

# Contemporary Peer Code Review Practices

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# Can you spot the mistakes?



```
1 // file: IVR.CPP
2 void IVR()
3 {
4     //press 1 for account balance, 2 for last transaction,
5     //3 for last statement, any other for operator
6     play_prompt();
7
8     int key_pressed= get_user_choice();
9     if(key_pressed ==1)
10    {
11        play_account_balance();
12    }
13    else if(key_pressed ==2)
14    {
15        play_last_transaction();
16    }
17    else if(key_pressed ==3)
18    {
19        play_last_statement();
20    }
21    else transfer_to_operator();
22 }
```

Assignment operator  
instead of comparison

```
1 //file: printer.java
2 if (user.isAuthenticated)
3 {
4     userAccess = checkUserAuthorization(user);
5
6     //if user has access to printer
7     if(user.isAuthenticated && userAccess.printer)
8         printUsageReport ();
9     else
10        emailUsageReport ();
11 }
```

Redundant check

```
1 //file: UserStats.java
2 String[] listOfUsers = getUsersList();
3 //print all the users name
4 for(int i=1;i< listOfUsers.length();i++)
5     System.out.println("User# "+i+": "+listOfUsers[i]);
6
```

Will not print first user

Do you think only novice  
developers make those  
mistakes?

```
#define CDMA_SUBSCRIPTION_SOURCE_NV 0  
#define CDMA_SUBSCRIPTION_SOURCE_RUIM 1
```

80  
81  
82

David Turner

Sep 13, 2010

the functions below operate on an AModem object, so should be named amodem\_switch\_technology(),

amodem\_set\_cdma\_XXXX

[Reply ...](#) [Reply 'Done'](#)

Jaime A Lopez-Sollano

Sep 23, 2010

Done

[Reply ...](#) [Reply 'Done'](#)

```
static const char* switchTechnology(AModem modem, AModemTech newtech, int32_t newpreferred);  
static int set_cdma_subscription_source( AModem modem, ACdmaSubscriptionSource ss);  
static int set_cdma_prl_version( AModem modem, int prlVersion);
```

83  
84  
85  
86

```
if (noMedia) {  
    // In case the file is known and now is under a  
    // .nomedia folder mark as not seen in order to  
    // be removed from files table in the post scan.  
    if (entry != null && noMedia) {
```

478  
479  
480  
481  
482

Emilio López

Jan 15, 2012

Isn't '&& noMedia' redundant? noMedia can only be true inside the if block.

[Reply ...](#) [Reply 'Done'](#)

David Marques

Jan 16, 2012

Thanks Emilio! My bad :D

[Reply ...](#) [Reply 'Done'](#)

```
        entry.mSeenInFileSystem = false;  
    }  
    return null;  
}
```

483  
484  
485  
486  
487

#13244

```
if ((nbytes=recvfrom(fd,msgbuf,MSGBUFSIZE,0,  
                     >>                                (struct sockaddr *)&addr,  
63 >>                         perror("recvfrom");  
64 >>                         exit(1);  
65 >>                     }  
66 >>                     puts(msgbuf);
```

~~Review Status~~

Feb 8, 2010

Isn't there a risk of msgbuf not being terminated? Reading all the way to MSGBUFSIZE seems to risk overwriting the implicit init done, or does the kernel always null-terminate the buffer, even if it is larger than MSGBUFSIZE?

I guess the worst case scenario is puts going off on a tangent, so probably not particularly dangerous, but still?

[Reply](#)

[Done](#)

~~Review Status~~

Feb 9, 2010

You are absolutely right I will change it to write() the number of bytes received. I only tested it with the other file (sender.c) which sends "Hello, world" with the null-byte attached. I will send a patch when I get home. Thanks for the review!

```
54 »      »      if ( $this->isPermalink ) {  
55 »      »      »      »      $html .= Linker::link(  
56 »      »      »      »      »      SpecialPage::getTitleFor( 'ArticleFeedbackv5', $record[0]->  
age_title ),  
57 »      »      »      »      »      wfMessage( 'articlefeedbackv5-special-goback' )->text())
```

Catrophe

Apr 17, 2012

And this unfixes a security bug that was fixed earlier: this must be `->escaped()`, not `->text()`, because the second param to `link()` is HTML.

[Reply ...](#) [Reply 'Done'](#)

Reha Sterbin

Apr 17, 2012

Done

[Reply ...](#) [Reply 'Done'](#)

**TO ERR IS HUMAN**

You might be an Internet 'solopreneur', a lone wolf who writes, edits, formats, checks and publishes your own content. Or you might work for a ~~company~~ website, either as a content creator or as a ~~production~~ editor, sub-editor or editor - the person in charge of quality control and tasked to edit/proofread ~~work~~ produced by your colleagues.

Not you? Maybe you want to self-publish a book on Amazon, check through a student essay or thesis, perhaps error-check a company report? Maybe you're involved in creating a brochure, newsletters, business cards, product packaging or signs? Not you either? What about sending an email, posting a Tweet or updating Facebook? They all involve words. Is everything you've typed recently correct? Are you certain?

It's not always easy to spot errors.

You might not have a proofreading process. Or you might be already be actively proofreading and want to get better at it.

If you publish or print words of any kind, you won't want any mistakes to slip through. You want to ensure that what you produce is the best that it can be. This is especially true if you are printing anything. Mistakes on the web can be corrected. You don't have that luxury with print. Print has permanency. Just think how you'd feel if you'd been the sign writer who painted 'SHCOOL' in big white letters on the road when you meant to spell 'SCHOOL'. Or that you'd given the OK to a sign that read 'DRIVE-THRU ENTERANCE'. These are real examples. You'll find more proofreading howlers like these later in this book.

