CMPSC 290
Principles of Software Development
Fall 2013

Laboratory Assignment One: Version Control with Git and Bitbucket

Introduction

Practicing software engineers normally use a version control system to manage most of the artifacts produced during the phases of the software development life cycle. In this course, we will always use the Git distributed version control system to manage the files associated with our laboratory assignments. In this laboratory assignment, you will learn how to use the Bitbucket service for managing Git repositories and the `git` command-line tool in the Ubuntu Linux operating system.

Configuring Git and Bitbucket

During this laboratory assignment and subsequent assignments, we will securely communicate with the Bitbucket.org servers that will host our all of our projects. In this laboratory assignment, we will perform all of the steps to configure the accounts on the departmental servers and the Bitbucket service. Throughout the assignment, you should refer to the following Web site for additional information: `https://confluence.atlassian.com/display/BITBUCKET/Bitbucket+101`. As you will be required to prepare a tutorial describing each step that you finish in this assignment, please be sure to keep a record of all of the steps that you complete and the challenges that you face. You are also responsible for working with your team members to ensure that every member of the team is able to successfully complete each of the steps outlined in this assignment.

1. If you have never done so before, you must use the `ssh-keygen` program to create secure-shell keys that you can use to support your communication with the Bitbucket servers. Type `man ssh-keygen` and talk with the members of your team to learn more about how to use this program. What files does `ssh-keygen` produce? Where does this program store these files?

2. If you do not already have a Bitbucket account, please go to the Bitbucket Web site and create one — make sure that you use your `allegheny.edu` email address so that you can create an unlimited number of free Bitbucket repositories.

3. Now, you need to test to see if you can authenticate with the Bitbucket servers. Open a terminal window on your workstation and change into the directory where you will store your files for this laboratory assignment. Then, please type the following command: `git clone git@bitbucket.org:gkapfham/cs290f2013-lab1.git`. If everything worked correctly, you should be able to download all of the files that I used for the introductory presentation in Computer Science 290 Fall 2013. Please resolve any problems that your encountered by first reviewing the Bitbucket documentation and then working with your team members.

4. To ensure that you can prepare your own presentation using your own version of the files that you downloaded, please review and discuss the files `cs290F2013-introduction.html` and `big.css`. You can learn about this presentation framework by visiting: `https://github.com/tmcw/big`. Please ask the instructor if you have questions about this source code.

Creating a New Repository

Now that you have learned how to clone an existing Git repository, you and your team members are responsible for creating a new repository that contains the source code of a presentation explaining the use of Git. Using screen shots and easy-to-understand points (and the presentation system in the cloned repository), your presentation should explain how to use the following Git commands.

1. `git init`

2. `git status`

3. `git add`

4. `git commit`

5. `git push`

6. `git pull`

7. One additional `git` command

When you presentation describes a specific Git command, it should explain its input and output with concrete examples. Your team is responsible for creating one presentation in a manner that ensures each member can make a substantial contribution. You should use a version control repository to coordinate your work on the presentation. Students who would like to learn more about Git can consult Web sites like `http://try.github.io/` and `http://gitimmersion.com/`.

To create a new Git repository that is hosted on the Bitbucket servers, a member of your team should first create a local directory and then initialize it as a local Git repository. Next, you should use the Bitbucket Web site to create a repository that has the same name as the local directory and local repository. Next, you must follow Bitbucket's instructions to push the code and tags in your local repository to the one hosted by Bitbucket's servers. After completing this step, the chosen team member should share the repository with both the course instructor and everyone else on the team. At this point, all members of the team will be able to clone the repository and manipulate the files stored inside of it. Now, you must work together to finish the required presentation!

Summary of the Required Deliverables

This assignment invites your team to submit one printed version of a tutorial that contains:

1. A description of the steps that a user must take to configure Git and Bitbucket

2. A description of the inputs, outputs, and behavior of the aforementioned Git commands

You must also ensure that the instructor has read access to your Bitbucket repository that is named according to the convention `cs290F2013-lab1-team`k, with k representing the number of your assigned team. Please see the instructor if you would like to print your tutorial slides in color.