativeTo()`, rather than before them.

Question 2: Graphical User Interfaces (20 points)

A. List and *explain* one advantage of the `BorderLayout` manager over the `FlowLayout` manager from the perspective of developing a good user interface.

B. *Explain* how making a window "modal" can simplify your task of developing a good user interface.

Question 3: Event-Driven Programming in the Model, View, Controller paradigm (40 points)

Consider a prototypical model-view-controller arrangement such as we have been discussing in class and represented in the diagram below (from `http://java.sun.com/blueprints/ patterns/MVC-detailed.html`).
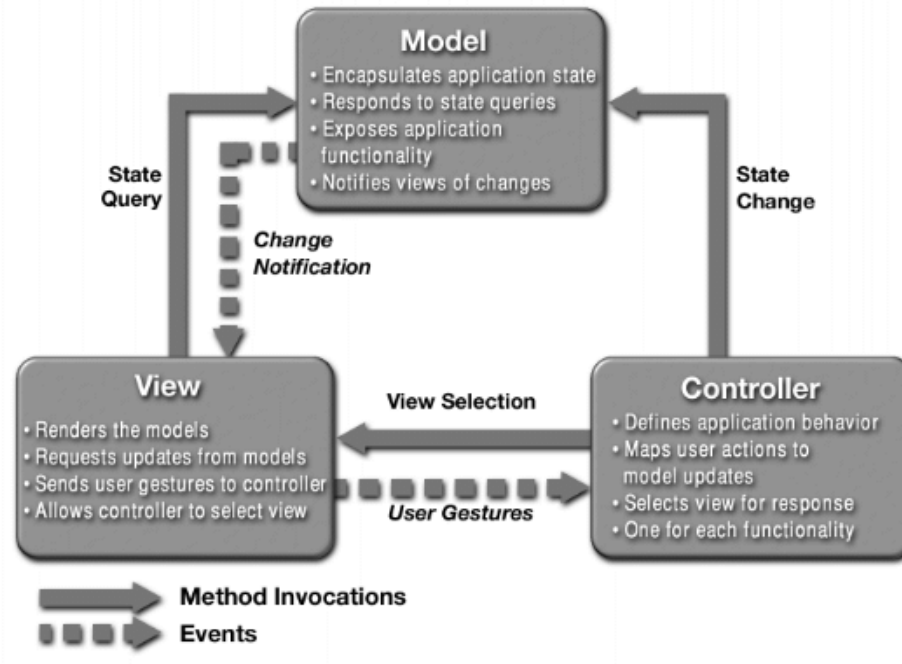
Assuming one model, one view, and one controller, how many lists of listeners will there be?

For each listener list answer the following questions:

1. Which object stores the list?

2. Which object is doing the listening?

3. Which object is being listened to?

4. What types of events are being listened for?

For each listener list *explain* what purpose is served by this setup. That is: Why does the object from point 1 store the list? Why does the object from point 2 listen for the events from point 4? Why does the object from point 3 need to be listened to? What information is contained in the events from point 4 and why?

Space to answer Question 3.

Question 4: Text and Binary I/O (20 points)

Imagine that you change your `Dictionary` class from your projects to have a method called "`rankWords()`" that ranks the words based on score such that highest scoring word in the dictionary is ranked first (given a rank of 1), the next highest scoring word is ranked second (rank 2) and so forth. (If there is a tie in score, two or more words will have the same rank and some ranks will be skipped. For example, if two words are tied for the highest score, they will both be ranked first and the next longest word will be ranked third.)

Imagine further that you change your `Word` class to contain an additional field called "`rank`" that holds its rank after `rankWords()` is called on the dictionary.

A. To handle these changes to your dictionary class, will you need to change your import and/or export (text I/O) methods for your dictionary? *Explain* your answer.

B. To handle these changes to your dictionary class, will you need to change your save and/or load (object I/O) methods for your dictionary? *Explain* your answer.