Again, proofreading is an essential part of the publishing process. The larger the font, the more you should check it. The more permanent the publication or installation, the more you should check it. You should check and re-check everything you plan to publish until your eyes ache or until the words start to look incorrect and you have to look them up again just to make sure that you're not going crazy. And if you have time for a re-re-check, so much the better.

# Typical Code Review Workflow



## Requests Review



Waitlist

Reviews

Merge

Abandon

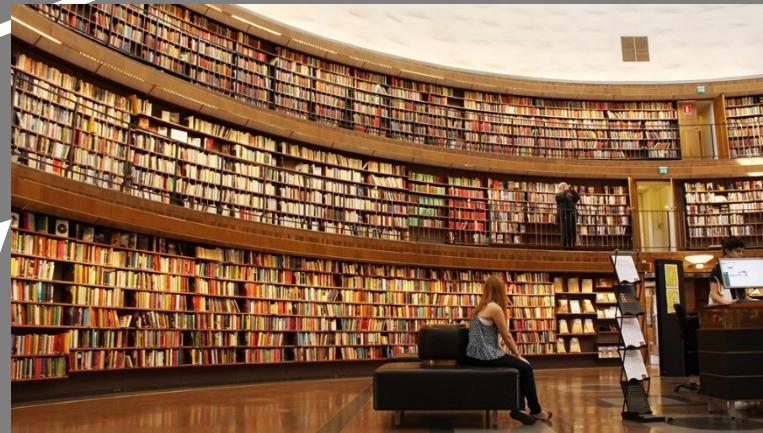
PAGE 111 SHEP APPLE DOS

3573  
3574 3755 ADF137  
3575 3758 BDE337  
3576 375B 3B  
3577 375C ADE737  
3578 375F EDE337  
3579 3762 BDE037  
3580 3765 BDE237  
3581  
3582 3768 A990  
3583 376A BDEC37  
3584 376D BDED37  
3585 3770 BDF037  
3586  
3587 3773 ADE737  
3588 3776 BDF137  
3589 3779 BDFE36  
3590  
3591 377C A90A  
3592 377E BDE137  
3593 3781 0A A945  
3594 3782 0A 3 EA  
3595 3783 0A 3 EA  
3596 3784 8DF36  
3597  
3598 3787 A902  
3599 3789 BDF437  
3600  
3601 378C 209F37  
3602  
3603 378F ADE337  
3604 3792 BDF137  
3605  
3606 3795 ADE037  
3607 3798 BDE137  
3608 379B 209F37  
3609  
3610 379E 60  
3611

WBOOT PAGE

LDA #0	IBUFF+1	GET START OF DOS
STA BNDOS		SAVE IT
SEC		
LDA ADDSLD+1		CALCULATE
SBC BNDOS		
STA NDPOS		END DOS PAGES
STA BSSSEC		
LDA #10		
STA IBTRK		TRACK=0
STA IBSECT		SECTOR=0
STA IBUFF		
LDA ADDSLD+1		GET BOOT START ADR
STA IBUFF+1		TO BUFF
GRSPQ		TO GARBAGE RECORD
LDA #10		
STA BRWCNT		END OF BOOT PAGES
ASLA		TO BOOT I/O COUNTER
ASLA #48		AND
ASLA #0		TO
GRPC		GARBAGE RECORD
LDA #ISWTWS		
STA ISCMD		SET WRITE
JBR BOOTIO		
		GO WRITE BOOT SECTORS
LDA BNDOS		
STA IBUFF+1		SET START OF DOS
LDA NDPOS		
STA BRWCNT		
JBR BOOTIO		GO WRITE DOS
RTS		DONE

more



# Mailing List Code Review

**From** [REDACTED]  
**Subject** [patch] Fix cross-user symlink race condition vulnerability  
**Date** Wed, 31 Oct 2012 04:46:47 GMT

There is a race condition vulnerability in httpd 2.2.23 (also present in previous releases) that allows a malicious user to serve arbitrary files from nearly anywhere on a server that isn't protected by strict os level permissions. In a shared hosting environment, this is a big vulnerability.

If you would like more information on the exploit itself, please let me know. I have a proof of concept that is able to hit the exploit with 100% success.

This is my first patch submitted to Apache, so I'm sorry if I've missed something. I'm aware that this doesn't meet some of the code standards that are in place (e.g, it doesn't work at all on Windows), but I wanted to put it out there anyway.

The patch that fixes the vulnerability is attached. Thank you in advance for the feedback.

--

[REDACTED]  
Mike Jacobs  
Cluster Systems Administrator  
[REDACTED]

**Mime** • Unnamed multipart/mixed (inline, None, 0 bytes)  
    ◦ [Unnamed text/plain](#) (inline, 7-Bit, 857 bytes)  
    ◦ [httpd-2.2.23-symlink-protection.patch](#) ([text/x-patch](#)) (attachment, 7-Bit, 8324 bytes)

[View raw message](#)

# Pull Requests

# Fix a small bug in a project in GitHub Pull Requests

```
#git clone https://github.com/project/code ; cd code
```

```
#vi some.c  
#git commit -a -m 'Fix the frobinator'
```

```
#go to web UI  
#click fork
```

```
#git remote add me https://github.com/$USER/code  
#git push me master
```

```
#go to web UI  
#create pull request
```

# Fix a small bug in a project in Gerrithub

```
#git clone https://gerrit.googlsource.com/gerrit ; cd gerrit  
#vi .buckconfig  
#git commit -a -m 'Add new target alias for doc index'  
#git push origin HEAD:refs/for/master
```

