

Git, Android Studio, and Beyond

How an open source tool integrates with an open
source platform

A Brief History of Open Source

- Linux
- Git
- The Cathedral and The Bazaar
- The spread of open source
- Android sits on Linux

The Cathedral and the Bazaar

- Differentiated Open Source from Free Software
- Inspired Netscape to create Mozilla project, which eventually lead to Firefox
- https://en.wikipedia.org/wiki/The_Cathedral_and_the_Bazaar
- <http://www.catb.org/~esr/writings/cathedral-bazaar/cathedral-bazaar/>
- Enough eyeballs tame complexity

My original intention for this presentation

- Android Studio app development
- Too big of a topic
- Started learning about Git, which I had never heard of
- Fit in with my interest about Open Source
- Much narrower topic, and still ties into Android Studio

Where did Linux come from

- Unix
- Linus Torvalds
- Open Source development
- Took off
- A multitude of versions
- On a multitude of platforms

The need for Git

- Former VCS Bitkeeper, proprietary system
- Need for a new VCS with better performance and right functionality
- Developed in 2005
- Many possible origins of the name Git
- About a month to really get up and running and performing the way intended

English
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 Edit links

Releases [\[edit \]](#)

Version	Original release date ^{[<i>citation needed</i>]}	Latest version	Release date ^{[<i>citation needed</i>]}
0.99	2005-07-11	0.99.9n	2005-12-15
1.0	2005-12-21	1.0.13	2006-01-27
1.1	2006-01-08	1.1.6	2006-01-30
1.2	2006-02-12	1.2.6	2006-04-08
1.3	2006-04-18	1.3.3	2006-05-16
1.4	2006-06-10	1.4.4.5	2008-07-16
1.5	2007-02-14	1.5.6.6	2008-12-17
1.6	2008-08-17	1.6.6.3	2010-12-15
1.7	2010-02-13	1.7.12.4	2012-10-17
1.8	2012-10-21	1.8.5.6	2014-12-17
1.9	2014-02-14	1.9.5	2014-12-17
2.0	2014-05-28	2.0.5	2014-12-17
2.1	2014-08-16	2.1.4	2014-12-17
2.2	2014-11-26	2.2.3	2015-09-04
2.3	2015-02-05	2.3.10	2015-09-29
2.4	2015-04-30	2.4.12	2017-05-05
2.5	2015-07-27	2.5.6	2017-05-05
2.6	2015-09-28	2.6.7	2017-05-05
2.7	2015-10-04	2.7.5	2017-05-05
2.8	2016-03-28	2.8.5	2017-05-05
2.9	2016-06-13	2.9.4	2017-05-05
2.10	2016-09-02	2.10.3	2017-05-05
2.11	2016-11-29	2.11.2	2017-05-05
2.12	2017-02-24	2.12.3	2017-05-05
2.13	2017-05-10	2.13.4	2017-08-01
2.14	2017-08-04	2.14	2017-08-04
Legend: ■ Old version ■ Older version, still supported ■ Latest version ■ Latest preview version			

Basic Git commands

- `git add`
- `git commit`
- `git push`
- `git pull`
- `git log`
- `git status`

Git web site and demo

- Home for git -- <https://git-scm.com/>
- Tutorial to try git and learn basics -- <https://try.github.io/levels/1/challenges/1>

1.7 · Adding All Changes

Great! You also can use wildcards if you want to add many files of the same type. Notice that I've added a bunch of .txt files into your directory below.

I put some in a directory named "octofamily" and some others ended up in the root of our "octobox" directory. Luckily, we can add all the new files using a wildcard with **git add**. Don't forget the quotes!

→ `git add '*.txt'`



```
TryGit—1300x310

# Changes to be committed:
#   (use "git rm --cached <file>..." to unstage)
#
#       new file:   octocat.txt
#
Success!

$ git commit -m "Add cute octocat story"

[master (root-commit) 20b5ccd] Add cute octocat story
1 file changed, 1 insertion(+)
create mode 100644 octocat.txt

Success!
```

1.7 · Adding All Changes

Great! You also can use wildcards if you want to add many files of the same type. Notice that I've added a bunch of .txt files into your directory below.

