

**EnglishVocabApp**

**Software Design Document**

– Hanoi, Sept 2022 –

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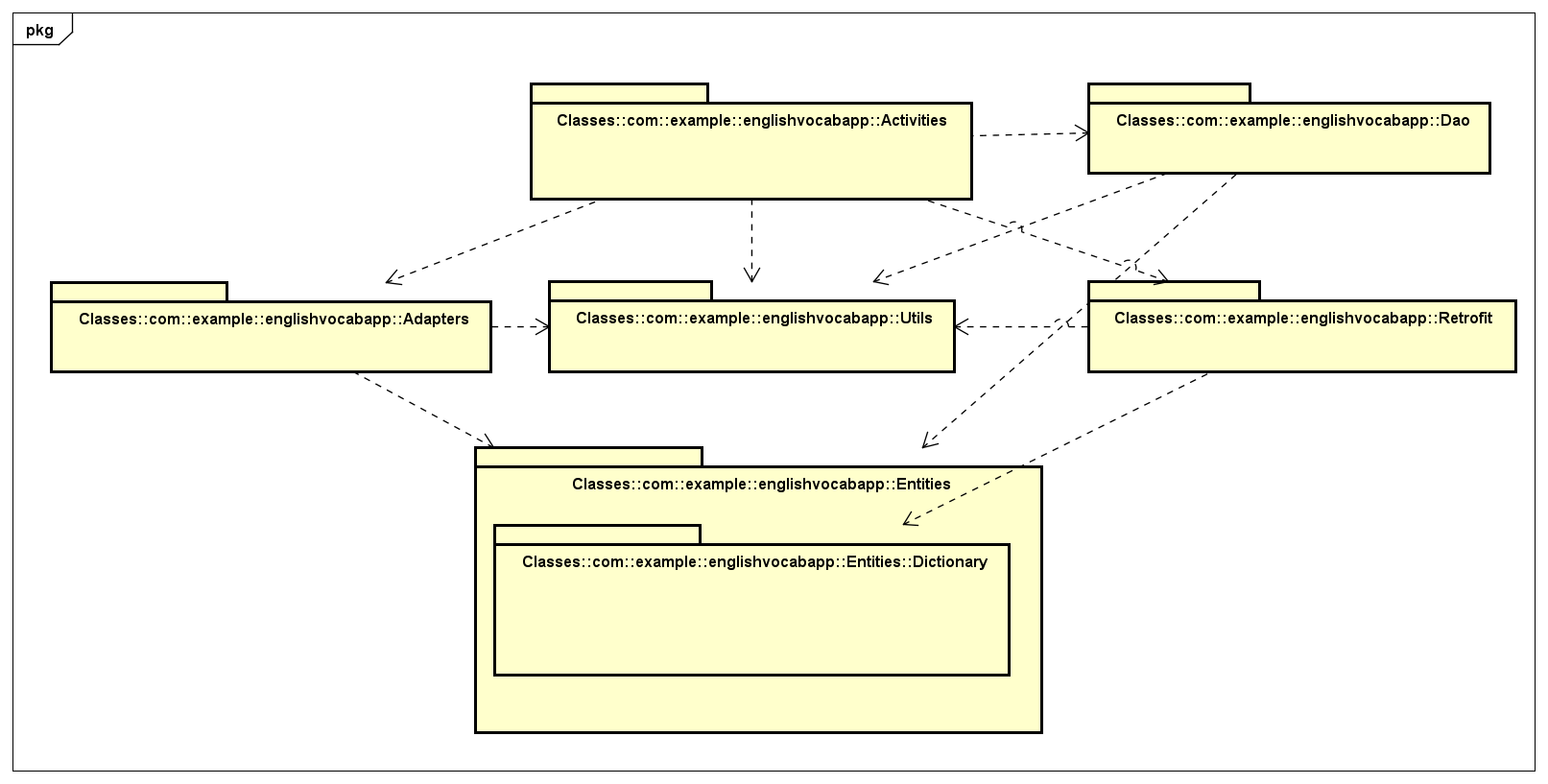
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# I. Overview

## 1. Code Packages/Namespaces

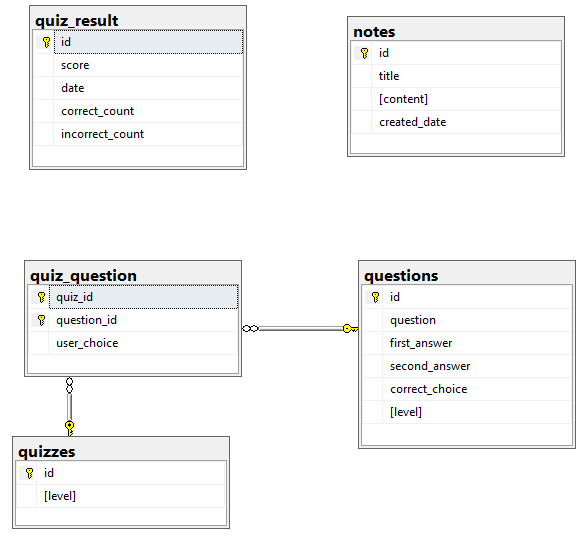


***Package descriptions & package class naming conventions***

| **No** | **Package** | **Description** |
| --- | --- | --- |
| 1 | com.example.  learnenglishapp.Activities | Contains Activity classes |
| 2 | com.example.  learnenglishapp.Adapters | Contains Adapter classes |
| 3 | com.example.  learnenglishapp.Entities | Contains Entity classes |
| 4 | com.example.  learnenglishapp.Dao | Contains DAO classes |
| 5 | com.example.  learnenglishapp.Entities.Dictionary | Contains Model classes for Dictionary |
| 6 | com.example.  learnenglishapp.Utils | Contains Utility classes |
| 7 | com.example.  learnenglishapp.Retrofit | Contains Retrofit classes |

## 2. Database Design

**2.1 Database Schema**



***Table descriptions & package class naming conventions are as below***

| **No** | **Table** | **Description** |
| --- | --- | --- |
| 01 | notes | Store Notes’ Data |
| 02 | quizzes | Store saved Quiz |
| 03 | questions | Store Questions’ Data |
| 04 | quiz\_question | Quizzes & Questions Relational Table |
| 05 | quiz\_result | Store Quizzes’ Results after finishing Quiz |

**2.2 Database table**

**Notes**

| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | id | int |  |  |  | PK |  |
| 2 | title | text | MAX |  | Y |  |  |
| 3 | content | text | MAX |  |  |  |  |

**Quizzes**

| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | id | int |  |  |  | PK |  |
| 2 | level | int |  |  | Y |  |  |

## 

**Questions**

| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | id | int |  |  |  | PK |  |
| 2 | question | text | MAX |  | Y |  |  |
| 3 | first\_answer | text | MAX |  | Y |  |  |
| 4 | second\_answer | text | MAX |  | Y |  |  |
| 5 | correct\_choice | int |  |  | Y |  |  |
| 6 | level | int |  |  | Y |  |  |

## 

**Quiz\_Question**

| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | quiz\_id | int |  |  |  | PK/FK |  |
| 2 | question\_id | int |  |  |  | PK/FK |  |
| 3 | user\_Choice | int |  |  | Y |  |  |

## 

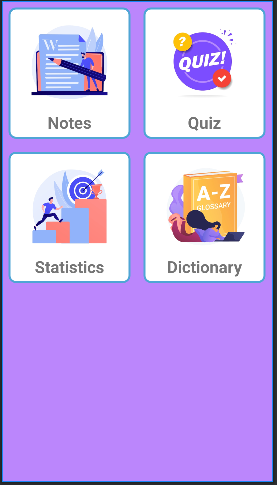
**Quiz\_Result**

| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | id | int |  |  |  | PK |  |
| 2 | score | real |  |  | Y |  |  |
| 3 | date | long | MAX |  | Y |  |  |
| 4 | correct\_count | int |  |  |  |  |  |
| 5 | incorrect\_count | int |  |  |  |  |  |