# Contemporary Code Reviews



facebook



# Issues Identified code review





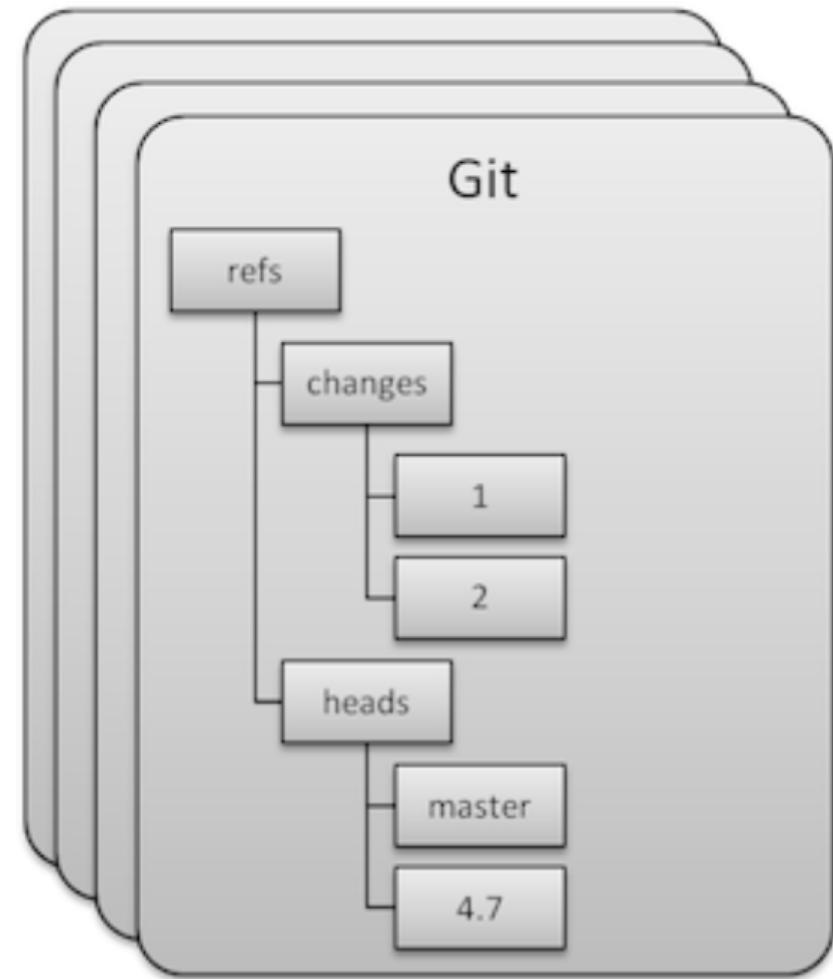
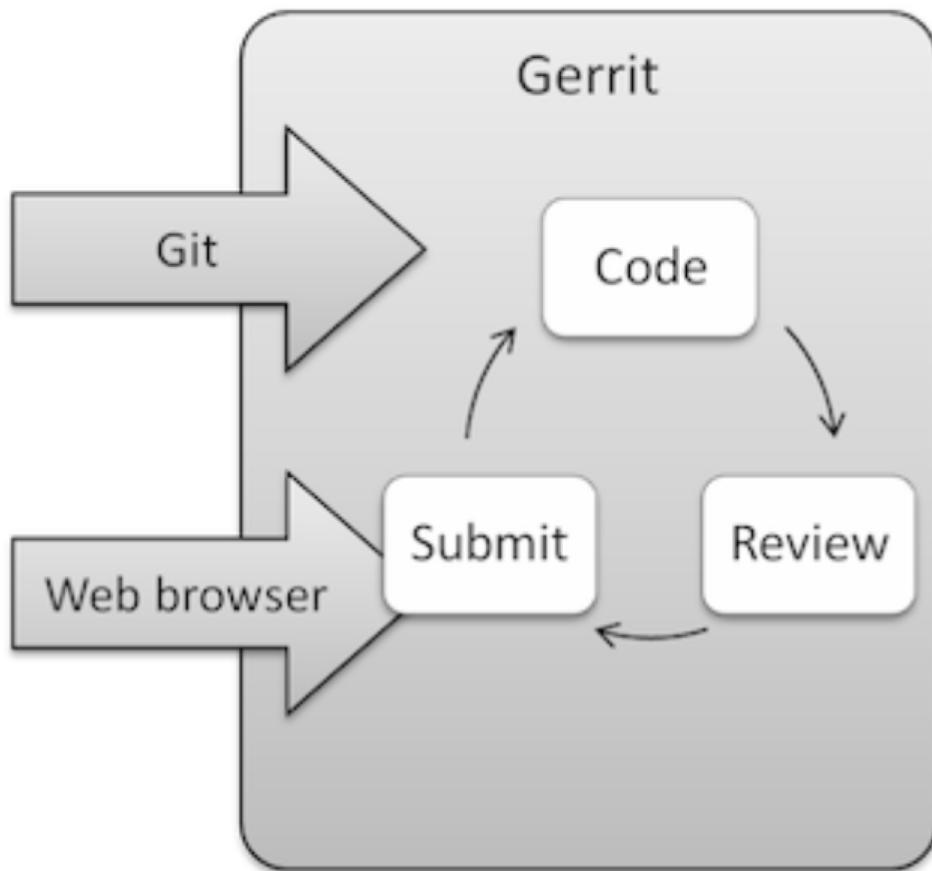
**Benefits**

