

PennyAndroid/activity_main.xml (Page 1 of 1)

```

1: <?xml version="1.0" encoding="utf-8"?>
2: <androidx.constraintlayout.widget.ConstraintLayout
3:     xmlns:android="http://schemas.android.com/apk/res/android"
4:     xmlns:app="http://schemas.android.com/apk/res-auto"
5:     xmlns:tools="http://schemas.android.com/tools"
6:     android:layout_width="match_parent"
7:     android:layout_height="wrap_content"
8:     tools:context=".MainActivity">
9:
10:    <LinearLayout
11:        android:layout_width="match_parent"
12:        android:layout_height="match_parent"
13:        android:orientation="vertical"
14:        tools:layout_editor_absoluteX="16dp"
15:        tools:layout_editor_absoluteY="2dp">
16:
17:        <EditText
18:            android:id="@+id/editText"
19:            android:layout_width="match_parent"
20:            android:layout_height="wrap_content"
21:            android:hint="Enter an author"
22:            android:inputType="text" />
23:
24:        <TextView
25:            android:id="@+id/textView"
26:            android:layout_width="match_parent"
27:            android:layout_height="wrap_content" />
28:    </LinearLayout>
29:
30: </androidx.constraintlayout.widget.ConstraintLayout>

```

PennyAndroid/MainActivity.java (Page 1 of 3)

```

1: //-----
2: // MainActivity.java
3: // Author: Bob Dondero
4: //-----
5:
6: package edu.Princeton.penny;
7:
8: import android.widget.EditText;
9: import android.app.Activity;
10: import android.os.Bundle;
11: import android.text.method.ScrollingMovementMethod;
12: import android.widget.TextView;
13: import android.text.TextWatcher;
14: import android.textEditable;
15:
16: import java.io.BufferedReader;
17: import java.io.IOException;
18: import java.io.InputStreamReader;
19: import java.net.URI;
20: import java.net.URL;
21: import java.net.URLEncoder;
22: import java.nio.charset.StandardCharsets;
23: import javax.net.ssl.HttpURLConnection;
24: import java.util.Timer;
25: import java.util.TimerTask;
26:
27: import org.json.JSONObject;
28: import org.json.JSONArray;
29:
30: public class MainActivity extends Activity {
31:     private EditText editText;
32:     private TextView textView;
33:     private AuthorSearchThread authorSearchThread = null;
34:     private Timer timer = null;
35:
36:     //-----
37:
38:     private class AuthorSearchThread extends Thread {
39:         private String author;
40:         private boolean shouldStop = false;
41:
42:         public AuthorSearchThread(String author) {
43:             this.author = author;
44:         }
45:
46:         public void setShouldStop() {
47:             shouldStop = true;
48:         }
49:
50:         public void run() {
51:             String books;
52:
53:             try {
54:                 String encodedAuthor = URLEncoder.encode(author,
55:                     StandardCharsets.UTF_8);
56:                 URL url = URI.create("https://pennyjson.onrender.com" +
57:                     "/searchresults?author=" + encodedAuthor).toURL();
58:                 HttpURLConnection con =
59:                     (HttpURLConnection) url.openConnection();
60:
61:                 con.setRequestMethod("GET");
62:                 con.setDoInput(true);
63:                 con.connect();
64:                 int responseCode = con.getResponseCode();
65:                 if (responseCode != HttpURLConnection.HTTP_OK)