# II. Code Designs

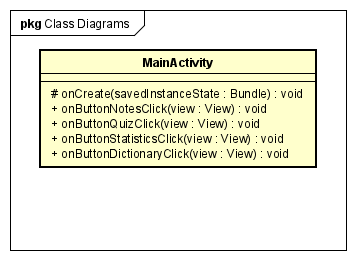
## 0. Home Screen

### a. Screen Design



| **No** | **Object/Control Name** | **Type** | **Required** | **Length** | **Description** |
| --- | --- | --- | --- | --- | --- |
| 1 | btnNotes | LinearLayout |  |  | Button to Notes |
| 2 | btnQuiz | LinearLayout |  |  | Button to Quiz |
| 3 | btnStatistics | LinearLayout |  |  | Button to Statistics |
| 4 | btnDictionary | LinearLayout |  |  | Button to Dictionary |

### b. Class Diagram

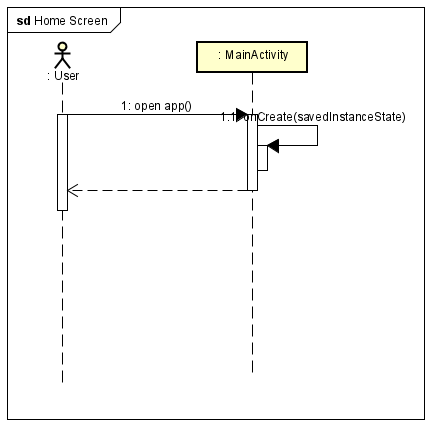


### c. Class Specifications

#### MainActivity Class

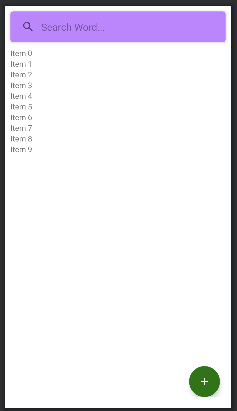
| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | onCreate | executed when activity is created |
| 02 | onButtonNoteClick | move to Note List Screen |
| 03 | onButtonQuizClick | move to Quiz Setting Screen |
| 04 | onButtonStatisticsClick | move to Statistics Screen |
| 05 | onButtonDictionaryClick | move to Dictionary screen |

### d. Sequence Diagram(s)



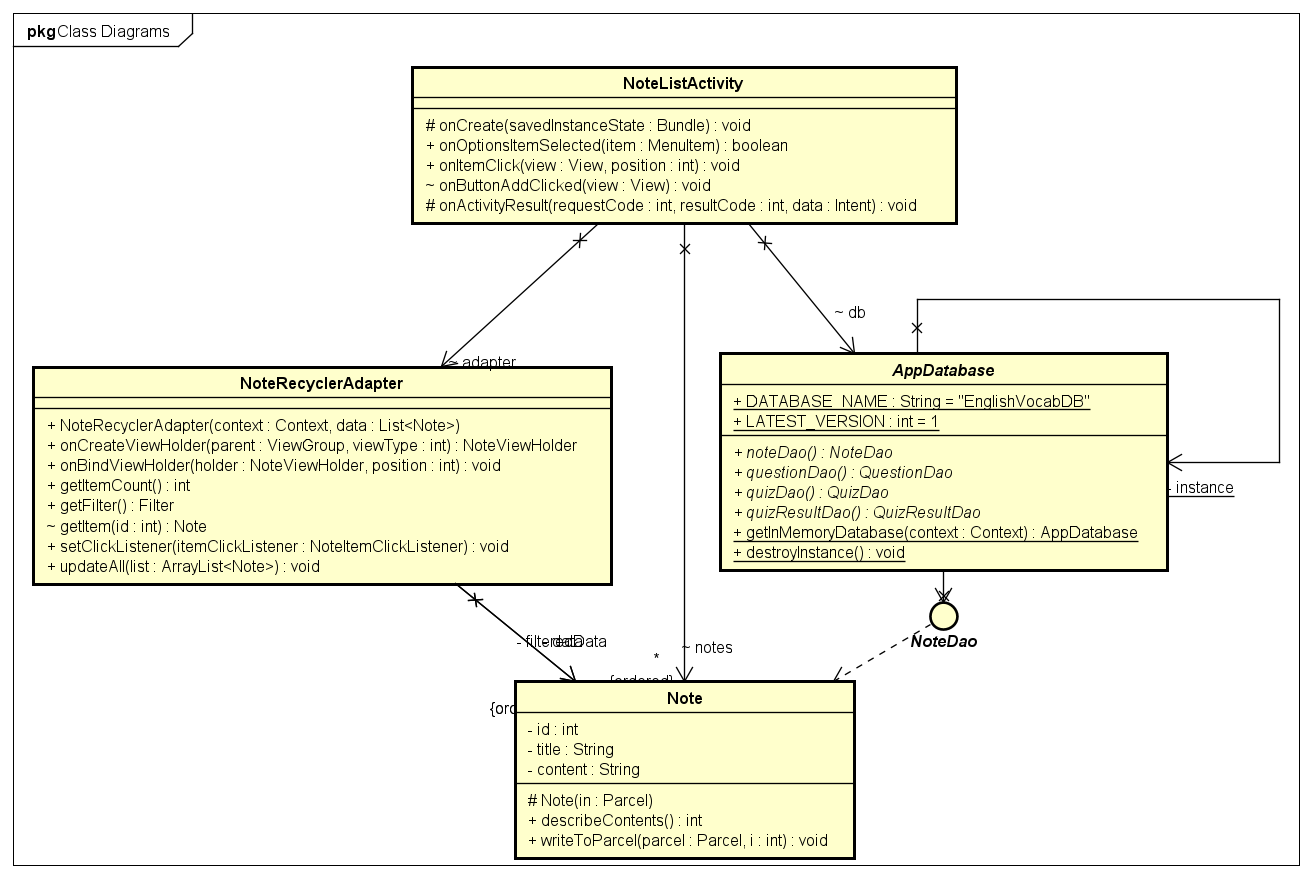
## 1. Note List

### a. Screen Design



| **No** | **Object/Control Name** | **Type** | **Required** | **Length** | **Description** |
| --- | --- | --- | --- | --- | --- |
| 1 | Search note | SearchView |  |  | Input notes which user want to find |
| 2 | Title | TextView |  |  | note’s title |
| 3 | Date | TextView |  |  | note’s date |
| 4 | Home | Button |  |  | Exit back to Home Screen |
| 5 | Add | Button |  |  | Add new Note |

### b. Class Diagram

**

### c. Class Specifications

#### NoteListActivity Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | onCreate | executed when activity is created |
| 02 | onOptionsItemSelected | execute when menu items are selected |
| 03 | onItemClick | executed when a Note item is clicked |
| 04 | onButtonAddClicked | move to Note Add Screen |
| 05 | onActivityResult | execute after returning from Note Detail or Note Add Screen |

#### AppDatabase Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | noteDao | get NoteDao |
| 02 | questionDao | get QuestionDao |
| 03 | quizDao | get QuizDao |
| 04 | quizResultDao | get QuizResultDao |
| 05 | getInMemoryDatabase | get DB instance |
| 06 | destroyInstance | destroy database instance |

