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

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

https://en.wikipedia.org/wiki/Git

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Edit links

Releases [edit]

Version	Original release date[citation needed]	Latest version	Release date[citation needed]
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

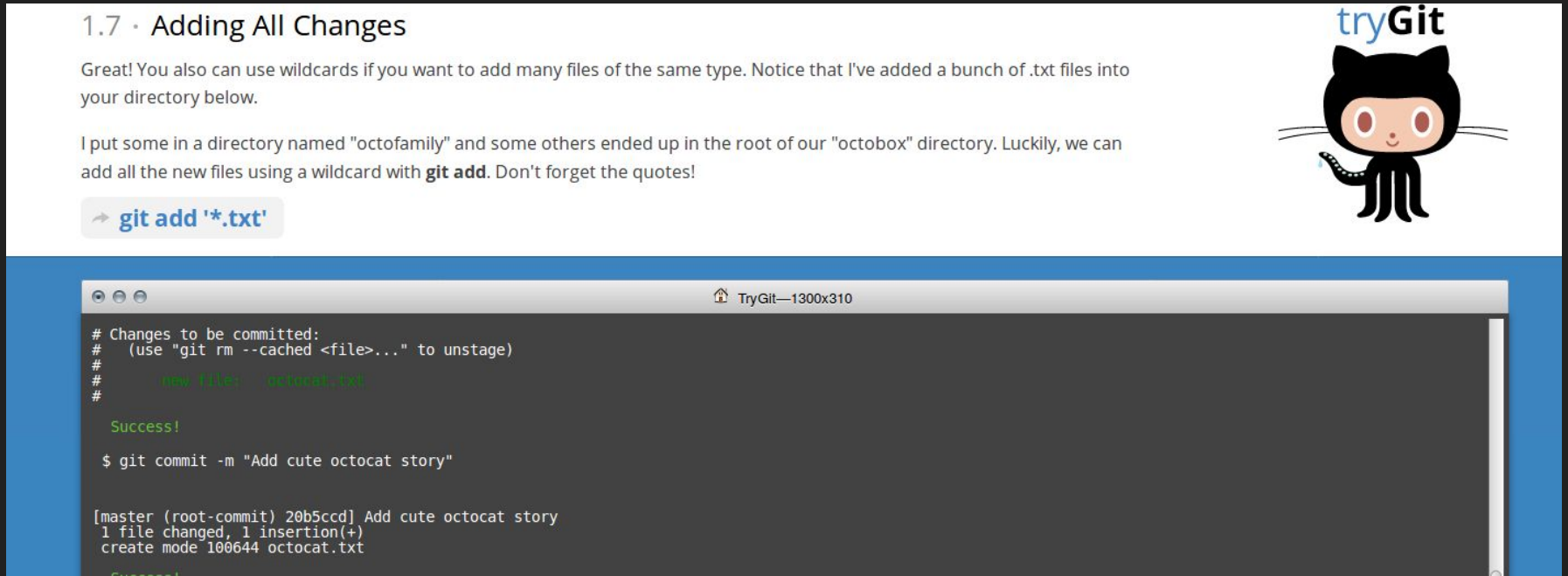
Legend: Old version | Older version, still supported | **Latest version** | Latest preview version

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

tryGit

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!

