

Mobile Applications

CSCI 448

Lecture 16



Usability: Localization & Accessibility

Real Time Bug Tracking

Previously in CSCI 448



- NavGraph & Arguments
 - Used for navigation through screens

Questions?



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Learning Outcomes For Today



- Discuss how to provide locale support and the need for localization
- Discuss how to make apps accessible for visually impaired
- Add bug reporting to our apps

On Tap For Today



- Accessibility
- Bug Reports

On Tap For Today



- Accessibility
- Bug Reports

Language Support



- Already discussed need for strings.xml file
- LTR and RTL support
 - Use start/end instead of left/right
 - Add to manifest application tag

```
<manifest ...>  
  <application  
    android:supportsRtl="true"  
  ...>
```

TalkBack



- Accessibility service
 - Reads information from the screen
- Need physical device (not available on emulator)
 - Settings > Accessibility

Make Non-Text Elements Readable



- Set the content description

```
Image (  
    painter = painterResource(id = R.drawable.sunrise)  
    contentDescription = stringResource(id = R.string.sunrise)  
)
```

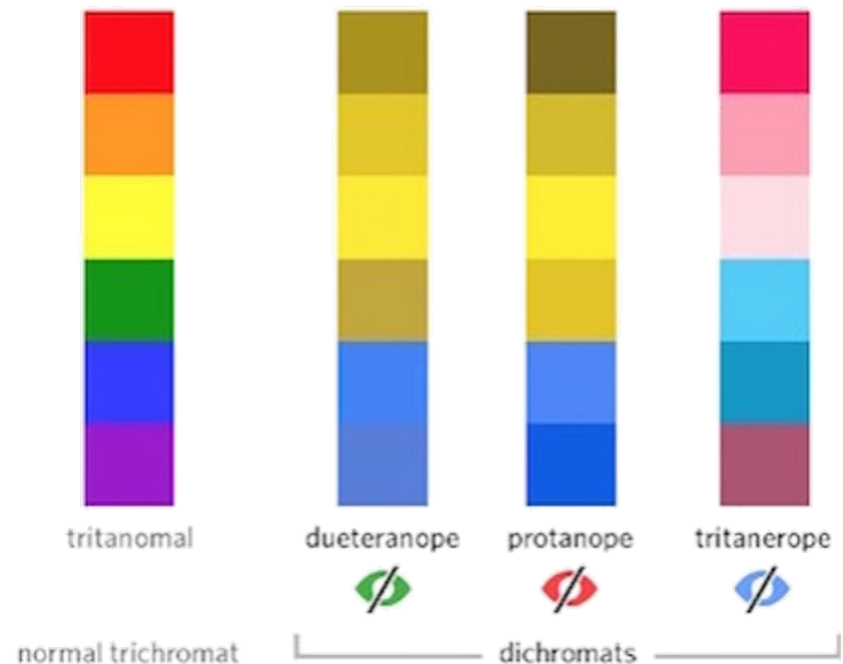
Demo



Color Contrast



- Consider color choices
 - <https://www.getfeedback.com/resources/ux/how-to-design-for-color-blindness/>
- Poor choices
 - Green & Red
 - Green & Brown
 - Blue & Purple
 - Green & Blue
 - Green & Yellow
 - Blue & Grey
 - Green & Grey
 - Green & Black



Accessibility Tips



1. Use colors and symbols (don't rely on color to display information)
2. Use limited color palette
3. Use texture and patterns to show contrast
4. Select colors that have high contrast
5. Avoid using poor color combinations

<https://webaim.org/resources/contrastchecker/>

On Tap For Today



- Accessibility
- Bug Reports

Firebase Crashlytics



- Real Time Bug Reporting

<https://firebase.google.com/products/crashlytics>

Steps to Use



- <https://firebase.google.com/docs/crashlytics/get-started?authuser=0&platform=android>
1. Create project in console
 - Add app (need package ID)
 2. Add Google Services file to project
 - Add Firebase to gradle files

Admin Panel



Analytics

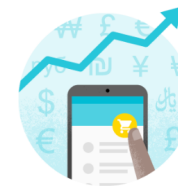
Daily active users

0



Day 1 retention

No data
for the last 14 days



Track your revenue!