#### NoteDao Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 |  | contains necessary data fetch methods |

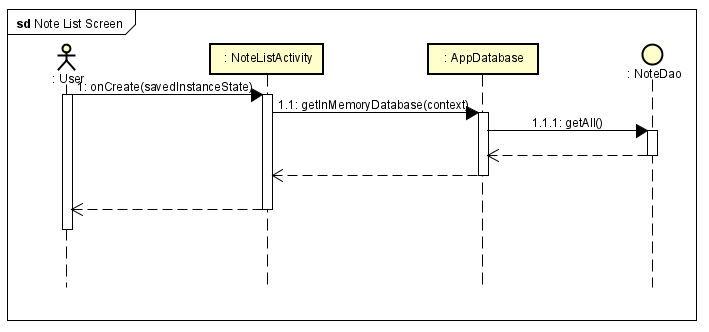
#### NoteRecyclerAdapter Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | NoteRecyclerAdapter | RecyclerViewAdapter base methods |
| 02 | onCreateViewHolder |
| 03 | onBindViewHolder |
| 04 | getItemCount |
| 05 | getFilter |
| 06 | getItem |
| 07 | setClickListener |
| 08 | updateAll |

#### Note Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 |  | implements Parcelable base methods |

### d. Sequence Diagram(s)

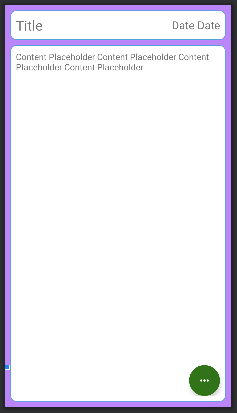


### e. Database queries

SELECT \* FROM notes ORDER BY created\_date DESC

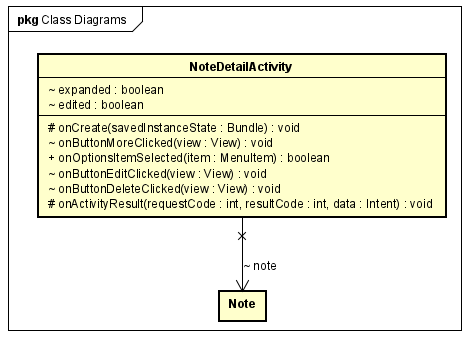
## 2. Note Details

### a. Screen Design



| **No** | **Object/Control Name** | **Type** | **Required** | **Length** | **Description** |
| --- | --- | --- | --- | --- | --- |
| 1 | Title | TextView |  |  | note’s title |
| 2 | Date | TextView |  |  | note’s date |
| 3 | content | TextView |  |  | note’s content |
| 4 | Edit Button | Button |  |  | Edit Note |
| 5 | Delete Button | Button |  |  | Delete Note |
| 6 |  |  |  |  |  |

### b. Class Diagram

**

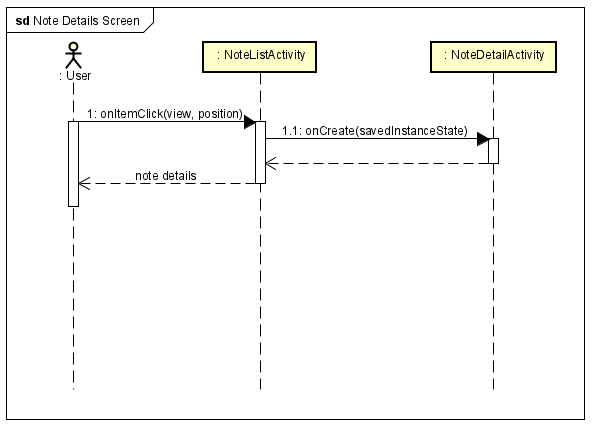
### c. Class Specifications

#### NoteDetailActivity Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | onCreate | executed when activity is created |
| 02 | onOptionsItemSelected | execute when menu items are selected |
| 03 | onButtonMoreClick | make Edit/Delete button visible/invisible |
| 04 | onButtonEditClicked | move to Note Edit Screen |
| 05 | onActivityResult | execute after returning fromNote Edit Screen |
| 06 | onButtonDeleteClicked | delete Note then return to Note List Screen |

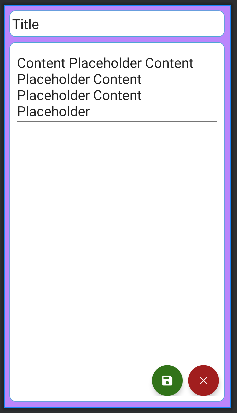
#### 

### d. Sequence Diagram(s)



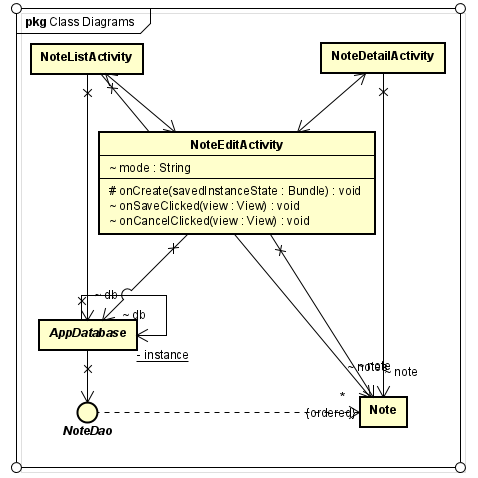
## 3. Edit/Add Note

### a. Screen Design



| **No** | **Object/Control Name** | **Type** | **Required** | **Length** | **Description** |
| --- | --- | --- | --- | --- | --- |
| 1 | Note Title | EditText | Yes |  | Input title of note |
| 2 | Note Content | EditText |  |  | Input content of note |
| 3 | Save | Button |  |  | Save Edit/Add Note |
| 4 | Cancel | Button |  |  | Cancel Save/Edit |