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→ **git add '*.txt'**



```
TryGit—1300x310

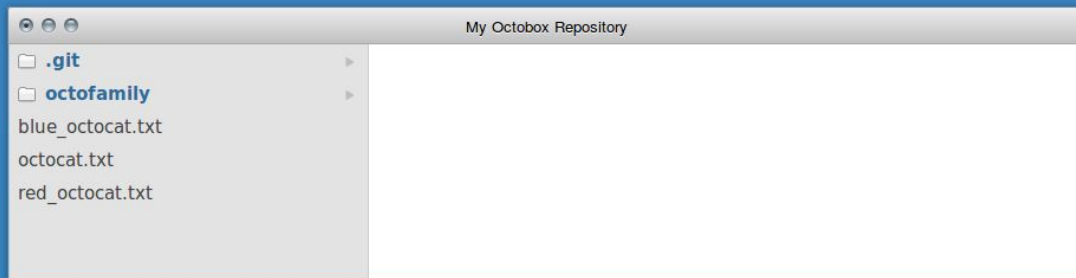
# Changes to be committed:
#   (use "git rm --cached <file>..." to unstage)
#
#       new file:   octocat.txt
#
Success!

$ git commit -m "Add cute octocat story"

[master (root-commit) 20b5ccd] Add cute octocat story
 1 file changed, 1 insertion(+)
 create mode 100644 octocat.txt

Success!

$
```



Advice



Wildcards:

We need quotes so that Git will receive the wildcard before our shell can interfere with it. Without quotes our shell will only execute the wildcard search within the current directory. Git will receive the list of files the shell found instead of the wildcard and it will not be able to add the files inside of the octofamily directory.

More git training resources

- https://try.github.io/wrap_up
- <https://help.github.com/>
- <https://services.github.com/customized-training>
- <http://gitimmersion.com/>
- <http://rogerdudler.github.io/git-guide/>
-

Linus Torvalds talks about Linux and Git

- Youtube TED talk -- <https://www.youtube.com/watch?v=Vo9KPk-ggKk>
- 20 minute talk where Linus Torvalds talks about his work, open source, Linux, git, and what makes him good at what he does

Some Linux numbers and facts

- 50 Core developers
- Roughly 1,000 contributors to each release
- Linux design tried initially to mimic Unix
- Git much more of a design from scratch
- Linux has a single kernel that runs on a multitude of processors -- from mobile devices to supercomputers

Mirror of Git project on Github

- A mirror of Git project, can't update it
- Cool from a historical perspective
- Very first commit (git doing a repository of it's own development) --
<https://github.com/git/git/commits/master?after=20fed7cad40ed0b96232feb828129e3a2ee9860d+48804>
- April 7, 2005
- 10 years of Git interview with Torvalds --
<https://www.linuxfoundation.org/blog/10-years-of-git-an-interview-with-git-creator-linus-torvalds/>
-

Linux irony

- Linus Torvalds was trying to optimize Linux as a desktop operating system
- Even with the huge number and variety of distributions, it's never quite taken off in the desktop market
- However, other than the gaming platform market and desktops, linux dominates on most other computer platforms

Market share by category [\[edit \]](#)



This section needs to be **updated**. Please update this article to reflect recent events or newly available information. *(January 2017)*

Category	Source	Date	Linux	Unix and Unix-like (not incl. Linux)	Windows	In-house	Other
Desktop, laptop (excluding Android and Chrome OS)	Net Applications ^[219]	August 2017	3.37% (Ubuntu, etc.)	5.94% (macOS)	90.7% (10, 8.1, 7)		
Smartphone, tablet	StatCounter Global Stats ^[220]	July 2017	70.27% (Android)	22.47% (iOS)	0.81% (Windows 10 Mobile, Windows Phone 8.1 and older)		6.43%
Server (web)	W3Techs ^[221]	Apr 2017	66.6–37% (of the known-for-sure lower bound of Linux share: Ubuntu 35.8%, Debian 31.9%, CentOS 20.6%, Red Hat (RHEL) 3.3%, Gentoo 2.7%, Fedora 0.9%)	<p>≤. 1% (BSD; Unix-like could be up to 30.18%, then "Unknown" needs to be known to be not Linux)</p> <p>66.6% Unix-like share is mostly Linux; the "Unknown" part, there-of 43.1%, is assumed to be also Linux (for upper bound of that column), could be some non-Linux or e.g. any of the named Linux distributions in the Linux column.</p>	33.5% (Windows Server 2016, W2K12, W2K8)		
Supercomputer	TOP500	June 2017	99.88% (Custom)	0.12% (IBM AIX)			
Mainframe	Gartner ^[213]	Dec 2008	28% (SLES, RHEL)	72% (z/OS) UNIX System Services			
Video game consoles (7th & 8th generation only)	VGChartz ^[222]	Aug 2017		35% (PS4, PS3, Vita, PSP)	16.69% (Xbox One, Xbox 360)	48.30% (Switch, Wii U, Wii, 3DS, DS)	0%
Embedded	UBM Electronics ^[223]	Mar 2012	29.44% (Android plus other non-Android Linux)	4.29% (QNX)	11.65% (WCE 7)	13.5% ("Inhouse/custom" is most popular, single choice)	41.1%

