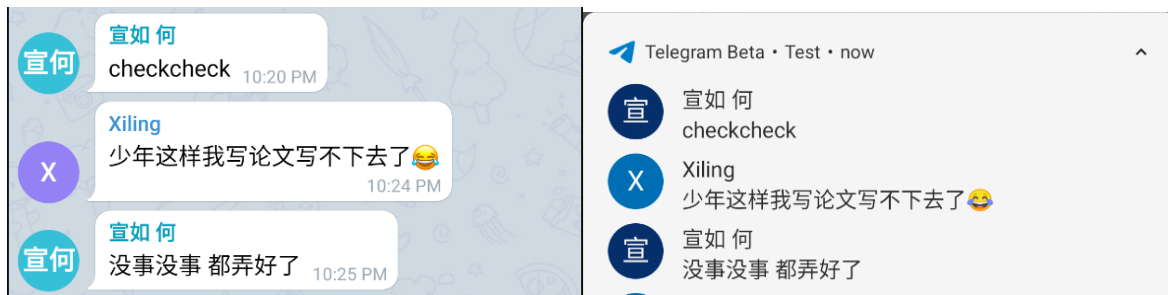# Change order of new message notification – Issue fixed

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1. Introduction

This report aims to display the work of fixing an issue of an open source project, Telegram. Telegram is an open source project on GitHub, and programmers are able to pull request to the project owner to fix issues. As there is no open issue in the Telegram repository, our work includes finding issues from not merged pull requests and solving the issue in our own way. The report is organized to the following structure to introduce the issue and our work. First, what the issues is and why the issue exist is explained. Then, our work to solve the issue is shown. At last, future work about the issue is discussed.

2. Issue Description

The issue was raised in the pull request #1402. Telegram inverts the order of messages in the notifications. The notification is shown as the input order, for example:

The left figure is the input order and the right figure is notification order. However, in most chat applications and message applications, the notification order is inverted, e.g. the most recent message is at the top. Thus, we need to invert the notification displaying order to adjust to everyone's habit.

The issue comes from the way that Telegram put new messages into the notification arraylist. The code in NotificationController.java is:


```
694                    pushMessages.add( index: 0, messageObject);
```
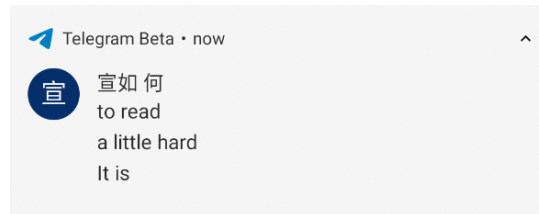
which add the new message to the first position of the arraylist. Then the notification is shown from the last one and the newest is always at the buttom. To solve the issue, we need to change the way the message put into the arraylist.

3. Issue solving

To solve the issue, we first changed the mentioned code to:

```
 694                                          pushMessages.add( messageObject);
```
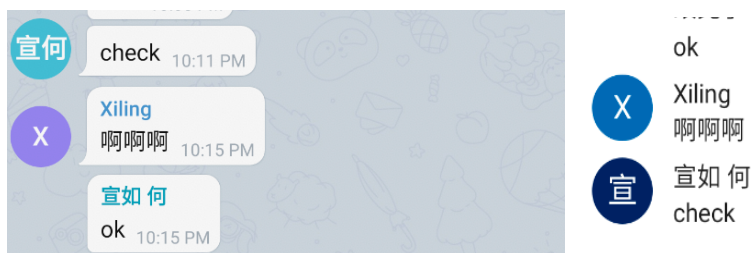
In this way, the new message is put to the end of the arraylist and shown on the top of the notification. However, we notice that in personal chat, not group chat, the inverted order is a little confusing, because all the messages are shown in the same notification. For example

It is a little hard to read though. Thus, we decided to use inverted order for group chat, which is same as other chat applications and Telegram IOS version, and use the not inverted order for personal chat, which is easy to read. The code is as follow:

```
 693          if (!isPersonalMessage(messageObject)) {
 694              pushMessages.add( messageObject);
 695          }
 696          else {
 697              pushMessages.add( index: 0, messageObject);
 698          }
```

First, we check if the message is a personal message. If it is not a personal message, we put the message to the end of the notification. If it is, we put it to the front of the notification.
The result for inverted group chat is like:

The left figure is the input order and the right figure is the notification order.

4. Future work
To fix this issue, other works can be done. For example, we can add a toggle to the notification setting to allow user to choose the order they like. Also, it could show message in different notifications and invert all chat orders, which is more like other applications.