### b. Class Diagram

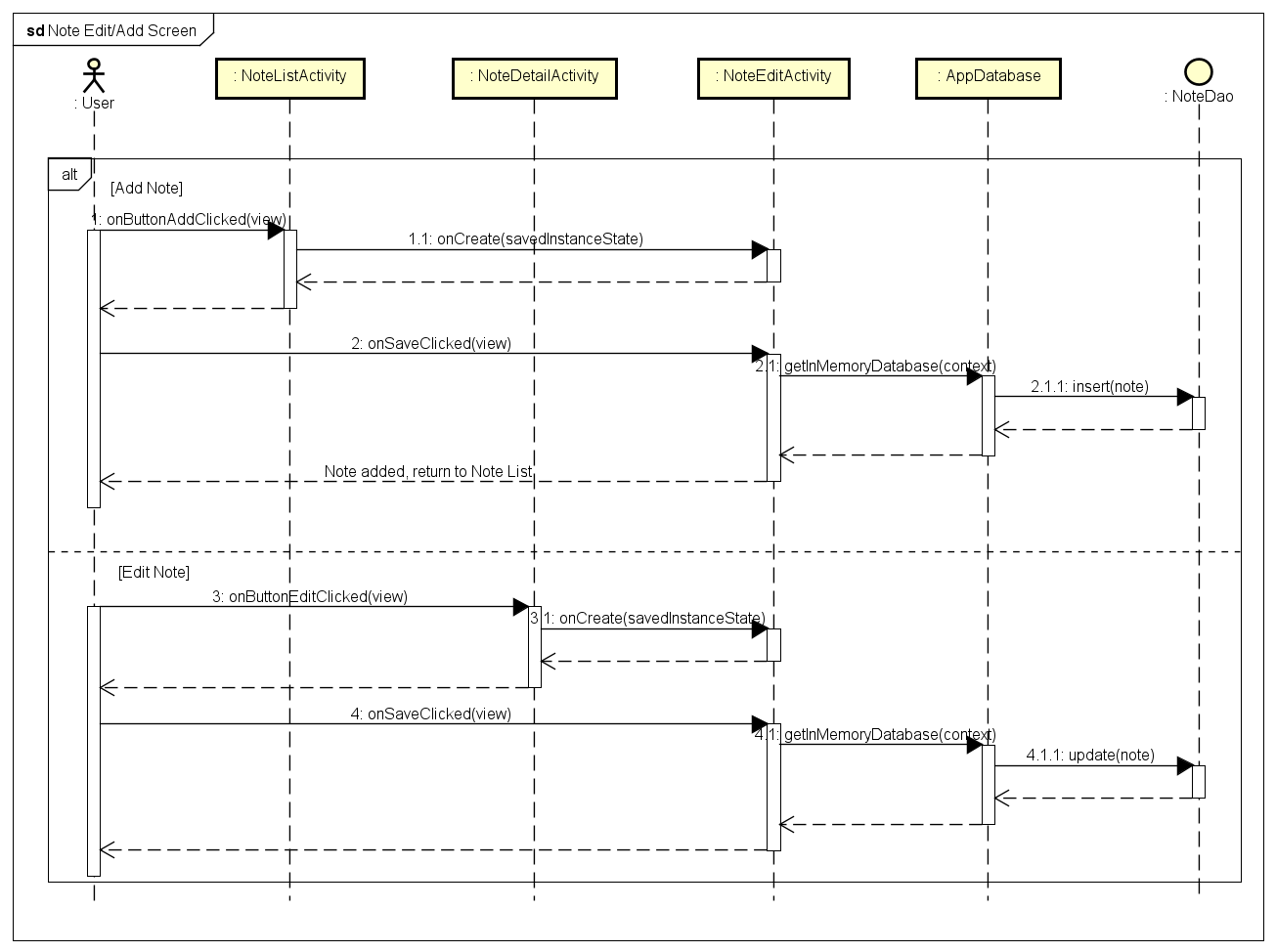
**

### c. Class Specifications

#### NoteEditActivity Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | onCreate | executed when activity is created |
| 02 | onSaveClicked | execute when [Save] is clicked |
| 03 | onCancelClicked | executed when a [Cancel] is clicked |

### d. Sequence Diagram(s)



### e. Database queries

* INSERT INTO notes VALUES (...)
* UPDATE notes WHERE id = :id SET […]

## 4. Search Notes

### a. Screen Design

Refer to Note List

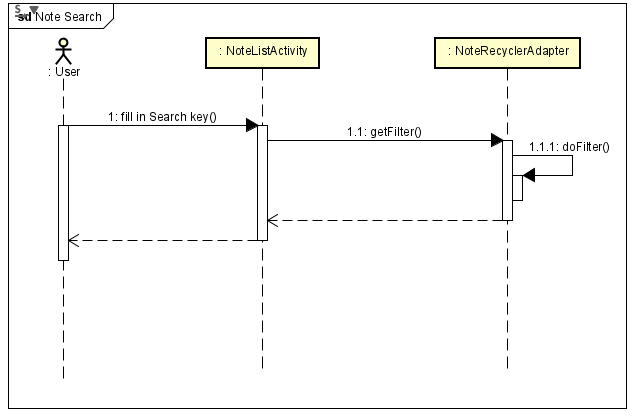
### b. Class Diagram

Refer to Note List

### c. Class Specifications

Refer to Note List

### d. Sequence Diagram(s)



### e. Database queries

Refer to Note List

## 5. Delete Note

### a. Screen Design

Refer to Note Details

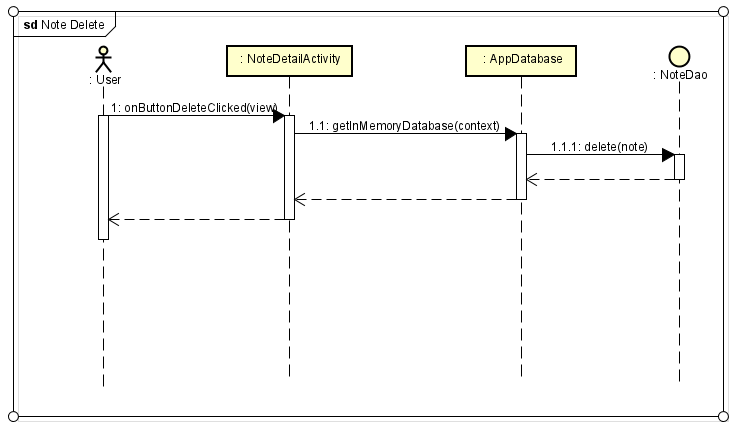
### b. Class Diagram

Refer to Note Details

### c. Class Specifications

Refer to Note Details

### d. Sequence Diagram(s)

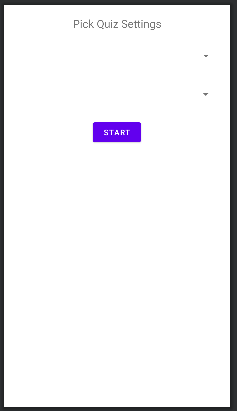


### e. Database queries

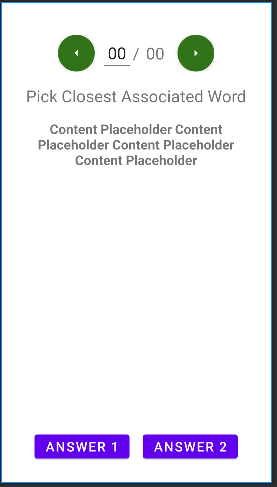
* DELETE FROM notes WHERE id = :id

## 6. Play Quiz

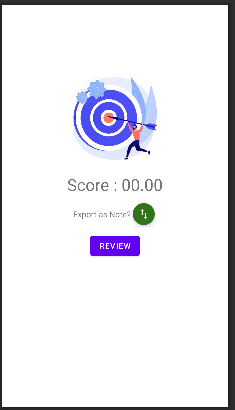
### a. Screen Design



| **No** | **Object/Control Name** | **Type** | **Required** | **Length** | **Description** |
| --- | --- | --- | --- | --- | --- |
| 1 | spinner\_level | Spinner | Yes | 20 | Pick Quiz Level, defaultValue = ‘Pick Quiz Level’ |
| 2 | spinner\_length | Spinner |  |  | Pick Quiz Length, defaultValue = ‘Pick Quiz Length’ |
| 3 | Start | Button |  |  | Start Quiz |