# Scientific Code Review

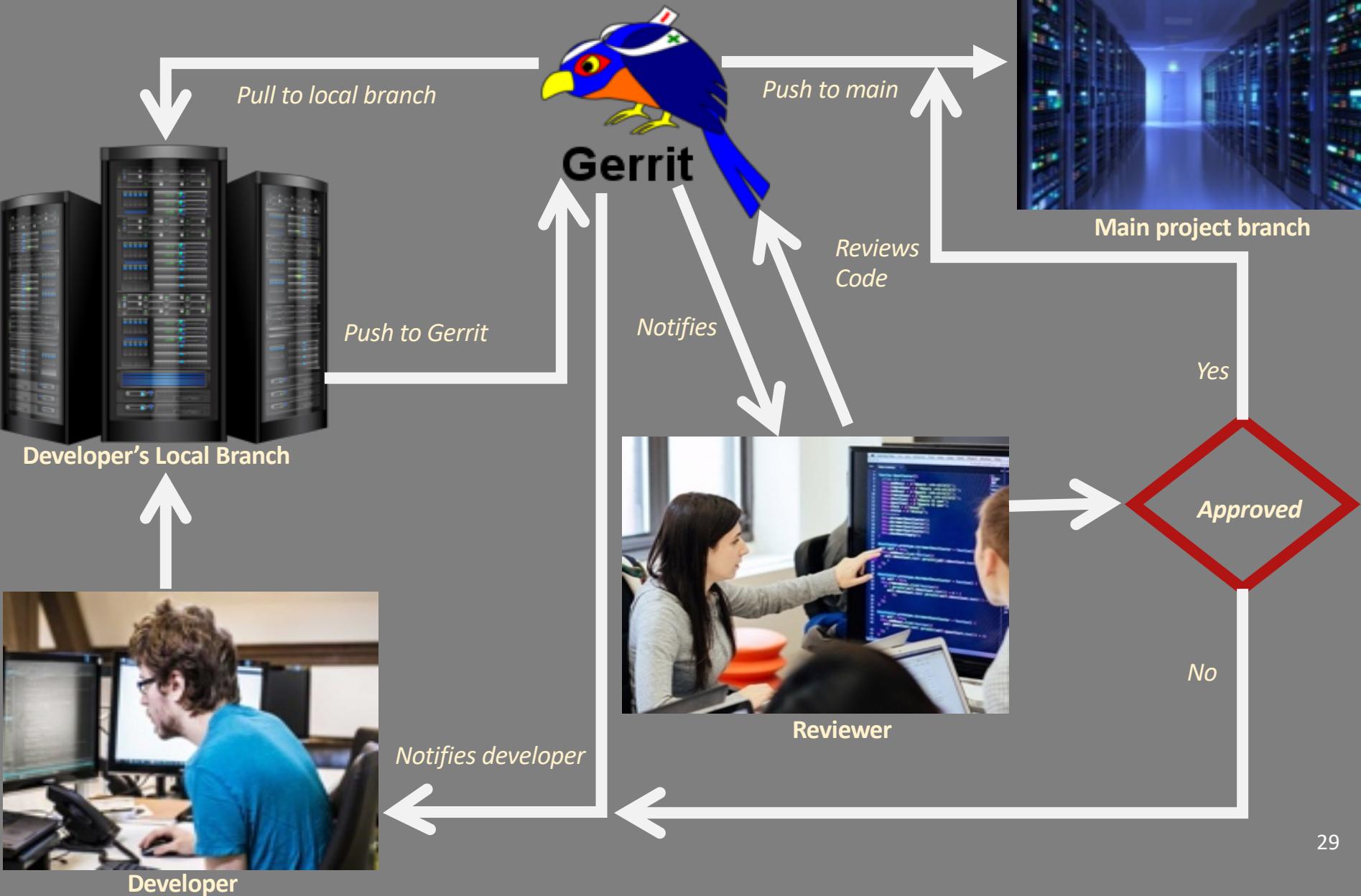




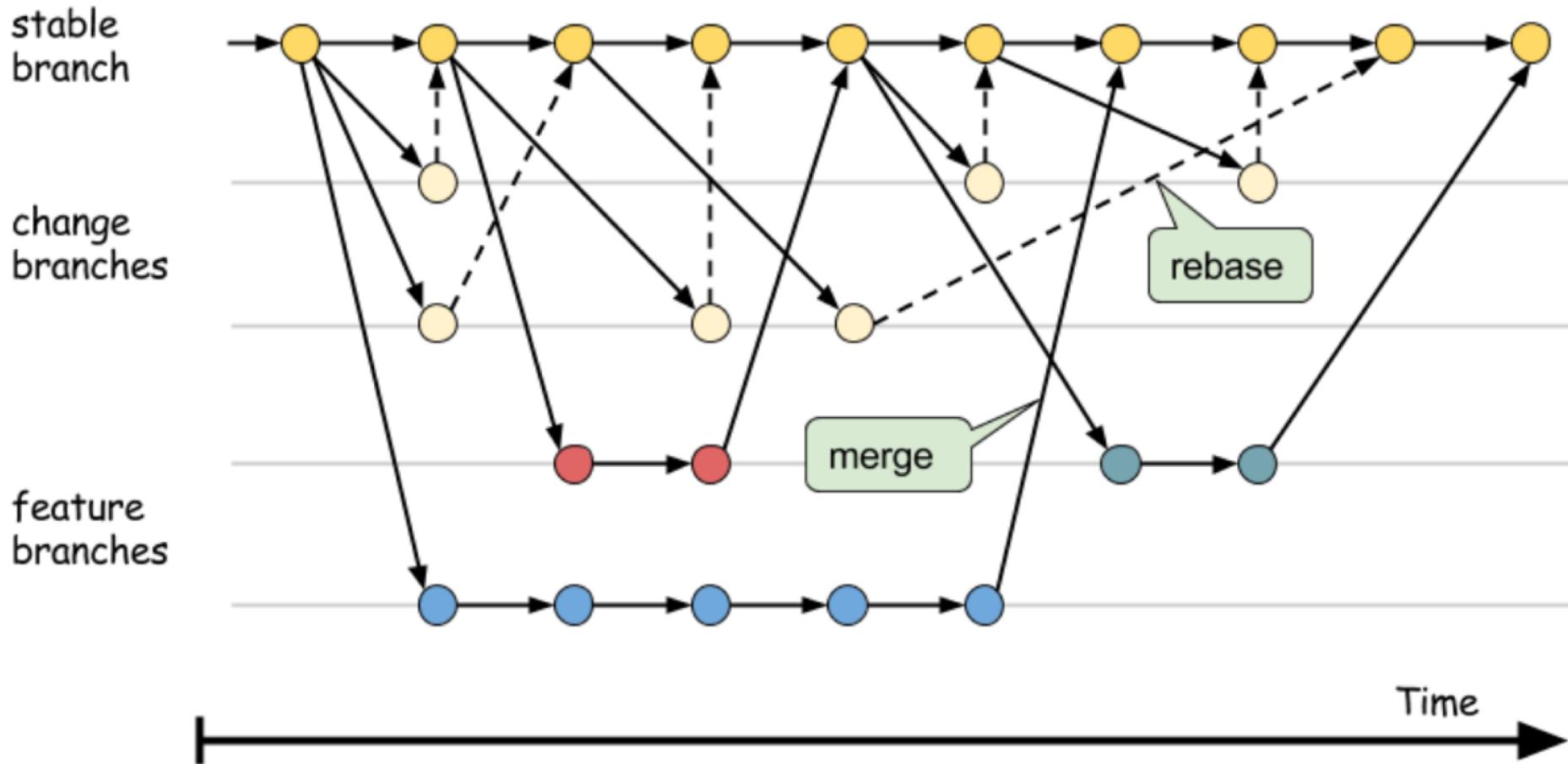




# Simplified Gerrit workflow



# Gerrit Repository Structure



# Gerrit Terminology

- **Change:**
  - The unit of review
  - Every git commit has a change-id
  - Results in a single commit when merged to the Git repository
  - Change numbers are unique and never change
- **Patch Set:**
  - A revision of a Change
  - Each time a Change is modified, it will receive a new patch set
  - Patch set numbering starts from 1
  - Technically, a patch set is a unique Git commit

# Gerrit Terminology

- **Label**
  - A rating category that allows or blocks progress of a change.  
(i.e. Build, Deploy, Code Review)
- **Score**
  - The rating given to a label.
  - Code review spans +2 to -2
- **Submit**
  - Merges a change into the repository - until this happens, the code is outside of the repo
- **Abandon**
  - Archives a change (can be restored later)
- **Project**
  - A Git repository

# Review Scores

Score	Description	Action
-2	This shall not be merged	Blocks submit
-1	I would prefer this is not merged as is	None
0	No score	None
+1	Looks good to me, but someone else must approve	None
+2	Looks good to me, approved	Allows submit

# Gerrit Installation

<http://bit.ly/Gerrit-Tutorial-eScience18>

- Sign in to <https://github.com>
- Create two new repositories-
  - 'exercise1' & 'exercise2'
- Go to <http://gerrithub.io>

[First time Sign In](#)[Open Gerrit Code Review](#)

## Gerrit Code Review with GitHub repositories

**GitHub** is the most popular free Git hosting in the world with over 5 Millions repositories! You can now use it with the power of **Gerrit**, the best **Enterprise Engine** for Git and Code Review.



### Sign in with GitHub

Use your existing GitHub account for logging in with Gerrit.



### Import repositories

Get your code hosted on GitHub visible and replicated in Gerrit.



### Code review workflow

Implement the Code Review using Gerrit workflow User-Experience.



### GitHub pull requests

Keep in touch with external users synchronizing pull requests with reviews.

## 2. Set up replication

**1**

### Sign-in to GitHub

Login to Gerrit using your GitHub credentials: **you need to authorize**