 $
```

My Octobox Repository

- .git
- octofamily
- blue_octocat.txt
- octocat.txt
- red_octocat.txt

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-gqKk
- 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%)	c. 1% (BSD; Unix-like could be up to 30.18%, then "Unknown" needs to be known to be not Linux) 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.	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 LinkedIn NETFLIX PostgreSQL

android RAILS Qt GNOME eclipse

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 $
```

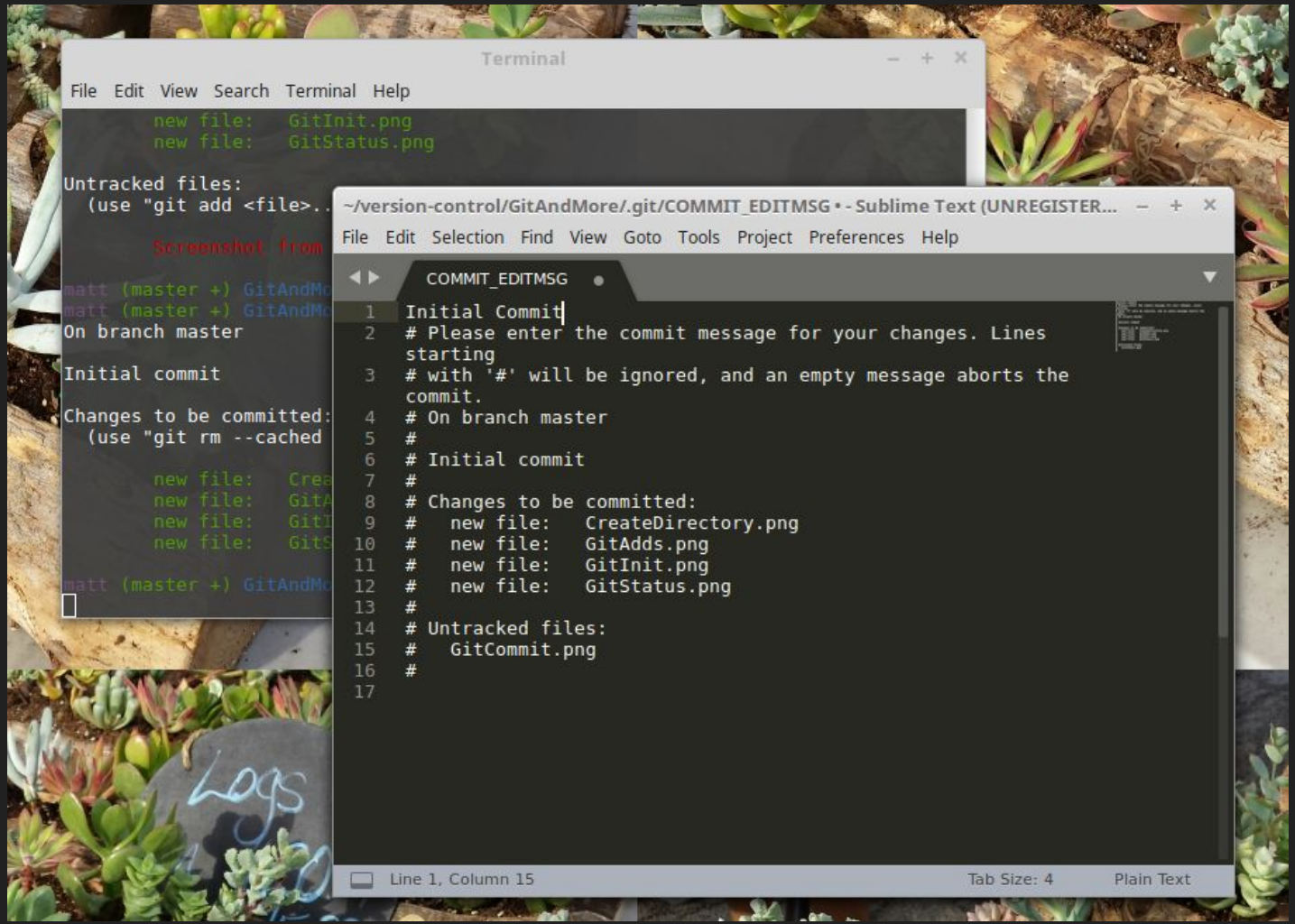
File Edit View Search Terminal Help