Note



Learn Git in your browser for free with [Try Git](#).



About

The advantages of Git compared to other source control systems.



Documentation

Command reference pages, Pro Git book content, videos and other material.



Downloads

GUI clients and binary releases for all major platforms.



Community

Get involved! Bug reporting, mailing list, chat, development and more.



Pro Git by Scott Chacon and Ben Straub is available to [read online for free](#). Dead tree versions are available on [Amazon.com](#).



[Linux GUIs](#)



[Tarballs](#)



[Mac Build](#)



[Source Code](#)

Companies & Projects Using Git

Google

facebook

Microsoft

twitter

Linked in

NETFLIX



PostgreSQL



This open sourced site is hosted on GitHub.
Patches, suggestions and comments are welcome.

Git is a member of Software Freedom Conservancy

```
matt (master) GitAndMore $ git help
usage: git [--version] [--help] [-C <path>] [-c name=value]
           [--exec-path[=<path>]] [--html-path] [--man-path] [--info-path]
           [-p | --paginate | --no-pager] [--no-replace-objects] [--bare]
           [--git-dir=<path>] [--work-tree=<path>] [--namespace=<name>]
           <command> [<args>]

These are common Git commands used in various situations:

start a working area (see also: git help tutorial)
  clone      Clone a repository into a new directory
  init       Create an empty Git repository or reinitialize an existing one

work on the current change (see also: git help everyday)
  add        Add file contents to the index
  mv         Move or rename a file, a directory, or a symlink
  reset      Reset current HEAD to the specified state
  rm         Remove files from the working tree and from the index

examine the history and state (see also: git help revisions)
  bisect     Use binary search to find the commit that introduced a bug
  grep       Print lines matching a pattern
  log        Show commit logs
  show       Show various types of objects
  status     Show the working tree status

grow, mark and tweak your common history
  branch     List, create, or delete branches
  checkout   Switch branches or restore working tree files
  commit     Record changes to the repository
  diff       Show changes between commits, commit and working tree, etc
  merge      Join two or more development histories together
  rebase     Forward-port local commits to the updated upstream head
  tag        Create, list, delete or verify a tag object signed with GPG

collaborate (see also: git help workflows)
  fetch      Download objects and refs from another repository
  pull       Fetch from and integrate with another repository or a local branch
  push       Update remote refs along with associated objects

'git help -a' and 'git help -g' list available subcommands and some
concept guides. See 'git help <command>' or 'git help <concept>'
to read about a specific subcommand or concept.
matt (master) GitAndMore $
```

```
File Edit View Search Terminal Help
available git commands in '/usr/lib/git-core'

add
add--interactive
am
annotate
apply
archive
bisect
bisect--helper
blame
branch
bundle
cat-file
check-attr
check-ignore
check-mailmap
check-ref-format
checkout
checkout-index
cherry
cherry-pick
citool
clean
clone
column
commit
commit-tree
config
count-objects
credential
credential-cache
credential-cache--daemon
credential-store
daemon
describe
diff
diff-files
diff-index
diff-tree
difftool
difftool--helper
fast-export
fast-import
fetch
fetch-pack
filter-branch
fmt-merge-msg
for-each-ref
format-patch
fsck
fsck-objects
gc
get-tar-commit-id
grep
gui
gui--askpass
hash-object
help
http-backend
http-fetch
http-push
imap-send
index-pack
init
init-db
merge-octopus
merge-one-file
merge-ours
merge-recursive
merge-resolve
merge-subtree
merge-tree
mergetool
mktag
mktree
mv
name-rev
notes
pack-objects
pack-redundant
pack-refs
patch-id
prune
prune-packed
pull
push
quiltimport
read-tree
rebase
receive-pack
reflog
relink
remote
remote-ext
remote-fd
remote-ftp
remote-ftp
remote-http
remote-https
remote-testsvn
repack
replace
request-pull
rerere
reset
rev-list
rev-parse
revert
rm
send-pack
sh-i18n--envsubst
shell
shortlog
show
show-branch
show-index
show-ref
stage
stash
status
strip-space
submodule
submodule--helper
subtree
symbolic-ref
tag
unpack-file
unpack-objects
update-index
```