**GerritHub** to access your account, keys and repositories. With a **single click** you can start using **Gerrit Code Review**.

**2**

### Replicate Git repositories

Gerrit automatically replicates all the changes back and forth to GitHub. Allows to **integrate with Community-based OpenSource** project whilst keeping a **single Enterprise Git repository in Gerrit**.

**3**

### Pull requests with Gerrit

Fetch your GitHub pull requests and upload them in Gerrit for review. Enable a **single point of validation** of the Code Review workflow and keep your **external contributors up-to-date** on GitHub.

[Sign In using GitHub credentials >>](#)

[Sign In](#)



## What should I do for getting started ?

1. [Sign In](#) with your GitHub username and password
2. [Allow GerritHub](#) accessing your profile
3. Select the [SSH Public Keys](#) you want to import
4. Select the [Git repositories](#) you want to use

## Why you need to login using GitHub ?

[GerritHub and GitHub work together](#) to give you Code Review on your existing repositories: your identity on Gerrit is synchronized with your GitHub identity.

## Why GerritHub requires write permissions ?

GerritHub needs a [user:email+public\\_repo scopes](#) when authenticating with the [GitHub API](#): the only information read from your profile are [your full name, e-mail and SSH public keys](#): we do NOT write any information to your GitHub profile or followers or share with any other service on-line.

When start using GerritHub, your [Git commits and patches for review will be mirrored back to GitHub](#) thanks to Gerrit replication mechanism. [GerritHub pushes on your behalf your reviewed commits to your GitHub repositories](#).

In order to get the replication work properly, you should [push to Gerrit](#) and use your [GitHub repository for pull and pull-requests only](#). If you keep on [pushing directly to GitHub](#) you would cause the Gerrit [replication process to stop](#): this is done for avoiding to overwrite the GitHub history because of the potential conflicts.

The image shows a 'Sign In' form with a blue header bar containing the text 'Sign In'. Below the header are two input fields: 'Username or Email' containing 'jdoe123' and 'Password (forgot password)' containing a redacted password. To the right of the form is a large green circle with the number '1' inside it. There are also left and right navigation arrows on either side of the form.

## Login Scope Selection

[Cancel](#)[Login >](#)

Which level of GitHub access do you need?