```

PennyAndroid/MainActivity.java (Page 2 of 3)

```

66:         throw new IOException(
67:             "HTTP error code: " + responseCode);
68:
69:         // Read the response, a JSON document containing books,
70:         // from the server.
71:         BufferedReader in =
72:             new BufferedReader(
73:                 new InputStreamReader(con.getInputStream()));
74:         String jsonDoc = in.readLine();
75:         in.close();
76:
77:         // Use the JSON response to build a String, and assign
78:         // it to books.
79:         JSONArray jsonArray = new JSONArray(jsonDoc);
80:         StringBuilder booksBuilder = new StringBuilder();
81:         for (int i = 0; i < jsonArray.length(); i++) {
82:             JSONObject jsonObject = jsonArray.getJSONObject(i);
83:             booksBuilder.append(jsonObject.getString("isbn"));
84:             booksBuilder.append(" ");
85:             booksBuilder.append(jsonObject.getString("author"));
86:             booksBuilder.append(" ");
87:             booksBuilder.append(jsonObject.getString("title"));
88:             booksBuilder.append("\n");
89:         }
90:         books = booksBuilder.toString();
91:
92:         if (! shouldStop)
93:             runOnUiThread(() -> { textView.setText(books); });
94:
95:         catch (Exception e) {
96:             if (! shouldStop)
97:                 runOnUiThread(() -> { textView.setText(e.toString()); });
98:         }
99:     }
100: }
101:
102: //-----
103:
104: private class MyTimerTask extends TimerTask {
105:     public void run() {
106:         String author = editText.getText().toString();
107:
108:         if (authorSearchThread != null)
109:             authorSearchThread.setShouldStop();
110:
111:         AuthorSearchThread authorSearchThread =
112:             new AuthorSearchThread(author);
113:         authorSearchThread.start();
114:     }
115: }
116:
117: //-----
118:
119: private class MyTextWatcher implements TextWatcher {
120:     public void onTextChanged(CharSequence s, int start,
121:         int before, int count) {
122:     }
123:
124:     public void beforeTextChanged(CharSequence s, int start,
125:         int count, int after) {
126:     }
127:
128:     public void afterTextChanged(Editable s) {
129:         if (timer != null)
130:             timer.cancel();

```

PennyAndroid/MainActivity.java (Page 3 of 3)

```

131:         timer = new Timer();
132:         timer.schedule(new MyTimerTask(), 500);
133:     }
134: }
135:
136: //-----
137:
138: protected void onCreate(Bundle savedInstanceState) {
139:     super.onCreate(savedInstanceState);
140:
141:     // Set the content view of the window to activity_main,
142:     // as defined in activity_main.xml.
143:     setContentView(R.layout.activity_main);
144:
145:     // Find the EditText object.
146:     editText = findViewById(R.id.editText);
147:
148:     // Instantiate a TextWatcher object, and install it as a
149:     // "text changed" listener on the EditText object. Subsequently,
150:     // immediately after the user changes the text within the
151:     // EditText object, the afterTextChanged() method will be
152:     // called.
153:     editText.addTextChangedListener(new MyTextWatcher());
154:
155:     // Find the TextView object.
156:     textView = findViewById(R.id.textView);
157:
158:     // Allow the TextView object to scroll, just in case there are
159:     // many books.
160:     textView.setMovementMethod(new ScrollingMovementMethod());
161: }
162: }

```

PennyAndroid/AndroidManifest.xml (Page 1 of 1)

```
1: <?xml version="1.0" encoding="utf-8"?>
2: <manifest xmlns:android="http://schemas.android.com/apk/res/android"
3:     package="edu.Princeton.penny">
4:
5:     <uses-permission android:name="android.permission.INTERNET"/>
6:     <uses-permission
7:         android:name="android.permission.ACCESS_NETWORK_STATE"/>
8:
9:     <application
10:         android:allowBackup="true"
11:         android:icon="@mipmap/ic_launcher"
12:         android:label="@string/app_name"
13:         android:roundIcon="@mipmap/ic_launcher_round"
14:         android:supportsRtl="true"
15:         android:theme="@style/Theme.PennyAndroid">
16:         <activity android:name=".MainActivity" android:exported="true">
17:             <intent-filter>
18:                 <action android:name="android.intent.action.MAIN" />
19:                 <category android:name="android.intent.category.LAUNCHER" />
20:             </intent-filter>
21:         </activity>
22:     </application>
23: </manifest>
```

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PennyReactNative/index.tsx (Page 1 of 2)

```

1: //-----
2: // index.tsx
3: // Author: Bob Dondero
4: //-----
5:
6: import React from 'react';
7: import {StyleSheet, TextInput, View, Text,
8:   Platform, StatusBar, FlatList} from 'react-native';
9: import {SafeAreaView, SafeAreaViewProvider}
10:   from 'react-native-safe-area-context';
11:
12: //-----
13:
14: function Item(props) {
15:   let book = props.book;
16:   return (
17:     <View>
18:       <Text>
19:         <Text>{book.isbn}: </Text>
20:         <Text style={styles.boldStyle}>{book.author}: </Text>
21:         <Text>{book.title}</Text>
22:       </Text>
23:     </View>
24:   );
25: }
26:
27: //-----
28:
29: export default function HomeScreen() {
30:
31:   const [books, setBooks] = React.useState([]);
32:
33:   let controller = null;
34:
35:   async function fetchBooks(author) {
36:     let encodedAuthor = encodeURIComponent(author);
37:
38:     let url = 'https://pennyjson.onrender.com/searchresults?author='
39:       + encodedAuthor;
40:
41:     if (controller !== null)
42:       controller.abort();
43:     controller = new AbortController();
44:     try {
45:       let response = await fetch(url, {signal: controller.signal});
46:       if (! response.ok)
47:         throw new Error();
48:       let books = await response.json();
49:       setBooks(books);
50:     }
51:     catch (err) {
52:       if (err.name !== 'AbortError')
53:         alert('Error: Failed to fetch data from server');
54:     }
55:   }
56:
57:   let timer = null;
58:   function debouncedFetchBooks(author) {
59:     clearTimeout(timer);
60:     timer = setTimeout(()=>{fetchBooks(author);}, 500);
61:   }
62:
63:   return (
64:     <SafeAreaViewProvider>
65:     <SafeAreaView>

