H09: Due Wednesday, 01.20 in Lecture

More on GUIs: Widgets, Actions, Events, ActionListeners, Inner Classes (HFJ Ch12, entire chapter.)
Assigned: Mon 01.11 Total Points: 50

MAY ONLY BE TURNED IN IN THE LECTURE/LAB LISTED ABOVE AS THE DUE DATE, OR IF APPLICABLE, SUBMITTED ON GRADESCOPE. There is NO MAKEUP for missed assignments; in place of that, we drop the five lowest scores (if you have zeros, those are the five lowest scores.)

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Reading Assignment:
Re-Read Chapter 12, this time reading it in its entirety.
- You read pages 353-355 and 363-368 for H10, but you might have just skimmed pages 356-362, and skipped
- This time: read the entire chapter, especially pages 356-362, and 369-398.
- The important stuff this time is about **Widgets**, **Actions**, **'Events'**, **ActionListeners**, **Inner Classes**

1. (5 pts) Fill in the homework header properly — this helps us keep the grading pipeline flowing so that you get credit for your work and get feedback more quickly.
   - writing **either 4, 5, or 6** to indicate your discussion section (lab) meeting time
   - entering BOTH your name AND your umail address EVERY time.

   **Paper submissions**: One sheet of 8.5x11 paper double sided, or two DISCONNECTED SHEETS with your name on EACH. Please: **NO STAPLES, NO PAPERCLIPS, NO TAPE, NO ATTACHMENT OF ANY KIND**. These damage the document scanner.

   **Scanned submission**: When submitting by PDF upload: scan your pages legibly and **SCAN IN THE CORRECT ORDER**. Page 1 first, then Page 2, in the correct orientation. Failure to scan properly may result in zero credit, meaning you "use up" one of your five "drop the lowest grade" slots.

2. (6 pts) What are five examples of Java classes that are considered "widgets"?

3. What is the "job" of each of these objects in terms of handling an event in Java GUI programming?
   a. (5 pts) listener object (the one that implements ActionListener)
   b. (5 pts) event source object
   c. (5 pts) ActionEvent object
4. The author explains that each specific instance of an inner class instance has a "special bond" with a specific instance of an outer class instance.

   a. (6 pts) Explain what this author means by this "special bond". (What I'm looking for is: what does the special bond allow the the inner class instance to do that other objects lacking this bond cannot do?)

   b. (6 pts) Briefly explain: how does this "Special Bond" property of inner class objects make them particularly useful for implementing an ActionListener for a Widget?

5. (6 pts) Briefly explain one way to do animation (as explained in Chapter 12). Include a brief explanation of what you have to do to avoid "smearing".

6. (6 pts) In the animation code there is a little line of code that is a "preview" of something that, according to the comment beside it, you "aren't supposed to know yet"--a foreshadowing of Chapter 15. But it is an essential piece of making the animation work so that it doesn't happen all in the blink of an eye, and you miss the whole thing. What is that line of code (write it down), and what does it do (explain briefly)?