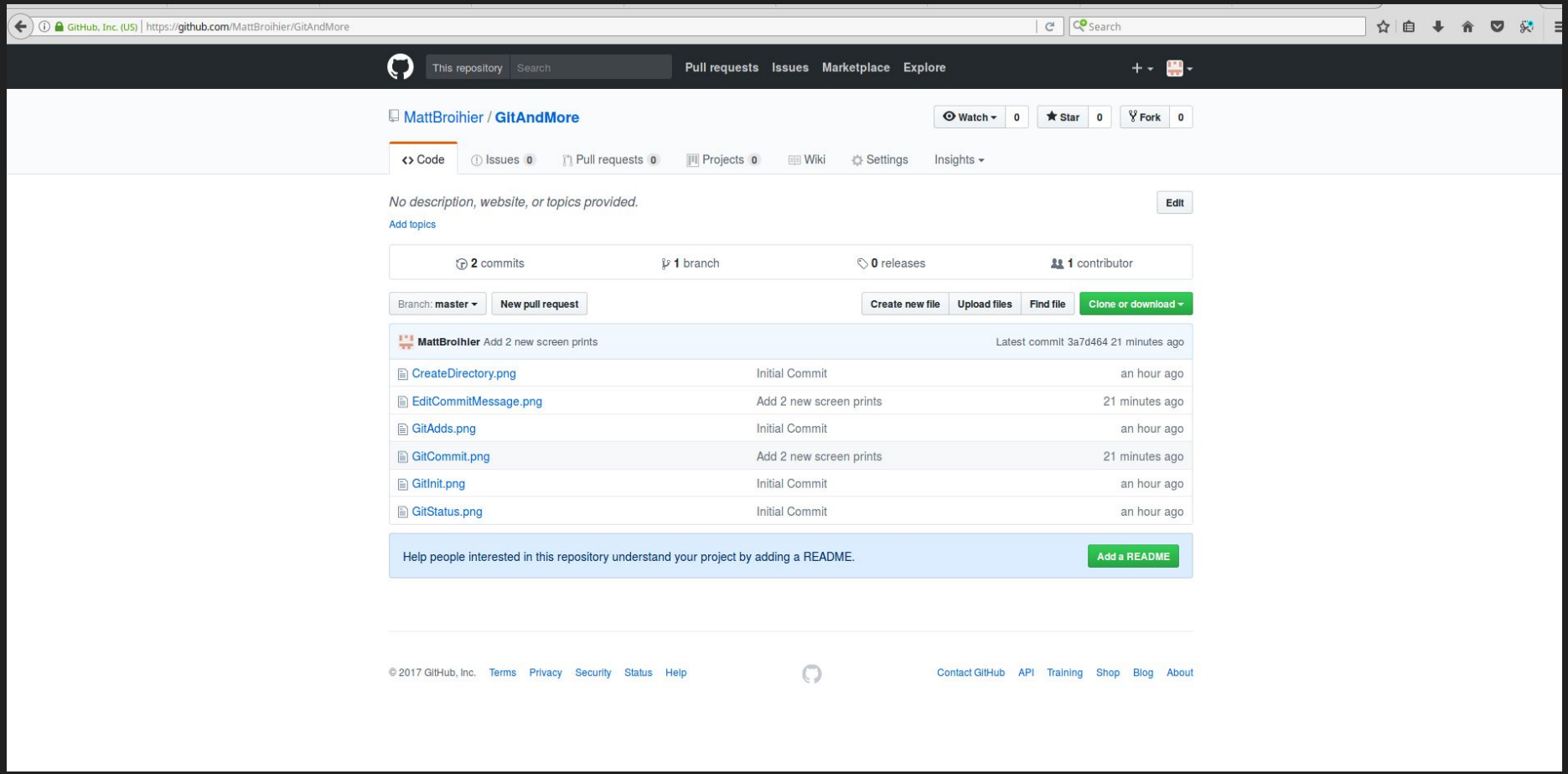
```
available git commands in '/usr/lib/git-core'

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


GitHub, Inc. (US) https://github.com/MattBroihier/GitAndMore
Search
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