```

PennyReactNative/index.tsx (Page 2 of 2)

```

66:
67:     <View>
68:       <Text style={styles.titleStyle}>
69:         Welcome to Penny.com</Text>
70:     </View>
71:
72:     <TextInput
73:       style={styles.textInputStyle}
74:       onChangeText={debouncedFetchBooks}>
75:     </TextInput>
76:
77:     <FlatList
78:       data={books}
79:       renderItem={({item}) => <Item book={item} />
80:       keyExtractor={item => item.isbn}
81:     />
82:
83:     </SafeAreaView>
84:   </SafeAreaViewProvider>
85: );
86: }
87:
88: const styles = StyleSheet.create({
89:   titleStyle: {
90:     textAlign: 'center',
91:     fontSize: 30,
92:     fontWeight: 'bold',
93:   },
94:   textInputStyle: {
95:     height: 40,
96:     borderColor: 'gray',
97:     borderWidth: 1,
98:     padding: 10
99:   },
100:   boldStyle: {
101:     fontWeight: 'bold',
102:   },
103: });

```

PennyIos/PennyIosApp.swift (Page 1 of 1)

```
1: //
2: // PennyIosApp.swift
3: // PennyIos
4: //
5: // Created by rdondero on 11/8/24.
6: //
7:
8: import SwiftUI
9:
10: @main
11: struct PennyIosApp: App {
12:     var body: some Scene {
13:         WindowGroup {
14:             ContentView()
15:         }
16:     }
17: }
```

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PennyIos/ContentView.swift (Page 1 of 2)

```

1: //
2: // ContentView.swift
3: // Penny
4: //
5: // Created by Katie DiPaola on 10/27/24.
6: //
7:
8: import SwiftUI
9: import Combine
10:
11: struct ContentView: View {
12:
13:     // Note: @State means that a variable will listen for changes and
14:     // change within the view search results
15:     @State private var books: [Book] = []
16:     // input text
17:     @State var searchText: String = ""
18:     // timer
19:     @State private var cancellable: AnyCancellable?
20:
21:
22:     var body: some View {
23:         VStack {
24:             // header
25:             Text("Welcome to Penny IOS")
26:                 .font(.system(size: 16))
27:                 .padding(.vertical, 20)
28:             Text("Author Search")
29:                 .font(.system(size: 32))
30:                 .padding(.bottom, 10)
31:             Text("Please enter an author name:")
32:
33:             // searchBar view from SearchBar.swift
34:             SearchBar(text: $searchText)
35:                 .padding(.horizontal, 20)
36:                 .padding(.bottom, 20)
37:             // when text is entered (aka input changes), delay and
38:             // then fetch from database
39:             .onChange(of: searchText) { newValue in
40:                 // Cancel the previous timer if it exists
41:                 cancellable?.cancel()
42:                 // Start a new timer for delay
43:                 cancellable = Just(newValue)
44:                     .delay(for: .milliseconds(500),
45:                           scheduler: RunLoop.main)
46:                 // fetch books from database
47:                 .sink { text in
48:                     let database = Database()
49:                     // handle completion (aka await return from
50:                     // fetchBooks)
51:                     database.fetchBooks(author: text) {
52:                         fetched_books in
53:                         self.books = fetched_books
54:                     }
55:                 }
56:             }
57:             // display result of current search
58:             NavigationView {
59:                 List(books, id: \.self) { book in
60:                     VStack (alignment: .leading){
61:                         Text(book.isbn + ": " + book.title)
62:                         Text(book.author)
63:                             .bold()
64:                     }
65:                 }

