## Exercise 7.1: Fetch/Add data in background

Change API calls to occur in the background!

Take the following steps:

* Remove the lines that start with StrictMode... from the onCreate()-method of your *Activities*.
* Create classes for each API call that implement the interface Runnable.
* Move the methods that make API calls from the RecipeDatabase to the corresponding Runnable class. If needed create a constructor that can take references to required objects (f.e. activity).
* Implement the run()-method of your *Runnable*.
* When the users selects the menu entry to refresh the recipe list, start this process in the background by instantiating FetchRecipeListRunnable and starting a new *Thread*.
* Ask yourself: What would happen, when the user starts a refresh while one is still in progress?

When in doubt, ask the advisor!

Do you notice that the UI stays responsive during the update now?

**Note:** You can simulate a “bad” network connection in the emulator by opening the “Extended controls” (button “…” in the toolbar) and then in the area “Cellular” selecting a worse network type or signal strength.

## Exercise 7.2: A toast to recipe list update

Create a toast that informs the user when the update is finished.

The toast is triggered from FetchRecipeListRunnable.run() once the currency data has been refreshed.

However, a toast can only be started from the UI thread. This means you will need to create a new Runnable that is passed to the UI thread for execution:

**activity**.runOnUiThread(**new** Runnable() {  
 @Override  
 **public void** run() {  
 // Create and show toast!

}  
});

## Exercise 7.3: A Notification for new recipes

Show an additional *Notification* once the refresh has finished!

## Exercise 7.4: Edit a recipe via the Rest API (optional)

Add a new menu entry to the details page app bar that allows you to edit the currently shown recipe. The fetch details endpoint returns an isCreator variable, which determines if the user has the permission to update or delete the recipe. Make the new menu entry visible only if isCreator is true. To edit the recipe, you can edit the create recipe activity and the corresponding runnable to load the recipe data if provided and then execute a PUT request using the recipe id to update the data. Alternatively, you can create a new runnable and activity for this functionality.

## Exercise 7.5: Delete a recipe via the Rest API (optional)

Add a new menu entry to the details page app bar that allows you to delete the currently shown recipe. Make the new menu entry visible only if isCreator is true. You will need to create a new runnable for the tasks. Make sure you destroy the details activity after the recipe’ deletion from the server. Optionally, you can show a toast message as confirmation to the user that operation was successful.

## Exercise 7.6: Find out how to deploy your app

Create a signed APK as shown during the lecture.