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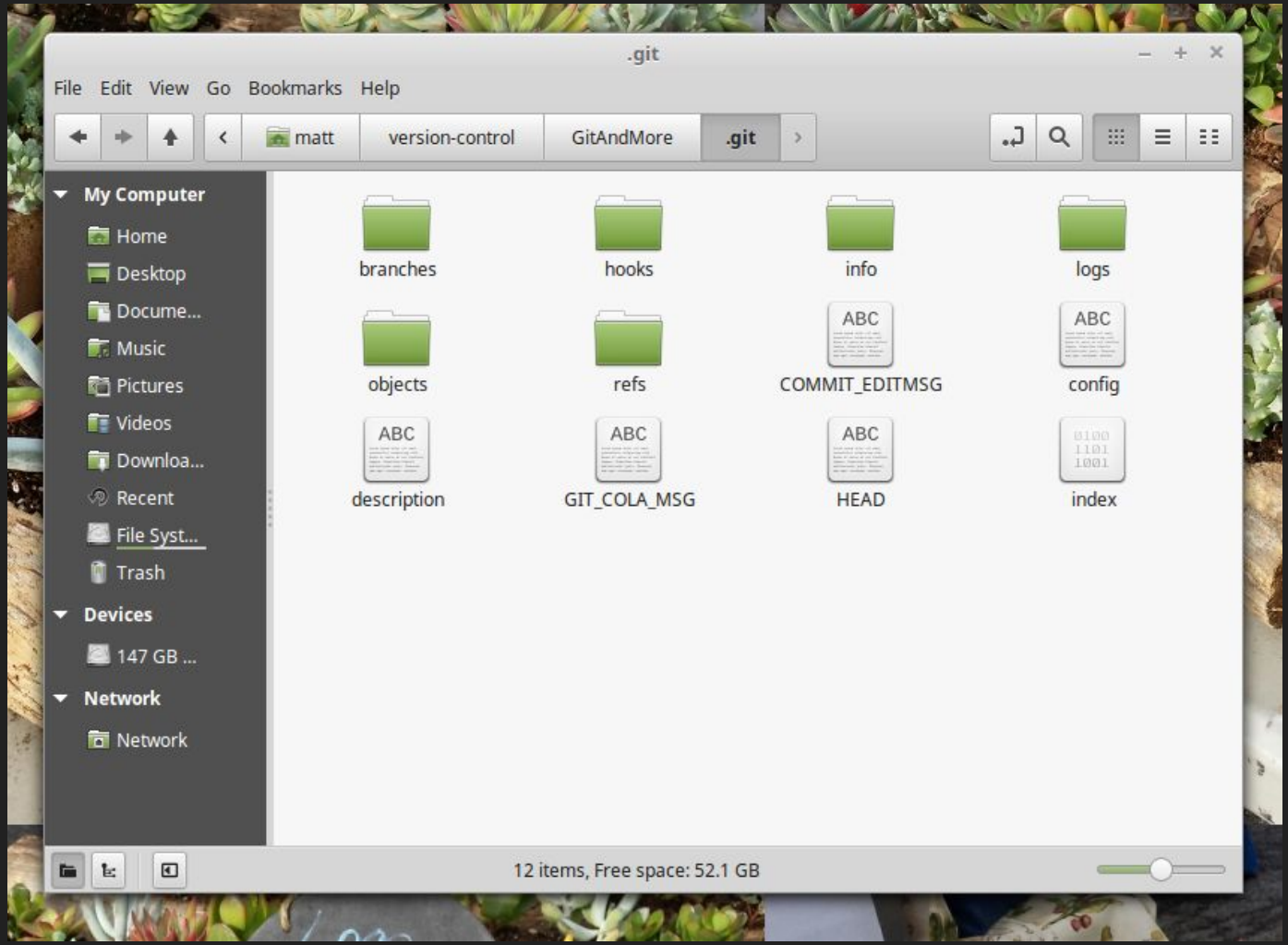
Contact GitHub API Training Shop Blog About


.git
File Edit View Go Bookmarks Help
matt
version-control
GitAndMore
.git
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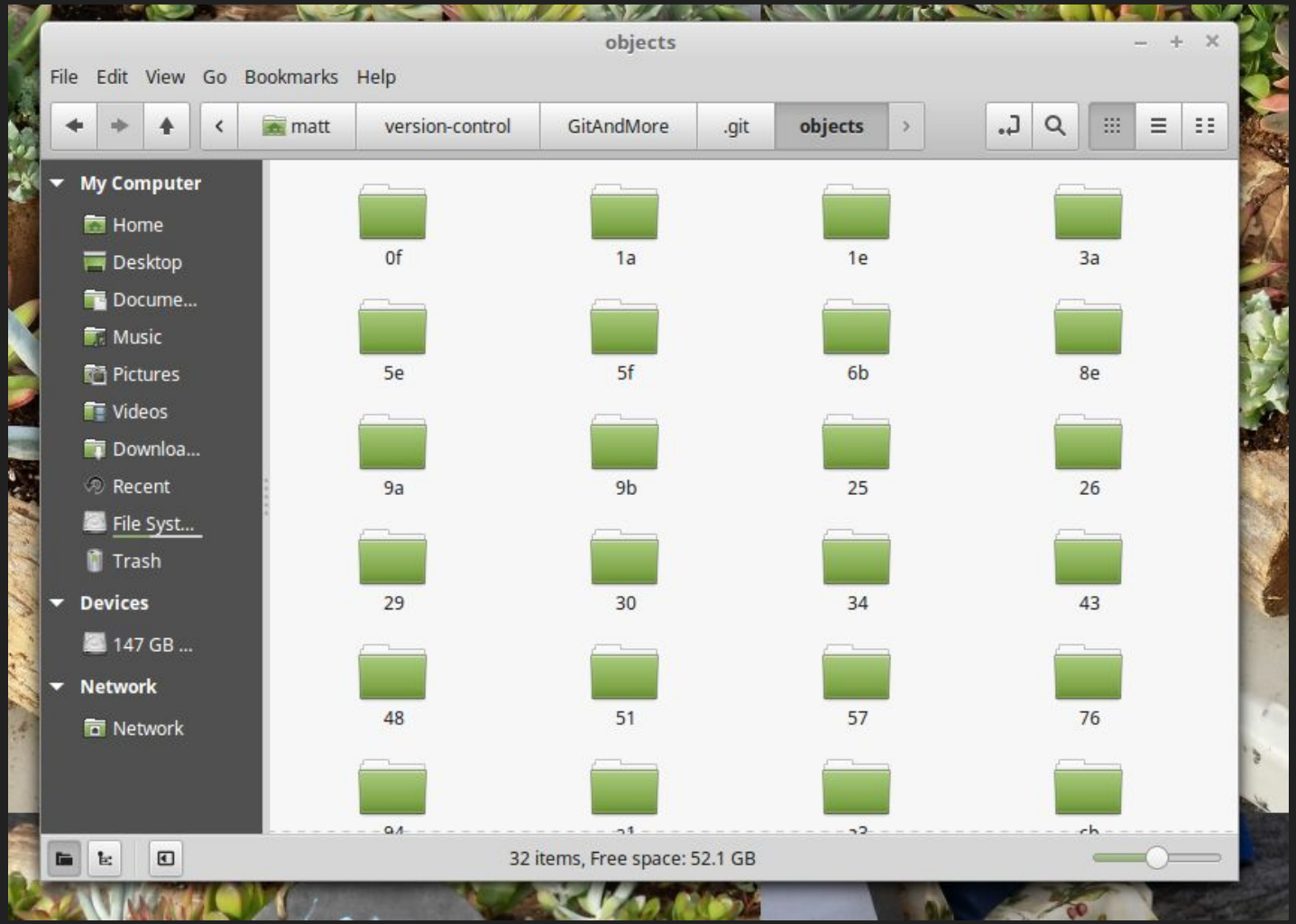
File Syst...