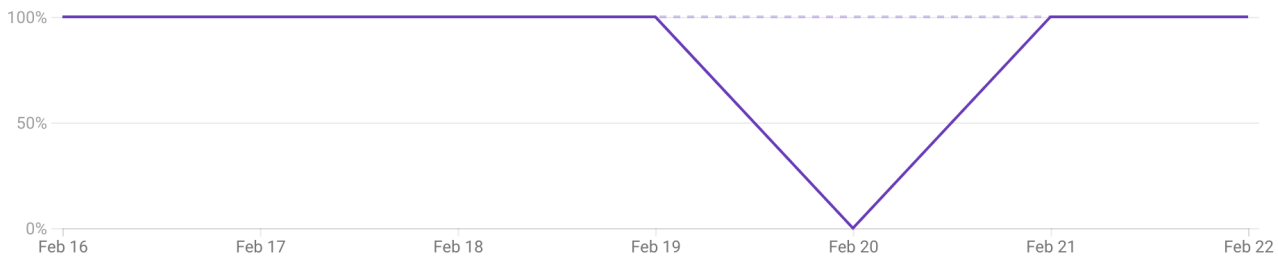
[Link to AdMob](#)

[Link to Google Play](#)

— This week - - Last week

Release & Monitor

Crashlytics | Crash-free users



— This week - - Last week

Admin Panel



Crashlytics

Quizler 2023



New in Crashlytics

Filter

Last 7 days
Feb 14 - Feb 20

Crash-free statistics

Crash-free users

To see this data, make sure your app has
[Google Analytics for Firebase](#) and the latest
[Firebase Crashlytics SDK](#).

Trends

Latest Release

Crashes Users Non-fatals Users ANRs Users

1 1 0 0 0 0



Issues

Search by user ID

Filter issues

Issue state = "Open"

Search issue title, subtitle or keys



Issues

Versions

Events ↓

Users

Crash | edu.mines.csci448.examples.quizlercompose.presentation.question | QuestionScreen.kt:149 | Fresh issue



QuestionScreenKt\$QuestionScreen\$2\$6.invoke

1.0 - 1.0

1

1

java.lang.RuntimeException - Test Crash

Bug Details

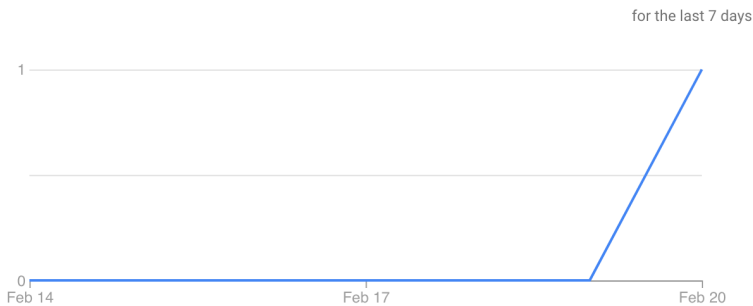


This issue has **1 crash event** affecting **1 user**

Total events by version

1.0 (1)

1



Devices

100% Google

Operating systems

100% Android 13

Device states

0% background

100% Google →

Events



Event summary

1.0 (1)

13

sdk_gphone64_arm64

Feb 20, 2023, 2:39:02 PM

Stack trace

Keys

Logs

Data



TXT



Fatal Exception: java.lang.RuntimeException

Test Crash



```
edu.mines.csci448.examples.quizlercompose.presentation.question.QuestionScreenKt$QuestionScreen$2$6.invoke (QuestionScreen.kt:149)
edu.mines.csci448.examples.quizlercompose.presentation.question.QuestionScreenKt$QuestionScreen$2$6.invoke (QuestionScreen.kt:148)
androidx.compose.foundation.ClickableKt$clickable$4$gesture$1$1$2.invoke-k-4lQ0M (Clickable.kt:167)
androidx.compose.foundation.ClickableKt$clickable$4$gesture$1$1$2.invoke (Clickable.kt:156)
androidx.compose.foundation.gestures.TapGestureDetectorKt$detectTapAndPress$2$1.invokeSuspend (TapGestureDetector.kt:255)
kotlin.coroutines.jvm.internal.BaseContinuationImpl.resumeWith (ContinuationImpl.kt:33)
```

Pro-Tip



- Add to your final project apps now
 - As you test, you'll have a running bug log for any items that need to be fixed
 - As users test, you'll get bug reports for any crashes that occur
 - Gives device information
 - Stack Trace, File, and Line Number

On Tap For Today



- Accessibility
- Bug Reports

To Do For Next Time



- Lab04 due Thu Feb 23
- Lab05 due Tue Feb 28
- Exam 1 due Fri Mar 03 (details Friday)
- Lab06 due Fri Mar 03
- Lab07 due Fri Mar 10
- Alpha Release due Mon Mar 13
- A2 due Tue Mar 14
- Lab08 due Fri Mar 17
- Alpha Feedback due Fri Mar 17
- Spring Break !!!