**DEFAULT**

*Review and contribute to public repos using your e-mail identity and organizations' membership*

Allow to: Access e-mail addresses , Read and push to public repos , Read membership to public/private organizations

**Reviewer**

*Review other people's changes using only your e-mail identity (EU Citizens for GDPR)*

Allow to: Access e-mail addresses

**Private**

*Review and contribute to private and public repos using your e-mail identity and organizations' membership*

Allow to: Read/write profile info , Read and push to public and private repos

Remember my choice



## Authorize GerritHub



**GerritHub by gerritforge-ltd**  
wants to access your **tutorialtest43** account



**Personal user data**

Email addresses (read-only)



**Repositories**

Public only



**Organizations and teams**

Read-only access



**Authorize gerritforge-ltd**

Authorizing will redirect to  
<https://review.gerrithub.io>

## Account profile

[Cancel](#)[Next >](#)

### GitHub account details

Username:

Full name:

e-Mail:  

### Import GitHub SSH Public Keys

## Account > Repositories Replication

[Cancel](#)[Import >](#)

### Select GitHub repositories to clone and replicate

 tutorialtest57

/ Repository name

Filter by name

10

Rows

**i** Not seeing your organizations or repositories? [Login with a different GitHub Scope](#) and try again.

 PUBLIC tutorialtest57 / **exercise1** PUBLIC tutorialtest57 / **exercise2**

## Account > Repositories Replication

[Cancel](#)[Next >](#)

### Select GitHub repositories to clone and replicate

 tutorialtest57

/ Repository name

 Filter by name10  Rows

**i** Not seeing your organizations or repositories? Login with a different GitHub Scope and try again.

PUBLIC [tutorialtest57 / exercise1](#)



Done: repository replicated to Gerrit.

PUBLIC [tutorialtest57 / exercise2](#)



Done: repository replicated to Gerrit.

## Account > Repositories Replication > Opened Pull Requests

[Cancel](#)[Next >](#) Rows[First](#)[Previous](#)[Next](#)[Last](#)**Id****Repository / Pull  
request subject /  
Author****Timestamp**[All repositories](#)

0

No data available in table



Subject	Status	Owner	Assignee	Project	Branch	
<b>Work in progress</b>						tutorialtest57 ttestemail57@gmail.com
No changes						
<b>Outgoing reviews</b>						
No changes						
<b>Incoming reviews</b>						
No changes						
<b>Recently closed</b>						
No changes						



- tutorialtest57
- ttestemail57@gmail.com
- [Settings](#)
- [Sign out](#)

[Profile](#)[Preferences](#)[Diff Preferences](#)[Menu](#)[Change Table Colu...](#)[Notifications](#)[Email Addresses](#)[HTTP Credentials](#)[SSH Keys](#)[Groups](#)[Mail Filters](#)

## User Settings

### Profile

ID	1015254
Email	ttestemail57@gmail.com
Registered	12:41 PM
Username	tutorialtest57
Full name	tutorialtest57
Status	

[SAVE CHANGES](#)

### Preferences

Changes per page	25 rows per page ▾
Date/time format	Jun 3 ; Jun 3, 2016 ▾ 4:10 PM ▾
Email notifications	Only comments left by others ▾
Email format	HTML and plaintext ▾
Diff view	Side by side ▾
Expand inline diffs	<input type="checkbox"/>
Publish comments on push	<input type="checkbox"/>
Set new changes to "work in progress" by default	<input type="checkbox"/>

[Profile](#)[Preferences](#)[Diff Preferences](#)[Menu](#)[Change Table Colu...](#)[Notifications](#)[Email Addresses](#)[HTTP Credentials](#)[SSH Keys](#)[Groups](#)[Mail Filters](#)

## HTTP Credentials

Username

tutorialtest57

[GENERATE NEW PASSWORD](#)

## SSH keys

Comment

Status Public key

[SAVE CHANGES](#)

New SSH key

New SSH Key

[ADD NEW SSH KEY](#)

## Groups

Name	Description	Visible to all
<a href="#">Anonymous Users</a>		No
<a href="#">kubedge-admin</a>	people who can manage kubedge projects	No
<a href="#">Registered Users</a>		No
<a href="#">TestGroup</a>	asdfasdf	No
<a href="#">user/tutorialtest57</a>		No
<a href="#">userid/tutorialtest57</a>		No

## Mail Filters

Gerrit emails include metadata about the change to support writing mail filters.

Here are some example Gmail queries that can be used for filters or for searching through archived messages.  
View the [Gerrit documentation](#) for the complete set of footers.

Name

Query

[Profile](#)[Preferences](#)[Diff Preferences](#)[Menu](#)[Change Table Colu...](#)[Notifications](#)[Email Addresses](#)[HTTP Credentials](#)[SSH Keys](#)[Groups](#)[Mail Filters](#)

## HTTP Credentials

Username tutorialtest57

[GENERATE NEW PASSWORD](#)

## SSH keys

Comment

Status Public key

[SAVE CHANGES](#)

New SSH key

New SSH Key

[ADD NEW SSH KEY](#)

New Password:

E/f7z0fM9QDCtH0FtEg6p+zeNZ7Jln1vYeNkYaNvng

*This password will not be displayed again.  
If you lose it, you will need to generate a new one.*

[CLOSE](#)[TestGroup](#)

asdfasdf

No

[user/tutorialtest57](#)

No

[userid/tutorialtest57](#)

No

## Mail Filters

Gerrit emails include metadata about the change to support writing mail filters.

Here are some example Gmail queries that can be used for filters or for searching through archived messages.  
View the [Gerrit documentation](#) for the complete set of footers.