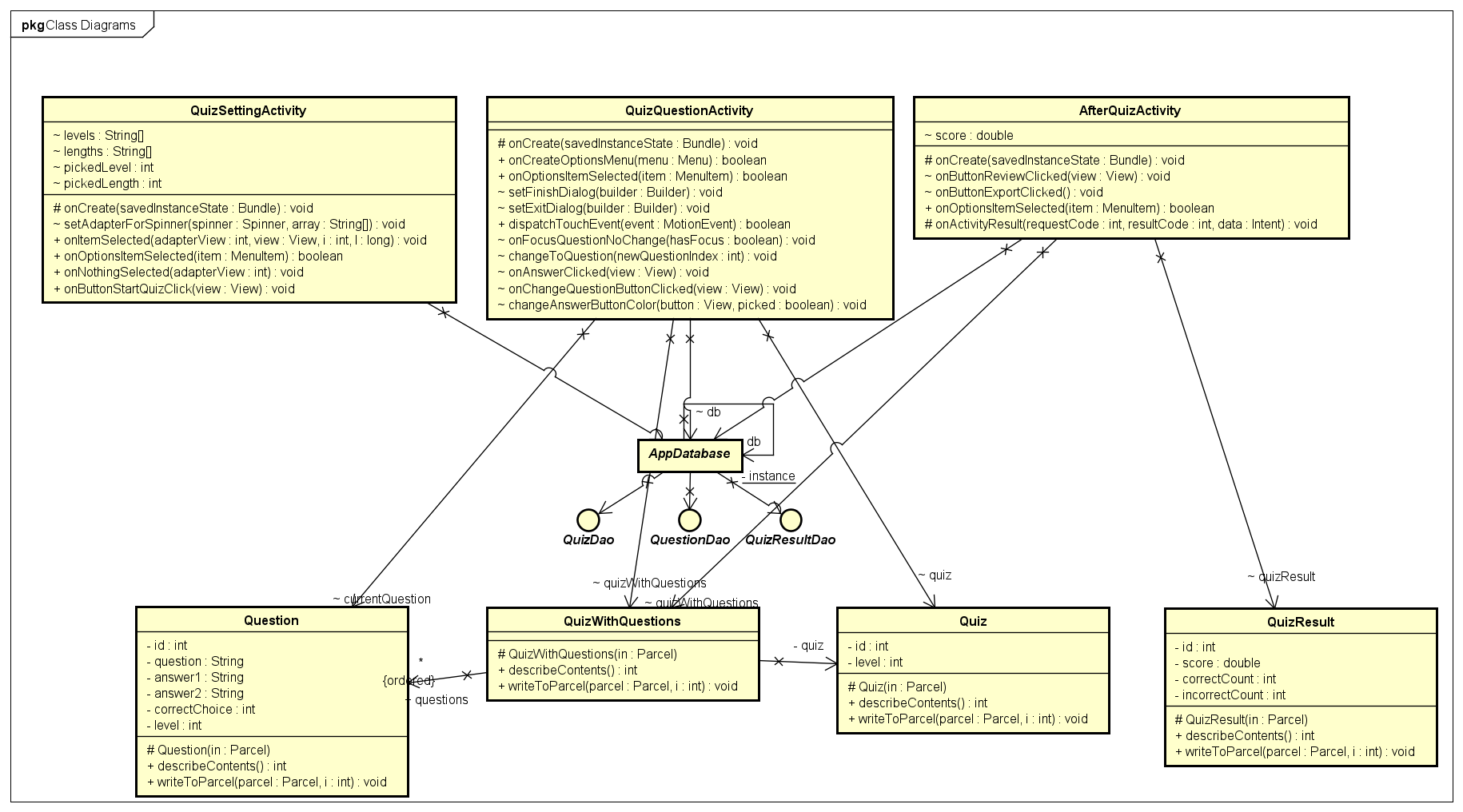


| **No** | **Object/Control Name** | **Type** | **Required** | **Length** | **Description** |
| --- | --- | --- | --- | --- | --- |
| 1 | Exit | Menu option |  |  | show pop-up whether to Save Quiz progress when exiting |
| 2 | fab\_prev | FloatingActionButton |  |  | Move to previous question |
| 3 | fab\_next | FloatingActionButton |  |  | Move to next question |
| 4 | txt\_questionNo | EditText |  | 2 | show current question number & move to new question on change |
| 5 | txt\_questionTotal | TextView |  | 2 | show total number of questions |
| 6 | Finish | Menu option |  |  | Finish Quiz |
| 7 | txt\_questionContent | TextView |  |  | Show Question content |
| 8 | btn\_answer1 | Button |  |  | Show answer choice |
| 9 | btn\_answer2 | Button |  |  | Show answer choice |



| **No** | **Object/Control Name** | **Type** | **Required** | **Length** | **Description** |
| --- | --- | --- | --- | --- | --- |
| 1 | txt\_score | TextView |  |  | show quiz score |
| 2 | btn\_review | Button |  |  | Move to Quiz Review Screen |
| 3 | btn\_return | Button |  |  | Return to Home |
| 4 | fab\_export | FloatingActionButton |  |  | Export quiz questions & answers to Note |

### b. Class Diagram



### c. Class Specifications

#### QuizSettingActivity Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | onCreate | executed when activity is created |
| 02 | onOptionsItemSelected | execute when menu items are selected |
| 03 | setAdapterForSpinner | setup adapter for spinners |
| 04 | onItemSelected | executed when a spinner item is clicked |
| 06 | onNothingSelected | base methods of adapter |
| 07 | onButtonStartQuizClick | move to Quiz Question Screen |
|  |  |  |

#### QuizQuestionActivity Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | onCreate | executed when activity is created |
| 02 | onCreateOptionsMenu | create option menu containing [Finish] & [Exit] buttons |
| 03 | onOptionsItemSelected | execute when menu items are selected |
| 04 | setFinishDialog | setup finish dialog |
| 05 | setExitDialog | setup exit dialog |
| 06 | changeToQuestion | change question displayed on the screen |
| 07 | onAnswerClicked | executed when an answer is picked |
| 08 | onChangeQuestionButtonClicked | executed when prev or next button is clicked |
| 09 | changeAnswerButtonColor | change button color when displayed question is changed or when user picks an answer |
|  |  |  |

#### AfterQuizActivity Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | onCreate | executed when activity is created |
| 02 | onOptionsItemSelected | execute when menu items are selected |
| 03 | onButtonReviewClicked | move to review Screen |
| 04 | onButtonExportClicked | move to Note Edit Screen |
| 05 | onActivityResult | executed when user finishes Exporting Quiz Result to Note |
|  |  |  |

#### 

#### Quiz Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 |  | implements Parcelable base methods |

#### Question Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 |  | implements Parcelable base methods |

#### 

#### QuizWithQuestions Class

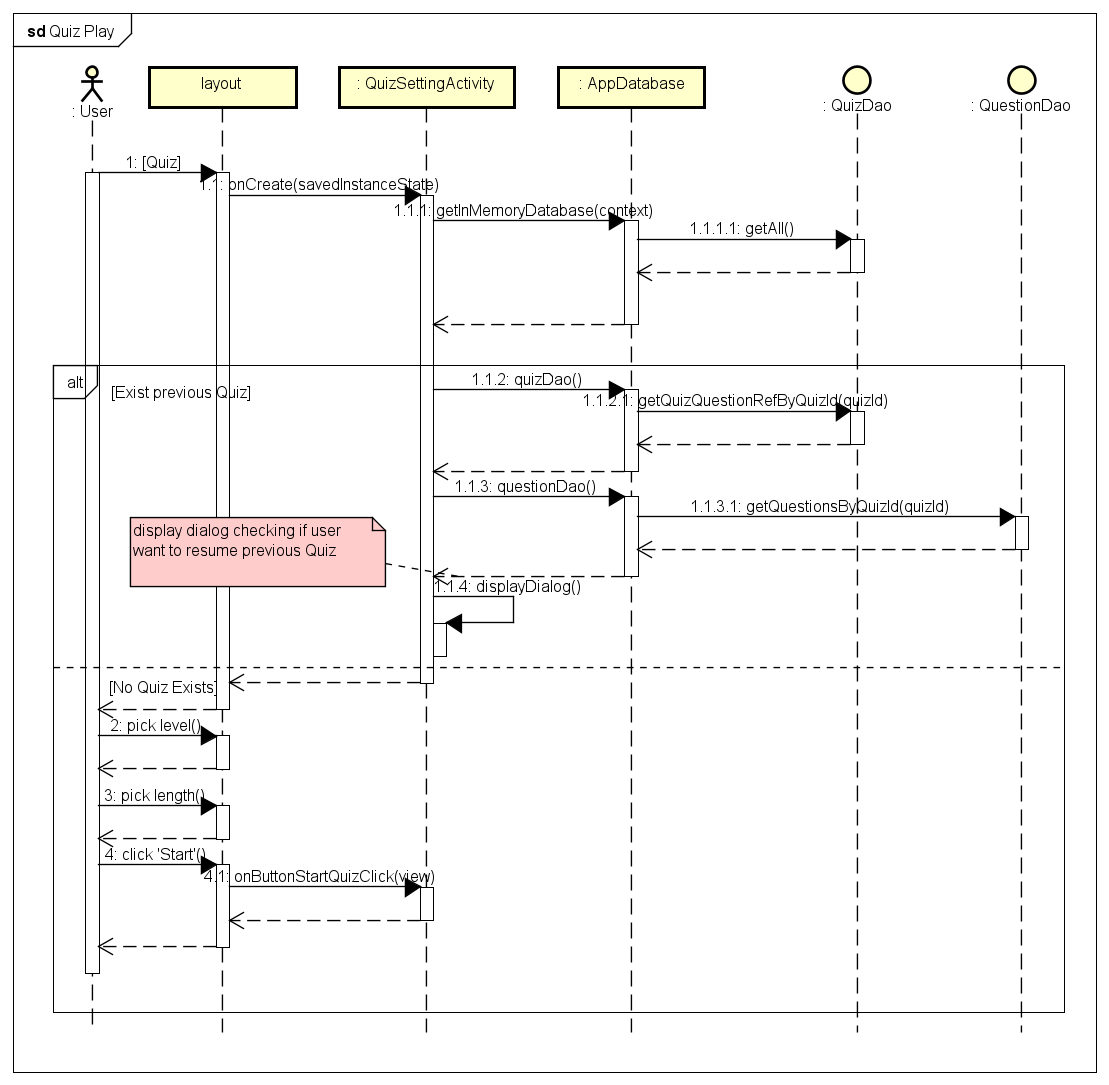
| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 |  | implements Parcelable base methods |