Trash
Devices
147 GB ...
Network
Network
branches
hooks
info
logs
objects
refs
COMMIT_EDITMSG
config
description
GIT_COLA_MSG
HEAD
index
12 items, Free space: 52.1 GB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File Edit View Go Bookmarks Help
matt
version-control
GitAndMore
.git
objects
My Computer
Home
Desktop
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Music
Pictures
Videos
Downloa...
Recent
File Syst...
Trash
Devices
147 GB ...
Network
Network
0f
1a
1e
3a
5e
5f
6b
8e
9a
9b
25
26
29
30
34
43
48
51
57
76
32 items, Free space: 52.1 GB

Reversi - DAG

View

Log 1000

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...

Graph

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

Diff

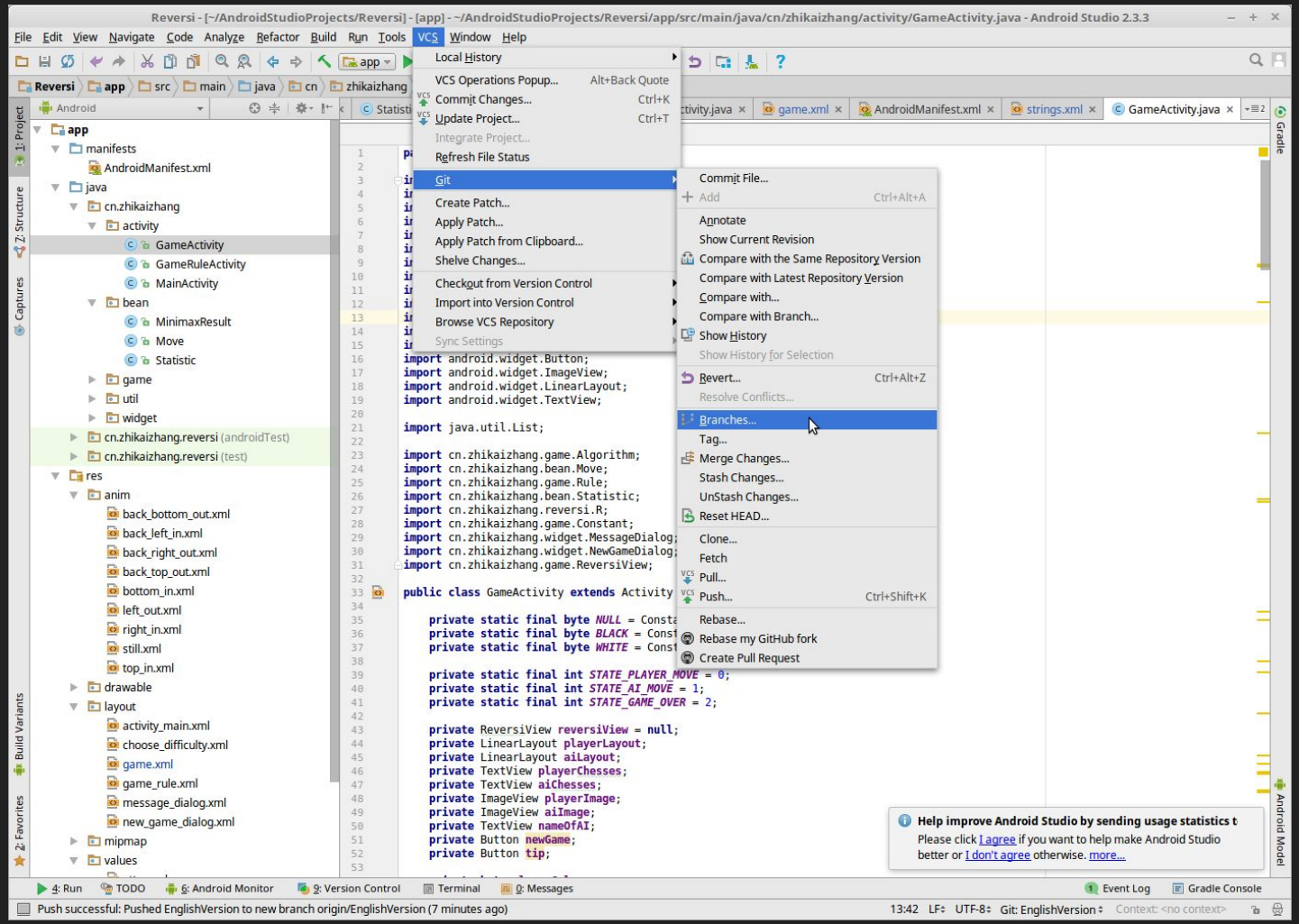
zhangzhikai <zhangzhikai@seu.edu.cn>
memorize the playerColor and difficulty of last choice
d0857945213a0add8971646c8a46bd995c603776

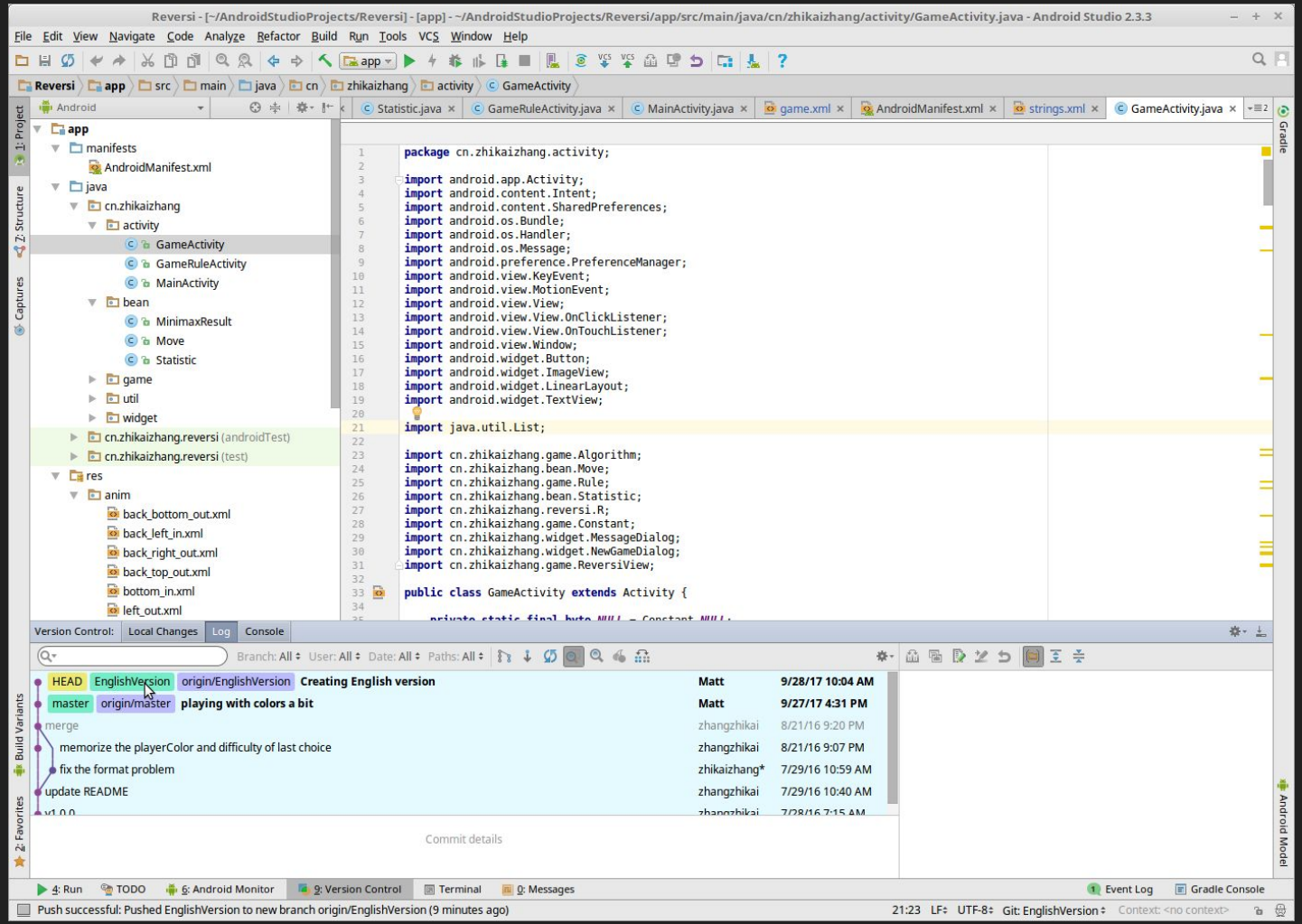
```
diff --git a/.idea/misc.xml b/.idea/misc.xml
index 7158618..cca2cda 100644
--- a/.idea/misc.xml
+++ b/.idea/misc.xml
@@ -37,7 +37,7 @@
     <ConfirmationsSetting value="0" id="Add" />
     <ConfirmationsSetting value="0" id="Remove" />
   </component>
-  <component name="ProjectRootManager" version="2" 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.
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 {