Basic Git concepts

- Repository
- Branch
- Fork
- Pull request
- Merge

```
Terminal
File Edit View Search Terminal Help
new file:   GitInit.png
new file:   GitStatus.png
```

Untracked files:
(use "git add <file>..

Screenshot from

```
matt (master +) GitAndMo
matt (master +) GitAndMo
On branch master
```

Initial commit

Changes to be committed:
(use "git rm --cached

```
new file:   Crea
new file:   GitA
new file:   GitI
new file:   GitS
```

```
matt (master +) GitAndMo
```

```
~/version-control/GitAndMore/.git/COMMIT_EDITMSG - Sublime Text (UNREGISTER... - + x
File Edit Selection Find View Goto Tools Project Preferences Help
```

```
COMMIT_EDITMSG
1 Initial Commit
2 # Please enter the commit message for your changes. Lines
  starting
3 # with '#' will be ignored, and an empty message aborts the
  commit.
4 # On branch master
5 #
6 # Initial commit
7 #
8 # Changes to be committed:
9 #   new file:   CreateDirectory.png
10 #   new file:   GitAdds.png
11 #   new file:   GitInit.png
12 #   new file:   GitStatus.png
13 #
14 # Untracked files:
15 #   GitCommit.png
16 #
17
```

Line 1, Column 15

Tab Size: 4

Plain Text

Logs



This repository

Search

Pull requests

Issues

Marketplace

Explore

+ ▾

MattBroihier / GitAndMore

Watch ▾ 0

Star 0

Fork 0

Code

Issues 0

Pull requests 0

Projects 0

Wiki

Settings

Insights ▾

No description, website, or topics provided.

Edit

[Add topics](#)