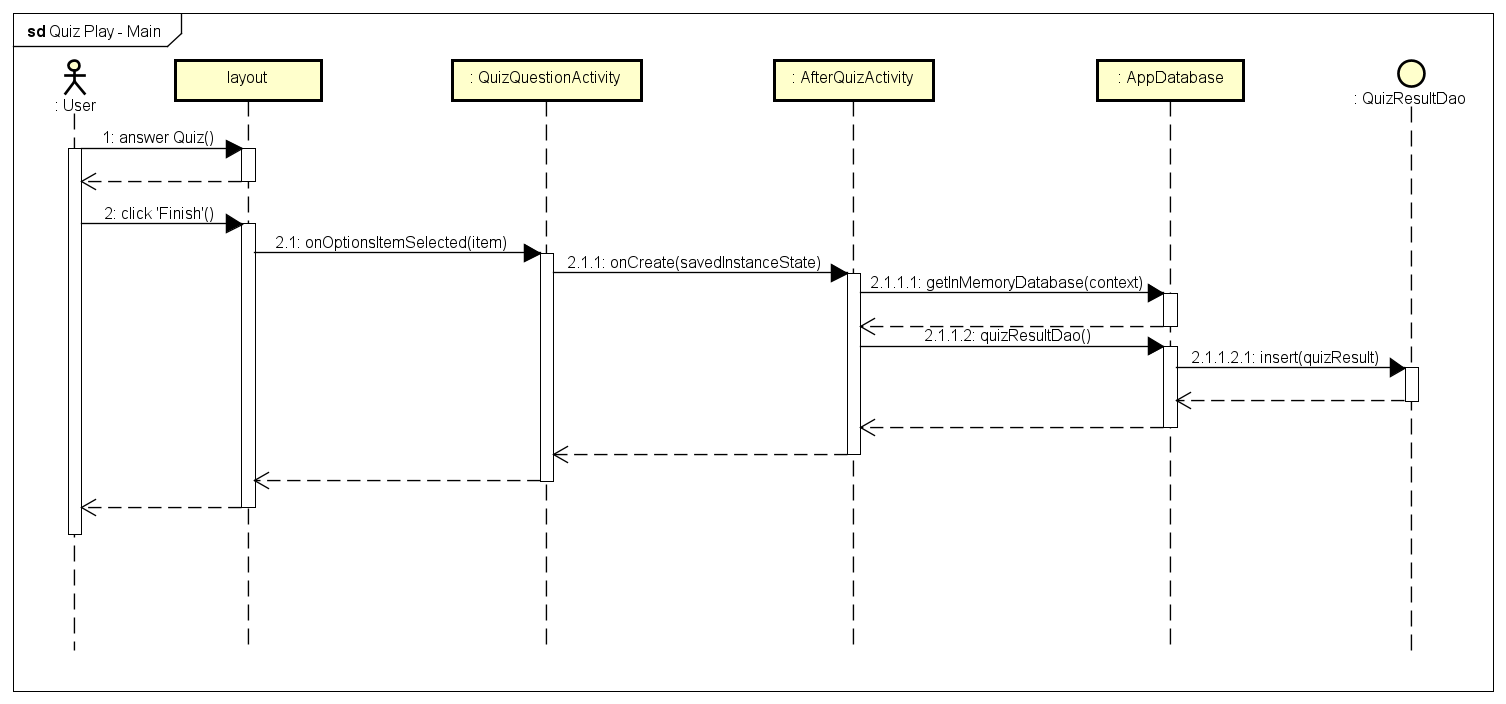
#### 

#### QuizResult Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 |  | implements Parcelable base methods |

### d. Sequence Diagram(s)





### e. Database queries

* SELECT \* FROM quizzes
* SELECT \* FROM quiz\_question WHERE quiz\_id = :quizID
* SELECT id FROM questions WHERE level = :level
* SELECT \* FROM questions WHERE id = :id
* INSERT INTO quizzes VALUES (...)
* INSERT INTO quiz\_question VALUES (...)
* DELETE \* FROM quizzes
* DELETE \* FROM quiz\_question
* INSERT INTO quiz\_result VALUES (...)

## 7. Export Quiz Result To Note

### a. Screen Design

Refer to Play Quiz’s After Quiz Screen & Note Edit Screen

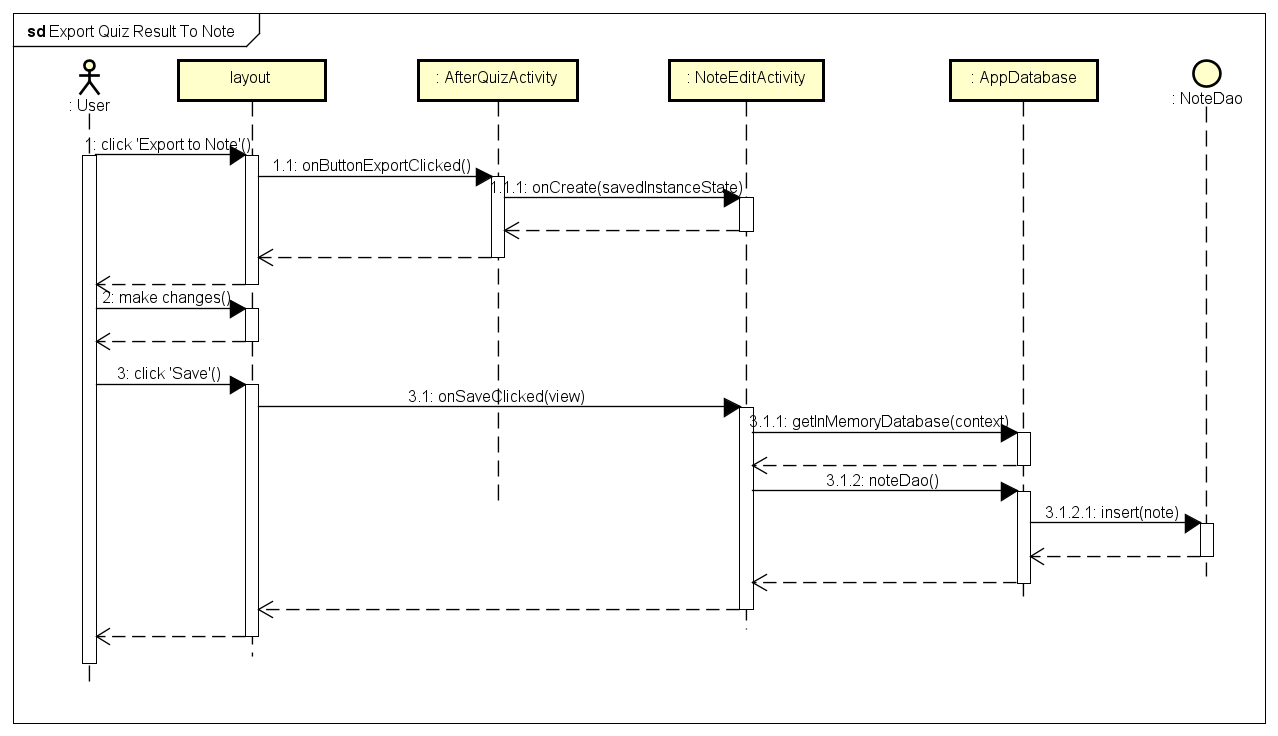
### b. Class Diagram

Refer to previous sections in Note & Quiz

### c. Class Specifications

Refer to previous sections in Note & Quiz

### d. Sequence Diagram(s)

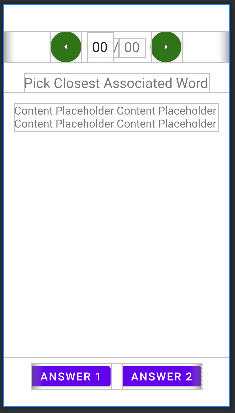


### e. Database queries

* INSERT INTO notes VALUES (...)