Name

Query



Subject	Status	Owner	Assignee	Project	Branch	Updated
<b>Work in progress</b>						
No changes						
<b>Outgoing reviews</b>						
No changes						
<b>Incoming reviews</b>						
No changes						
<b>Recently closed</b>						
No changes						

Projects

Filter:

Groups

Project Name	Project Description
--------------	---------------------

007-surajit/Directory-List-PhoneGap-Plugin	A plugin to list contents of application directory for iOS and Android Cordova apps
01org/ciao	Ciao - Cloud Integrated Advanced Orchestrator
091387-ea975-lab3/ea975-lab3	Lab 3 - Gerrit + Github
Ointro/plan9-contrib	Plan 9 from Bell Labs, with contributions.
0s4l/cloaked-archer	
0s4l/cloaked-archer-2	
0s4l/dsf	
0x707/g_train2	
0x707/gerrit_train	
0x707/t_train	training
100591487/Lab-1	Lab 1 files
118DBK/GerritTest	GerritTest
11NJ/frameworks_support	
11NJ/git-repo	
11NJ/ldd3-examples-3.x	port ldd3 source code examples to linux 3.x
11NJ/spring-oauth-server	
11NJ/springapp	
11NJ/springrest	

Projects

Filter: tutorialtest57

Groups

Project Name	Project Description	Repository Browser	Re...
tutorialtest57/exercise1		(GitHub)	
tutorialtest57/exercise2		(GitHub)	

Projects[tutorialtest57/exerci...](#)[Access](#)[Commands](#)[Branches](#)[Tags](#)[Groups](#)

# tutorialtest57/exercise1

## Download

[ANONYMOUS HTTP](#) [HTTP](#) [SSH](#)

Clone with commit-msg hook

```
git clone https://tutorialtest57@review.gerrithub.io/a/tutorialtest57/exercise1 && (cd exercise1)
```

[COPY](#)

Clone

```
git clone https://tutorialtest57@review.gerrithub.io/a/tutorialtest57/exercise1
```

[COPY](#)

## Configurations

### Description

&lt;Insert project description here&gt;

### Project Options

State

Active

Submit type

Merge if necessary

Allow content merges

Inherit (true)

Create a new change for every  
commit not in the target branch

Inherit

Require Change-Id in commit  
message

Inherit

Reject implicit merges when  
changes are pushed for review

Inherit

Enable adding reviewers to changes



## Gerrit Review UI

# Code Review Exercise 1

- Download dayOfYear.java from:  
<https://se4science.org/tutorials/escience18>
- Upload code to the “exercise1”repository you created while setting up GerritHub
- Review the code

# Discussion

```
public static int dayOfYear(int month, int dayOfMonth, int year) {  
    if (month == 2) {  
        dayOfMonth += 31;  
    } else if (month == 3) {  
        dayOfMonth += 59;  
    } else if (month == 4) {  
        dayOfMonth += 90;  
    } else if (month == 5) {  
        dayOfMonth += 31 + 28 + 31 + 30;  
    } else if (month == 6) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31;  
    } else if (month == 7) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30;  
    } else if (month == 8) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31;  
    } else if (month == 9) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31;  
    } else if (month == 10) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30;  
    } else if (month == 11) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31;  
    } else if (month == 12) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31 + 31;  
    }  
    return dayOfMonth;  
}
```

Don't repeat yourself

```
public static int dayOfYear(int month, int dayOfMonth, int year) {  
    if (month == 2) {  
        dayOfMonth += 31;  
    } else if (month == 3) {  
        dayOfMonth += 59;  
    } else if (month == 4) {
```

Comments Where  
Needed

```
    /** @param month month of the year, where January=1 and Dec  
     * ember=12 [C1] */  
    public static int dayOfYear(int month, int dayOfMonth, int y  
ear) {  
        if (month == 2) {          // we're in February [C2]  
            dayOfMonth += 31;    // add in the days of January tha  
t already passed [C3]  
        } else if (month == 3) {  
            dayOfMonth += 59;    // month is 3 here [C4]  
        } else if (month == 4) {  
            dayOfMonth += 90;  
        }  
        ...  
    } else if (month == 12) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31  
+ 30 + 31 + 31;  
    }  
    return dayOfMonth; // the answer [C5]
```

```
public static int dayOfYear(int month, int dayOfMonth, int year) {  
    if (month == 2) {  
        dayOfMonth += 31;  
    } else if (month == 3) {  
        dayOfMonth += 59;  
    } else if (month == 4) {  
        dayOfMonth += 90;  
    } else if (month == 5) {  
        dayOfMonth += 31  
    } else if (month == 6) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31;  
    } else if (month == 7) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30;  
    } else if (month == 8) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31;  
    } else if (month == 9) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31;  
    } else if (month == 10) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30;  
    } else if (month == 11) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31;  
    } else if (month == 12) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31 + 31;  
    }  
    return dayOfMonth;  
}
```

Fail Fast

February 9, 2019

dayOfYear(1,9,2019)

dayOfYear(9,2,2019)

dayOfYear(2019,2,9)

```
public static int dayOfYear(int month, int dayOfMonth, int year) {  
    if (month == 2) {  
        dayOfMonth += 31;  
    } else if (month == 3) {  
        dayOfMonth += 59;  
    } else if (month == 4) {  
        dayOfMonth += 90;  
    } else if (month == 5) {  
        dayOfMonth += 31 + 28 + 31 + 30;  
    } else if (month == 6) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31;  
    } else if (month == 7) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 31 + 30;  
    } else if (month == 8) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30;  
    } else if (month == 9) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31;  
    } else if (month == 10) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31 + 31;  
    } else if (month == 11) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 31 + 30 + 31 + 31;  
    } else if (month == 12) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 31 + 30 + 31 + 31;  
    }  
    return dayOfMonth;  
}
```