2 commits

1 branch

0 releases

1 contributor

Branch: master ▾

New pull request

Create new file

Upload files

Find file

Clone or download ▾



MattBroihier Add 2 new screen prints

Latest commit 3a7d464 21 minutes ago

CreateDirectory.png

Initial Commit

an hour ago

EditCommitMessage.png

Add 2 new screen prints

21 minutes ago

GitAdds.png

Initial Commit

an hour ago

GitCommit.png

Add 2 new screen prints

21 minutes ago

GitInit.png

Initial Commit

an hour ago

GitStatus.png

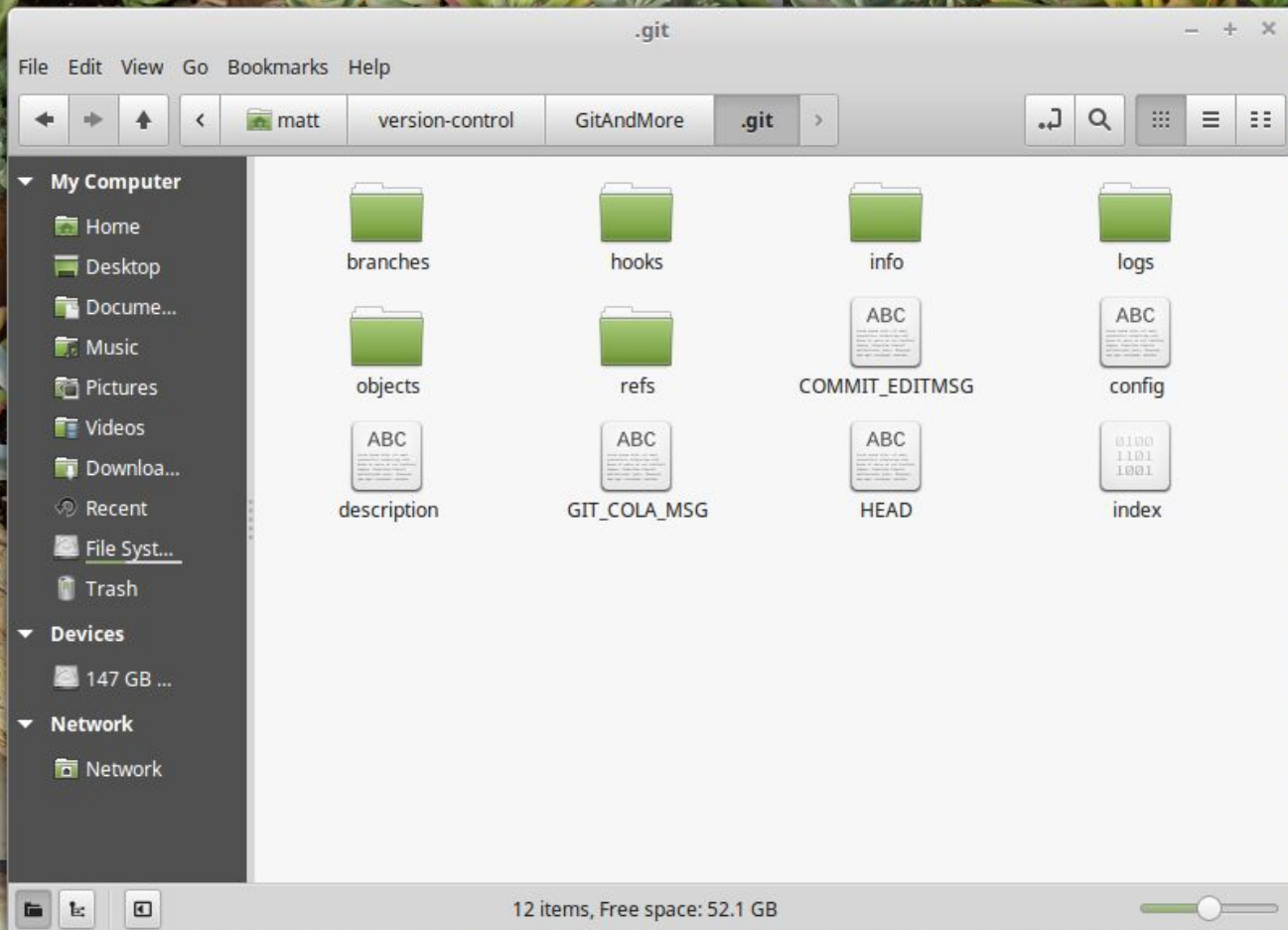
Initial Commit

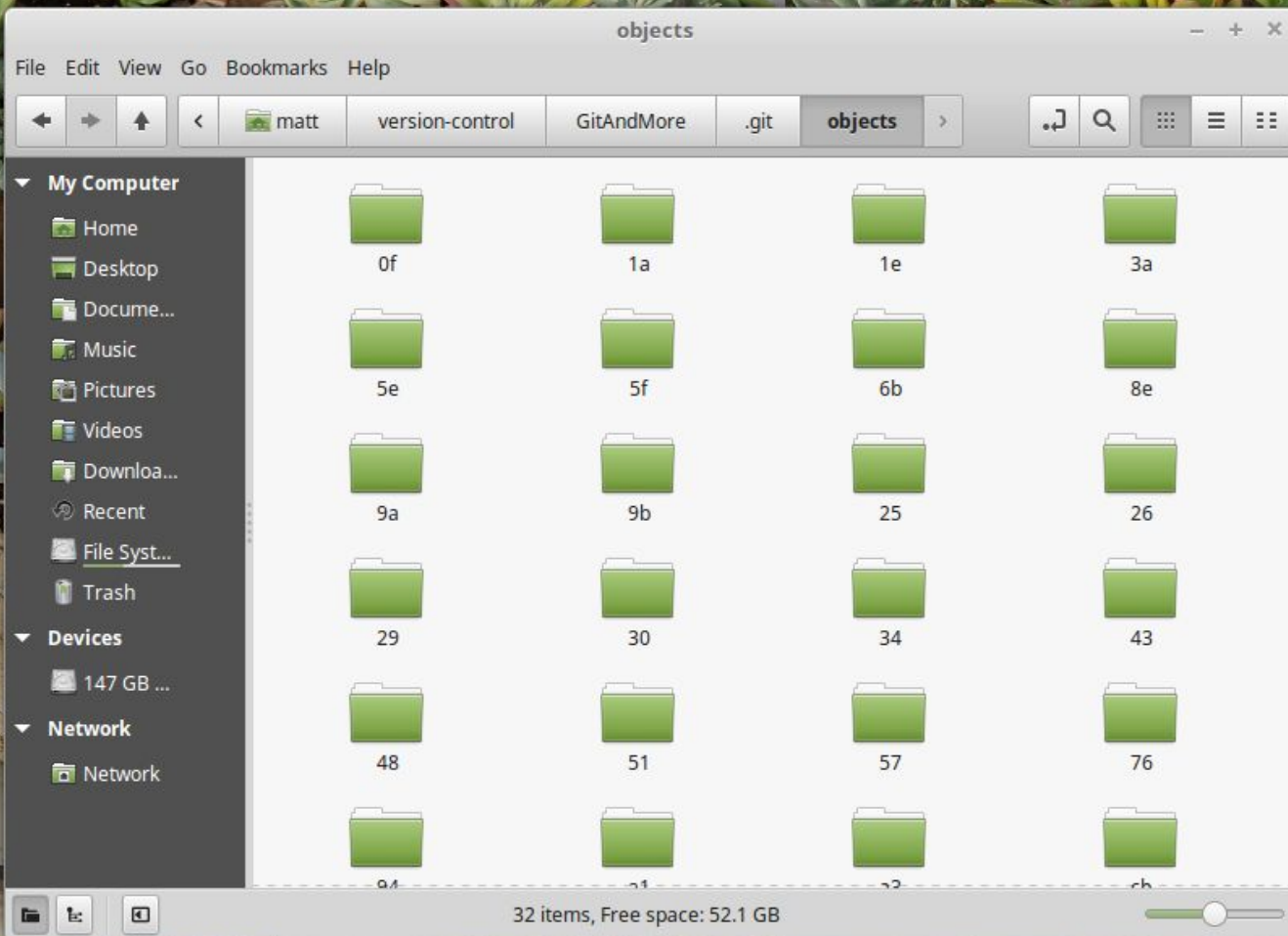
an hour ago

Help people interested in this repository understand your project by adding a README.

Add a README







View

Log

1000

Graph

Summary	Author	Date, Time
playing with colors a bit	Matt	Wed Sep 27 16:31:32 2017 ...
merge	zhangzhikai	Mon Aug 22 10:20:37 2016 +...
fix the format problem	zhikaizhang	Fri Jul 29 23:59:28 2016 +0800
memorize the playerColor and difficulty of last choice	zhangzhikai	Mon Aug 22 10:07:47 2016 +...
update README	zhangzhikai	Fri Jul 29 23:40:38 2016 +0800
v1.0.0	zhangzhikai	Thu Jul 28 20:15:30 2016 +0...

Diff

zhangzhikai <zhangzhikai@seu.edu.cn>
memorize the playerColor and difficulty of last choice
d0857945213a0add8971646c8a46bd995c603776

```
diff --git a/.idea/misc.xml b/.idea/misc.xml