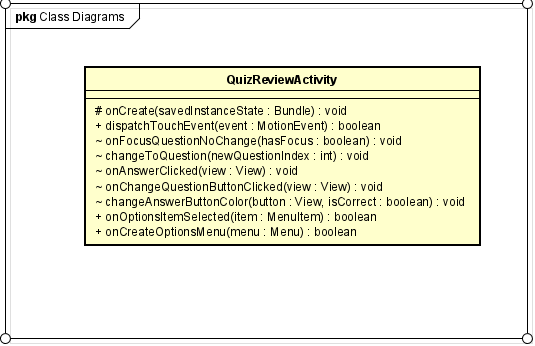
## 8. Review Quiz

### a. Screen Design



| **No** | **Object/Control Name** | **Type** | **Required** | **Length** | **Description** |
| --- | --- | --- | --- | --- | --- |
| 1 | fab\_prev | FloatingActionButton |  |  | Move to previous question |
| 2 | fab\_next | FloatingActionButton |  |  | Move to next question |
| 3 | txt\_questionNo | EditText |  | 2 | show current question number & move to new question on change |
| 4 | txt\_questionTotal | TextView |  | 2 | show total number of questions |
| 5 | txt\_questionContent | TextView |  |  | Show Question content |
| 6 | btn\_answer1 | Button |  |  | Show answer choice |
| 7 | btn\_answer2 | Button |  |  | Show answer choice |

### b. Class Diagram

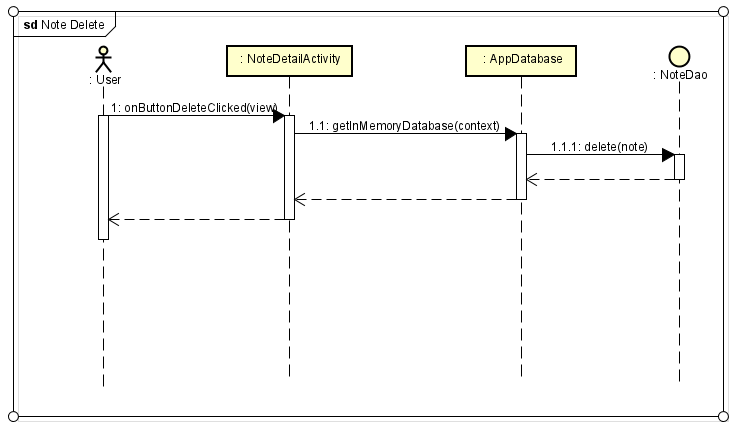


### c. Class Specifications

#### QuizQuestionActivity Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | onCreate | executed when activity is created |
| 02 | onCreateOptionsMenu | create option menu containing [Finish] & [Exit] buttons |
| 03 | onOptionsItemSelected | execute when menu items are selected |
| 04 | changeToQuestion | change question displayed on the screen |
| 05 | onAnswerClicked | executed when an answer is clicked, move to Dictionary Screen |
| 06 | onChangeQuestionButtonClicked | executed when prev or next button is clicked |
| 07 | changeAnswerButtonColor | change button color when displayed question is changed |

### d. Sequence Diagram(s)

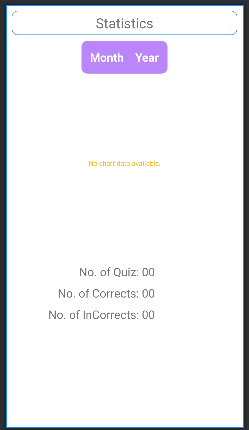


### e. Database queries

* DELETE FROM notes WHERE id = :id

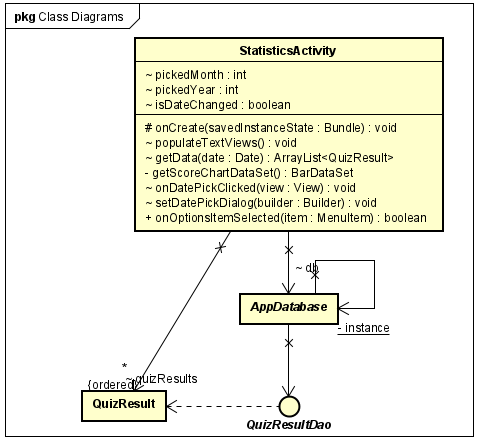
## 9. View Statistics

### a. Screen Design



| **No** | **Object/Control Name** | **Type** | **Required** | **Length** | **Description** |
| --- | --- | --- | --- | --- | --- |
| 1 | Month - Year | DatePickDialog |  |  | Allow user to choose a month to display on bar chart |
| 2 | Bar Chart | MPAndroidChart.BarChart |  |  | Show A Month’s Quiz results |
| 3 | txt\_NoOfQuiz | TextView |  |  | Total number of Quizzes done in cohen Month |
| 4 | txt\_correct | TextView |  |  | Total number of correct answers |
| 5 | txt\_incorrect | TextView |  |  | Total number of incorrect answers |

### b. Class Diagram

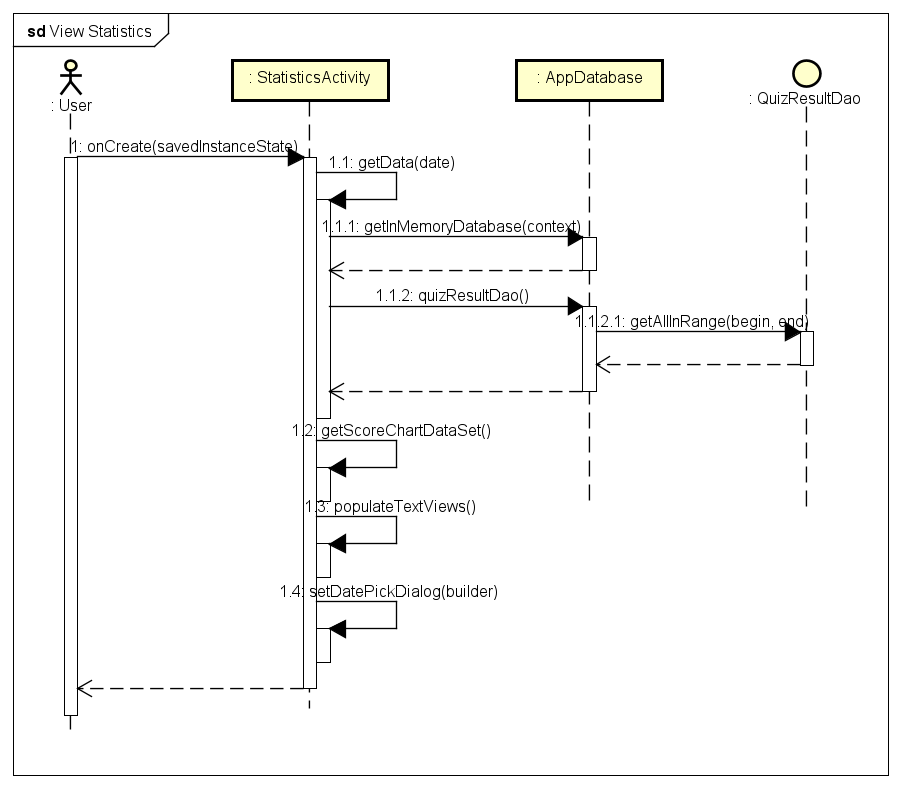


### c. Class Specifications

#### StatisticsActivity Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | onCreate | executed when activity is created |
| 02 | getData | fetch Quiz Result data |
| 03 | onOptionsItemSelected | execute when menu items are selected |
| 04 | getScoreChartDataSet | set up bar chart dataset |
| 05 | populateTextViews | populate statistics text views |
| 06 | onDatePickedClicked | show date picker dialog |
| 07 | setDatePickDialog | setup date pick dialog |

