CS260 Intro to Java & Android

10. Android Adv UI (Part III)

Winter 2015
Creating TicTacToe for Android

- Thus far we have
  1. Created a TicTacToe board
  2. Captured onTouch events
  3. Hooked up our TicTacToe Java code to the Android code
Creating TicTacToe for Android

● Final steps
  1. Highlighting a rectangle
  2. Writing text centered in a rectangle
  3. Implement the game play
Let’s work backward ... at some point we need to draw the selected rectangle in the `onDraw`

Here’s a hard coded example

```java
private Rect mSelectedRectangle = new Rect();
private Paint mSelectedRectanglePaint = new Paint();
mSelectedRectangle.set(10, 10, 50, 50);
mSelectedRectanglePaint.setColor(Color.BLUE);
canvas.drawRect(mSelectedRectangle, mSelectedRectanglePaint);
```
The selected rectangle area on the display needs to be set

```java
private void setSelectedRectangle (int xCoordinate,
int yCoordinate, Rect rectangle)
{
    rectangle.set ((int) (xCoordinate * mRectangleWidth),
(int) (yCoordinate * mRectangleHeight),
(int) (xCoordinate * mRectangleWidth +
mRectangleWidth - 1),
(int) (yCoordinate * mRectangleHeight +
mRectangleHeight - 1));
}
```
Selecting Rectangle Using Board Coordinates

- Select the \((x,y)\) coordinates of the rectangle on the screen

```java
private void selectRectangle (int xCoord, int yCoord)
{
    invalidate (mSelectedRectangle); // invalidate old rectangle selection
    mXCoordSelectedRect = Math.min (Math.max(xCoord, 0),
                                      (int) mNUMBER_OF_RECTANGLES - 1);
    mYCoordSelectedRect = Math.min (Math.max(yCoord, 0),
                                      (int) mNUMBER_OF_RECTANGLES - 1);
    setSelectedRectangle (mXCoordSelectedRect, mYCoordSelectedRect, mSelectedRectangle);
    invalidate (mSelectedRectangle); // invalidate new rectangle selection
}
```
Drawing a Selected Rectangle

- In the onTouchEvent, make a call to select

- Add additional logic so that the screen initially has no selected rectangles. As soon as the user hits a rectangle, highlight the selected rectangle

- See the following slide
Drawing a Selected Rectangle
Finally, we need to paint some text on the screen. Code is based on *Hello, Android* by Ed burnette

```java
private Paint mForeground = new Paint(Paint.ANTI_ALIAS_FLAG);
...

mForeground.setStyle(Style.FILL);
mForeground.setTextSize(mRectangleHeight * 0.75f);
mForeground.setTextSizeScaleX(mRectangleWidth / mRectangleHeight);
mForeground.setTextAlign(Paint.Align.CENTER);
FontMetrics fontMetrics = mForeground.getFontMetrics();
float xFontCoord = mRectangleWidth / 2;
float yFontCoord = mRectangleHeight / 2
    - (fontMetrics.ascent + fontMetrics.descent) / 2;
```
Painting Text

- Drawing text into a rectangle is:
  ```java
canvas.drawText (Integer.toString (i),
  x * mRectangleWidth + xFontCoord,
  y * mRectangleHeight + yFontCoord,
mForeground);
```

- You are to draw the numbers 1 through 9 in the TicTacToe board tiles going upper-left to lower-right