index 7158618..cca2cda 100644
--- a/.idea/misc.xml
+++ b/.idea/misc.xml
@@ -37,7 +37,7 @@
<ConfirmationsSetting value="0" id="Add" />
<ConfirmationsSetting value="0" id="Remove" />
</component>
- <component name="ProjectRootManager" version="2" languageLevel="JDK_1_7" default="true" assert-keyword="true" jdk-15="true" pro
+ <component name="ProjectRootManager" version="2" languageLevel="JDK_1_8" default="true" assert-keyword="true" jdk-15="true" pro
  <output url="file://$PROJECT_DIR$/build/classes" />
</component>
<component name="ProjectType">
diff --git a/app/src/main/java/cn/zhikaizhang/activity/GameActivity.java b/app/src/main/java/cn/zhikaizhang/activity/GameActivity.java
index 69f420b..f964fce 100644
--- a/app/src/main/java/cn/zhikaizhang/activity/GameActivity.java
+++ b/app/src/main/java/cn/zhikaizhang/activity/GameActivity.java
@@ -2,9 +2,11 @@ package cn.zhikaizhang.activity;

import android.app.Activity;
import android.content.Intent;
+import android.content.SharedPreferences;
import android.os.Bundle;
import android.os.Handler;
import android.os.Message;
+import android.preference.PreferenceManager;
import android.view.KeyEvent;
import android.view.MotionEvent;
import android.view.View;
@@ -30,125 +32,131 @@ import cn.zhikaizhang.game.ReversiView;

public class GameActivity extends Activity {
```