### d. Sequence Diagram(s)

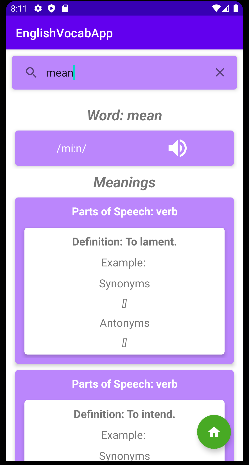


### e. Database queries

* SELECT \* FROM quiz\_result WHERE date BETWEEN :begin AND :end ORDER BY date ASC

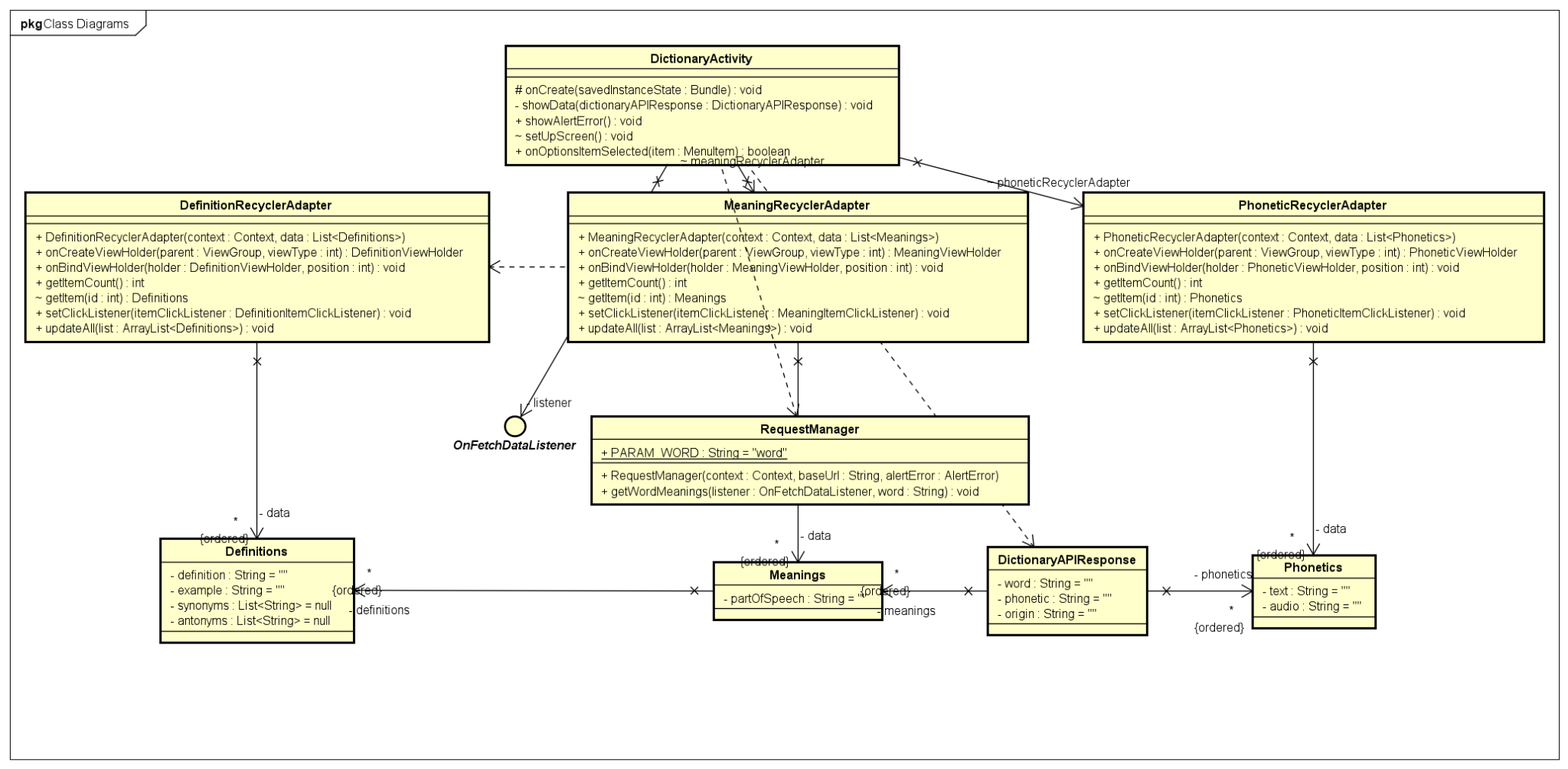
## 10. Search Dictionary

### a. Screen Design



| **No** | **Object/Control Name** | **Type** | **Required** | **Length** | **Description** |
| --- | --- | --- | --- | --- | --- |
| 1 | search\_view | SearchView | Yes | 30 | Search input |
| 2 | txt\_word | TextView |  |  | Display searched Word |
| 3 | txt\_phonetics | TextView |  |  | Display word’s phonetics |
| 4 | btn\_play | ImageButton |  |  | Play phonetics via MediaPlayer |
| 5 | txt\_definition | TextView |  |  | Show word’s definitions |
| 6 | txt\_partOfSpeech | TextView |  |  | Show word’s part of speech |
| 7 | txt\_example | TextView |  |  | Show word’s use example |
| 8 | txt\_synonyms | TextView |  |  | Show synonyms |
| 9 | txt\_antonyms | TextView |  |  | Show antonyms |

### b. Class Diagram



### c. Class Specifications

#### DictionaryActivity Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | onCreate | executed when activity is created |
| 02 | showAlertError | show error message when task fail |
| 03 | onOptionsItemSelected | execute when menu items are selected |
| 04 | setUpScreen | setup Screen |
| 05 | showData | show search result data |

#### 

#### DefinitionRecyclerAdapter Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | DefinitionRecyclerAdapter | RecyclerViewAdapter base methods |
| 02 | onCreateViewHolder |
| 03 | onBindViewHolder |
| 04 | getItemCount |
| 05 | getItem |
| 06 | setClickListener |
| 07 | updateAll |

#### MeaningRecyclerAdapter Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | MeaningRecyclerAdapter | RecyclerViewAdapter base methods |
| 02 | onCreateViewHolder |
| 03 | onBindViewHolder |
| 04 | getItemCount |
| 05 | getItem |
| 06 | setClickListener |
| 07 | updateAll |

#### PhoneticRecyclerAdapter Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | PhoneticRecyclerAdapter | RecyclerViewAdapter base methods |
| 02 | onCreateViewHolder |
| 03 | onBindViewHolder |
| 04 | getItemCount |
| 05 | getItem |
| 06 | setClickListener |
| 07 | updateAll |

#### RequestManager Class

| **No** | **Method** | **Description** |
| --- | --- | --- |
| 01 | RequestManager | constructor |
| 02 | getWordMeanings | fetch searched word’s meanings through API |

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### d. Sequence Diagram(s)

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