Project Part 6 Contribution:

Realm-Java

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March 15, 2020

ABSTRACTION

Objectives

In this report, we contributed our second pull request for one selected issue in realm-java.

Source Code

Repository: https://github.com/solution-accepted/realm-java

Branch: issue-1050-fix

CONTRIBUTION

Issue #1050

https://github.com/realm/realm-java/issues/1050

The issue we want to solve is #1050. This issue was opened by Sani crysan. He suggested to add findLast(int), findFirst(int) and findRandom(int). The new feature would be useful when the app does not have real data or The database is too large. The findLast(int) and findFirst(int) function are commonly used in database operation.

Goal

The goal of our second pull request is to realize the new features findLast(int), findFirst(int), findRandom(int). Their usages are shown below:

```
public void example() {
  // Query Realm for all dogs
  final RealmResults<Dog> puppies = realm.where(Dog.class).findAll();
  // Query Realm for first 10 dogs
  final RealmResults<Dog> firstTenPuppies = realm.where(Dog.class).findFirst(10);
  // Query Realm for last 10 dogs
  final RealmResults<Dog> lastTenPuppies = realm.where(Dog.class).findLast(10);
  // Query Realm for random 10 dogs
  final RealmResults<Dog> randomTenPuppies = realm.where(Dog.class).findRandom(10);
}
```

Solution

First, we went through all the discussion under the issue, and we found the comment might be a beacon. There, user emanuelez said: "Be aware that RealmResult is lazy and does not copy data to memory at any point. That means that the proposed methods are very easily replaced with RealmResult.get() with no additional memory or performance cost[1]." In our opinion, RealmResult should be a typo of "RealmResults". RealmResults is a class designed for storing results of queries. It is a subclass of OrderedRealmCollectionImpl that implements the Java List interface, so RealmResults does have a "get" method like normal List objects. But for such a database library like Realm, we should keep consistency among all previous methods. The

existing "findAll" method returns RealmResults, so we want to follow this convention and make our new features also return RealmResults. The comment from emanuelez implies that users can utilize the "get" method to achieve their goals, but is not helpful for developers who contribute to this project.

Secondly we drew the call graph in Figure 1 of the existing methods "findFirst" and "findAll". We can see that findFirst may depend on findAll. That suggests our features might have similar logic like findFirst which is built upon findAll.
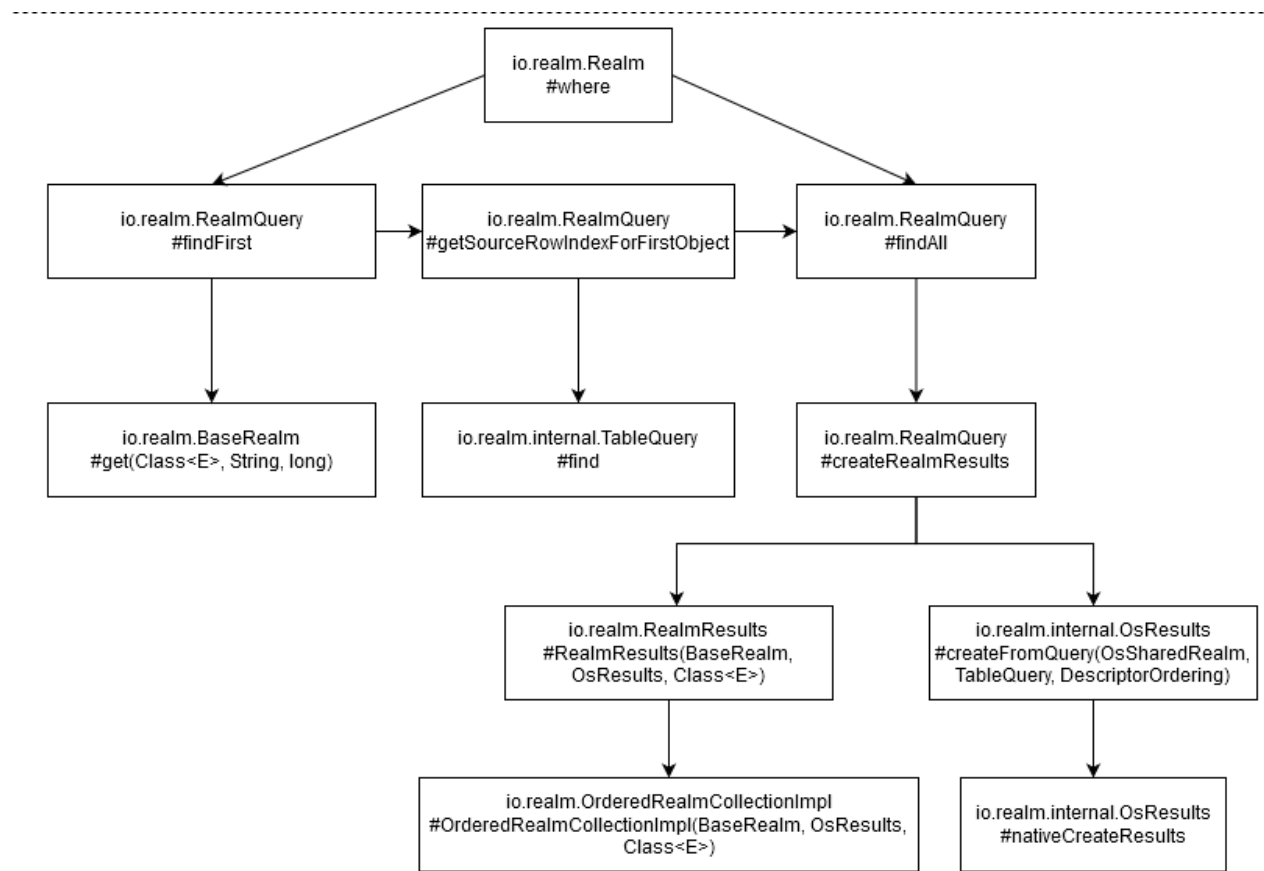
Figure 1: Call Graph of the methods "findFirst" and "findAll"

Finally, by combining "limit" and "findAll", we completed our versions of findLast(int), findFirst(int), findRandom(int). All of them return RealmResults which conform to the coding standard. Here is the pull request for this implementation: https://github.com/realm/realm-java/pull/6778.

REFERENCES

[1] emanuelez's comment https://github.com/realm/realm-java/issues/1050#issuecomment-123000031