Files

Filename	Additions	Deletions
.idea/misc.xml	1	1
app/src/main/java/cn/zhikaizhang/activity/GameActivity.java	241	229
app/src/main/java/cn/zhikaizhang/activity/MainActivity.java	8	2
app/src/main/java/cn/zhikaizhang/widget/NewGameDialog.java	10	3
app/src/main/res/layout/new_game_dialog.xml	1	0

25 facts about Linux on it's 25th birthday

<https://medium.freecodecamp.org/linux-is-25-yay-lets-celebrate-with-25-rad-facts-about-linux-c8d8ac30076d>

What is a pull request?



The image is a screenshot of a GitHub 'Advice' box. It has a blue background and a dark grey header bar at the top. On the left side of the header bar is a small white icon. The word 'Advice' is centered in the header bar in white text. Below the header bar, on the right side, is a cartoon illustration of the GitHub Octocat mascot holding a red heart. The main content area has a light blue background. The title 'Pull Requests' is in bold. The text explains that if you're hosting your repo on GitHub, you can do something called a pull request. It then describes a pull request as a way for the boss of the project to look through your changes and make comments before deciding to merge in the change. It notes that this is a really great feature used all the time for remote workers and open-source projects. Finally, it says to check out the pull request help page for more information.

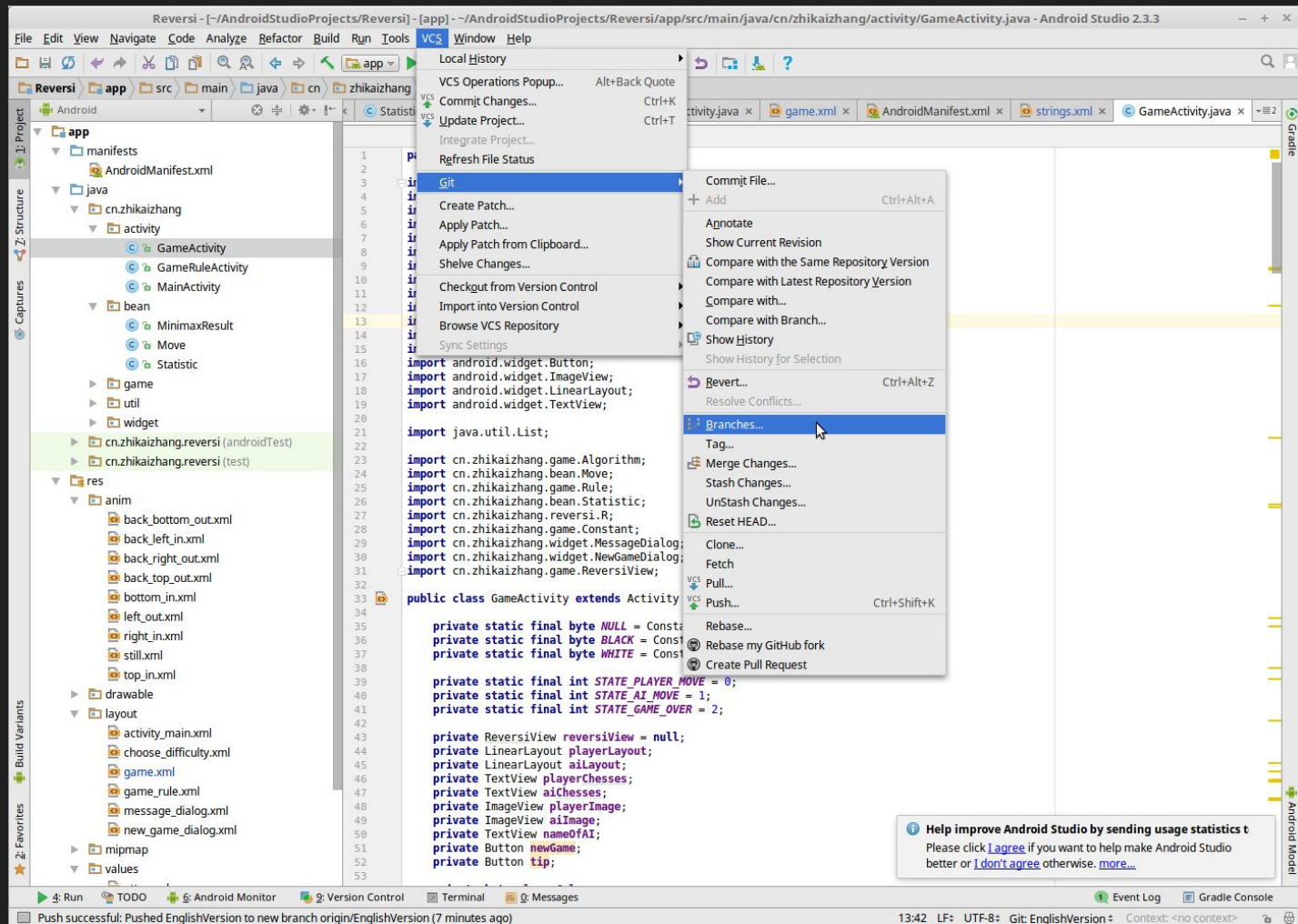
Advice

Pull Requests

If you're hosting your repo on GitHub, you can do something called a pull request.

A pull request allows the boss of the project to look through your changes and make comments before deciding to merge in the change. It's a really great feature that is used all the time for remote workers and open-source projects.

Check out the [pull request help page](#) for more information.



Reversi [-/AndroidStudioProjects/Reversi] - [app] -- ~/AndroidStudioProjects/Reversi/app/src/main/java/cn/zhikaizhang/activity/GameActivity.java - Android Studio 2.3.3

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

Reversi app src main java cn zhikaizhang activity MainActivity.java game.xml AndroidManifest.xml strings.xml GameActivity.java

1: Project
2: Structure
3: Captures

Android
app
manifests