Fail Faster

```
public static int dayOfYear(int month, int dayOfMonth, int year) {  
    if (month == 2) {  
        dayOfMonth += 31;  
    } else if (month == 3) {  
        dayOfMonth += 59;  
    } else if (month == 4) {  
        dayOfMonth += 90;  
    } else if (month == 5) {  
        dayOfMonth += 31 + 28 + 31 + 30;  
    } else if (month == 6) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31;  
    } else if (month == 7) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30;  
    } else if (month == 8) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31;  
    } else if (month == 9) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31;  
    } else if (month == 10) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30;  
    } else if (month == 11) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31;  
    } else if (month == 12) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31 + 31;  
    }  
    return dayOfMonth;  
}
```

## Avoid Magic Numbers

```
public static int dayOfYear(int month, int dayOfMonth, int year) {  
    if (month == 2) {  
        dayOfMonth += 31;  
    } else if (month == 3) {  
        dayOfMonth += 59;  
    } else if (month == 4) {  
        dayOfMonth += 90;  
    } else if (month == 5) {  
        dayOfMonth += 31 + 28 + 31 + 30;  
    } else if (month == 6) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31;  
    } else if (month == 7) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30;  
    } else if (month == 8) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31;  
    } else if (month == 9) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31;  
    } else if (month == 10) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30;  
    } else if (month == 11) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31;  
    } else if (month == 12) {  
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31 + 31;  
    }  
    return dayOfMonth;  
}
```

One Purpose for each  
variable

# Code Review Exercise 2

- Download leapYear.java from:  
<https://se4science.org/tutorials/escience18>
- Upload the code to the  
“exercise2”repository you created while  
setting up GerritHub
- Review the code

## Use Good Names

```
public static boolean leap(int y) {  
    String tmp = String.valueOf(y);  
    if (tmp.length() > 5) return true;  
    return false;  
}
```

- methodsAreNamedWithCamelCaseLikeThis
- variablesAreAlsoCamelCase
- CONSTANTS\_ARE\_IN\_ALL\_CAPS\_WITH\_UNDERSCORES
- ClassesAreCapitalized
- packages.are.lowercase.and.separated.by.dots

}

## Magic Numbers

```
public static boolean leap(int y) {  
    String tmp = String.valueOf(y);  
    if (tmp.charAt(2) == '1' || tmp.charAt(2) == '3' || tmp.charAt(2) == 5  
        || tmp.charAt(2) == '7' || tmp.charAt(2) == '9') {  
        if (tmp.charAt(3)=='2'||tmp.charAt(3)=='6') return true; /*R1*/  
        else  
            return false; /*R2*/  
    }else{  
        if (tmp.charAt(2) == '0' && tmp.charAt(3) == '0') {  
            return false; /*R3*/  
        }  
        if (tmp.charAt(3)=='0'||tmp.charAt(3)=='4'||tmp.charAt(3)=='8')  
            return true; /*R4*/  
    }  
    return false; /*R5*/  
}
```

## Use Whitespace to Help the Reader

```
public static bo~  
String tmp = string.valueAt(y);  
if (tmp.charAt(2) == '1' || tmp.charAt(2) == '3' || tmp.charAt(2) == 5  
|| tmp.charAt(2) == '7' || tmp.charAt(2) == '9') {  
    if (tmp.charAt(3)=='2'||tmp.charAt(3)=='6') return true; /*R1*/  
    else  
        return false; /*R2*/  
}else{  
    if (tmp.charAt(2) == '0' && tmp.charAt(3) == '0') {  
        return false; /*R3*/  
    }  
    if (tmp.charAt(3)=='0'||tmp.charAt(3)=='4'||tmp.charAt(3)=='8')  
        return true; /*R4*/  
}  
return false; /*R5*/  
}
```

## Bugs hidden in this code

```
public static boolean leap(int y) {  
    String tmp = String.valueOf(y);  
    if (tmp.charAt(2) == '1' || tmp.charAt(2) == '3' || tmp.charAt(2) == 5  
        || tmp.charAt(2) == '7' || tmp.charAt(2) == '9') {  
        if (tmp.charAt(3)=='2'||tmp.charAt(3)=='6') return true; /*R1*/  
        else  
            return false; /*R2*/  
    }else{  
        if (tmp.charAt(2) == '0' && tmp.charAt(3) == '0') {  
            return false; /*R3*/  
        }  
        if (tmp.charAt(3)=='0'||tmp.charAt(3)=='4'||tmp.charAt(3)=='8')  
            return true; /*R4*/  
    }  
    return false; /*R5*/  
}
```

# Other Code Review Tools

# Code Review Tools



Gerrit: <https://code.google.com/p/gerrit/>



Review Board: <https://www.reviewboard.org/>



Phabricator: <https://phabricator.org/>



Crucible:  
<https://www.atlassian.com/software/crucible>

# Feedback And Discussion

# Feedback

<http://bit.ly/eScience-CR-Tutorial-Feedback>

# Code Review

# BEST PRACTICE





Collaborate?

@SE4Science 

Jeffrey Carver  
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<http://BSSw.io>

# Photo Credits

- <http://incolors.club/collectionfdwn-female-computer-programmer.htm>
- <http://tech.trivago.com/img/posts/code-review/code-review-3.jpg>
- <http://www.protectitip.com/wp-content/uploads/2014/11/Software-Code.jpg>
- [http://www.computerhistory.org/atchm/wp-content/uploads/2013/11/markup\\_listing-542x404.jpg](http://www.computerhistory.org/atchm/wp-content/uploads/2013/11-marked_up_listing-542x404.jpg)
- <https://static1.squarespace.com/static/53798babe4b0fca9449cf693/t/53f78774e4b0ce4d05e4152f/1408730997720/>
- <https://residentialwastesystems.com/wp-content/uploads/2016/10/dumpsters-trumbull-ct.jpg>
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