```

PennyIos/ContentView.swift (Page 2 of 2)

```

66:                             .background(Color(.systemGray6))
67:                     }
68:             }
69:         }
70:     }
71:
72: #Preview {
73:     ContentView()
74: }

```

PennyIos/SearchBar.swift (Page 1 of 2)

```

1: //
2: // SearchBar.swift
3: // Penny
4: //
5: // Created by Katie DiPaola on 10/27/24.
6: //
7:
8: import SwiftUI
9:
10: // re-used this code from my app
11: struct SearchBar: View {
12:
13:     // Note: @Binding means that the source of this variable is
14:     // elsewhere - it's a parameter of the view
15:
16:     // input text
17:     @Binding var text: String
18:     // when input is being edited
19:     @State private var isEditing = false
20:
21:     var body: some View {
22:         HStack {
23:             // input text field
24:             TextField("Search ...", text: $text)
25:                 .padding(7)
26:                 .padding(.horizontal, 25)
27:                 .background(Color(.systemGray6))
28:                 .cornerRadius(8)
29:                 // make it look pretty
30:                 .overlay{
31:                     HStack {
32:                         // uses a build-in IOS image
33:                         Image(systemName: "magnifyingglass")
34:                             .foregroundColor(.gray)
35:                             .frame(minWidth: 0, maxWidth: .infinity,
36:                                   alignment: .leading)
37:                             .padding(.leading, 8)
38:
39:                         // provide functionality to delete full user
40:                         // input
41:                         if isEditing {
42:                             Button(action: {
43:                                 self.text = ""
44:
45:                             }) {
46:                                 // uses a build-in IOS image
47:                                 Image(systemName:
48:                                     "multiply.circle.fill")
49:                                     .foregroundColor(.gray)
50:                                     .padding(.trailing, 8)
51:                             }
52:                         }
53:                     }
54:                 }
55:                 .padding(.horizontal, 10)
56:                 // track when user is editing input
57:                 .onTapGesture {
58:                     self.isEditing = true
59:                 }
60:         }
61:     }
62: }
63:
64: struct SearchBar_Previews: PreviewProvider {
65:     static var previews: some View {

```

PennyIos/SearchBar.swift (Page 2 of 2)

```

66:         // view paramter (@Binding variable from above!)
67:         SearchBar(text: .constant(""))
68:     }
69: }

```

PennyIos/Database.swift (Page 1 of 1)

```

1: //
2: // Database.swift
3: // Penny
4: //
5: // Created by Katie DiPaola on 10/27/24.
6: //
7:
8: import Foundation
9:
10: class Database {
11:
12:     let url = "https://pennyjson.onrender.com/searchresults?author="
13:
14:     // get books where author starts with text in author
15:     // completion is used for async functions to notify when the
16:     // function returns with data
17:     func fetchBooks(author: String,
18:                    completion: @escaping ([Book]) -> ()) {
19:         // exit function if author is empty
20:         if author.isEmpty {
21:             completion([])
22:             return
23:         }
24:
25:         // add author to database url
26:         let queryUrl = URL(string: url + "\(author)")!
27:         // make asynchronous http request
28:         URLSession.shared.dataTask(with: queryUrl) { data, _, error in
29:
30:             if let error = error {
31:                 print("Error fetching books: \(error)")
32:                 completion([])
33:                 return
34:             }
35:
36:             // guard lets us check if an optional value exists without
37:             // throwing an error
38:             guard let data = data
39:             else {
40:                 completion([])
41:                 return
42:             }
43:
44:             // otherwise handle json data
45:             do {
46:                 // decode into list of Book objects (defined in
47:                 // Book.swift)
48:                 let books = try JSONDecoder().decode(
49:                     [Book].self, from: data)
50:                 // completion on the main thread (UI updates must occur
51:                 // on main thread)
52:                 DispatchQueue.main.async {
53:                     completion(books)
54:                 }
55:             } catch {
56:                 print("Error decoding JSON response: \(error)")
57:             }
58:             // start task (send http request we defined above)
59:             }.resume()
60:         }
61:     }

```

PennyIos/Book.swift (Page 1 of 1)

```

1: //
2: // Book.swift
3: // Penny
4: //
5: // Created by Katie DiPaola on 10/28/24.
6: //
7:
8: import Foundation
9:
10: // book struct
11: struct Book: Codable, Hashable {
12:     let isbn: String
13:     let author: String
14:     let title: String
15: }

```