AndroidManifest.xml
java
cn.zhikaizhang
activity
GameActivity
GameRuleActivity
MainActivity
bean
MinimaxResult
Move
Statistic
game
util
widget
cn.zhikaizhang.reversi (androidTest)
cn.zhikaizhang.reversi (test)
res
anim
back_bottom_out.xml
back_left_in.xml
back_right_out.xml
back_top_out.xml
bottom_in.xml
left_out.xml

```
1 package cn.zhikaizhang.activity;
2
3 import android.app.Activity;
4 import android.content.Intent;
5 import android.content.SharedPreferences;
6 import android.os.Bundle;
7 import android.os.Handler;
8 import android.os.Message;
9 import android.preference.PreferenceManager;
10 import android.view.KeyEvent;
11 import android.view.MotionEvent;
12 import android.view.View;
13 import android.view.View.OnClickListener;
14 import android.view.View.OnTouchListener;
15 import android.view.Window;
16 import android.widget.Button;
17 import android.widget.ImageView;
18 import android.widget.LinearLayout;
19 import android.widget.TextView;
20
21 import java.util.List;
22
23 import cn.zhikaizhang.game.Algorithm;
24 import cn.zhikaizhang.bean.Move;
25 import cn.zhikaizhang.game.Rule;
26 import cn.zhikaizhang.bean.Statistic;
27 import cn.zhikaizhang.reversi.R;
28 import cn.zhikaizhang.game.Constant;
29 import cn.zhikaizhang.widget.MessageDialog;
30 import cn.zhikaizhang.widget.NewMessageDialog;
31 import cn.zhikaizhang.game.ReversiView;
32
33 public class GameActivity extends Activity {
34     private static final byte MULE = Constant.MULE;
35 }
```

Version Control: Local Changes Log Console

Branch: All User: All Date: All Paths: All

HEAD EnglishVersion origin/EnglishVersion Creating English version
master origin/master playing with colors a bit
merge
memorize the playerColor and difficulty of last choice
fix the format problem
update README
v1.0.0

Commit details

Matt	9/28/17 10:04 AM
Matt	9/27/17 4:31 PM
zhangzhikai	8/21/16 9:20 PM
zhangzhikai	8/21/16 9:07 PM
zhikaizhang*	7/29/16 10:59 AM
zhangzhikai	7/29/16 10:40 AM
zhangzhikai	7/28/16 7:15 AM

4: Run TODO 5: Android Monitor 6: Version Control Terminal 7: Messages

Event Log Gradle Console

Push successful: Pushed EnglishVersion to new branch origin/EnglishVersion (9 minutes ago)

21:23 LF UTF-8 Git: EnglishVersion Context: <no context>