```

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?


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
Local History
VCS Operations Popup... Alt+Back Quote
Commit Changes... Ctrl+K
Update Project... Ctrl+T
Integrate Project...
Refresh File Status
Git
Create Patch...
Apply Patch...
Apply Patch from Clipboard...
Shelve Changes...
Checkout from Version Control
Import into Version Control
Browse VCS Repository
Sync Settings
Commit File...
Add Ctrl+Alt+A
Annotate
Show Current Revision
Compare with the Same Repository Version
Compare with Latest Repository Version
Compare with...
Compare with Branch...
Show History
Show History for Selection
Revert... Ctrl+Alt+Z
Resolve Conflicts...
Branches...
Tag...
Merge Changes...
Stash Changes...
UnStash Changes...
Reset HEAD...
Clone...
Fetch
Pull...
Push... Ctrl+Shift+K
Rebase...
Rebase my GitHub fork
Create Pull Request
Help improve Android Studio by sending usage statistics t
Please click I agree if you want to help make Android Studio better or I don't agree otherwise. more...
Push successful: Pushed EnglishVersion to new branch origin/EnglishVersion (7 minutes ago)


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 GameActivity
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
Statistic.java
GameRuleActivity.java
MainActivity.java
game.xml
AndroidManifest.xml
strings.xml
GameActivity.java
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;
import android.view.View.OnClickListener;
import android.view.View.OnTouchListener;
import android.view.Window;
import android.widget.Button;
import android.widget.ImageView;
import android.widget.LinearLayout;
import android.widget.TextView;
import java.util.List;
import cn.zhikaizhang.game.Algorithm;
import cn.zhikaizhang.bean.Move;
import cn.zhikaizhang.game.Rule;
import cn.zhikaizhang.bean.Statistic;
import cn.zhikaizhang.reversi.R;
import cn.zhikaizhang.game.Constant;
import cn.zhikaizhang.widget.MessageDialog;
import cn.zhikaizhang.widget.NewGameDialog;
import cn.zhikaizhang.game.ReversiView;
public class GameActivity extends Activity {
Version Control:
Local Changes
Log
Console
Branch: All
User: All
Date: All
Paths: All
HEAD EnglishVersion origin/EnglishVersion Creating English version Matt 9/28/17 10:04 AM
master origin/master playing with colors a bit Matt 9/27/17 4:31 PM
merge zhangzhikai 8/21/16 9:20 PM
memorize the playerColor and difficulty of last choice zhangzhikai 8/21/16 9:07 PM
fix the format problem zhikaizhang* 7/29/16 10:59 AM
update README zhangzhikai 7/29/16 10:40 AM
Commit details
4: Run
TODO
6: Android Monitor
9: Version Control
Terminal
0: 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>