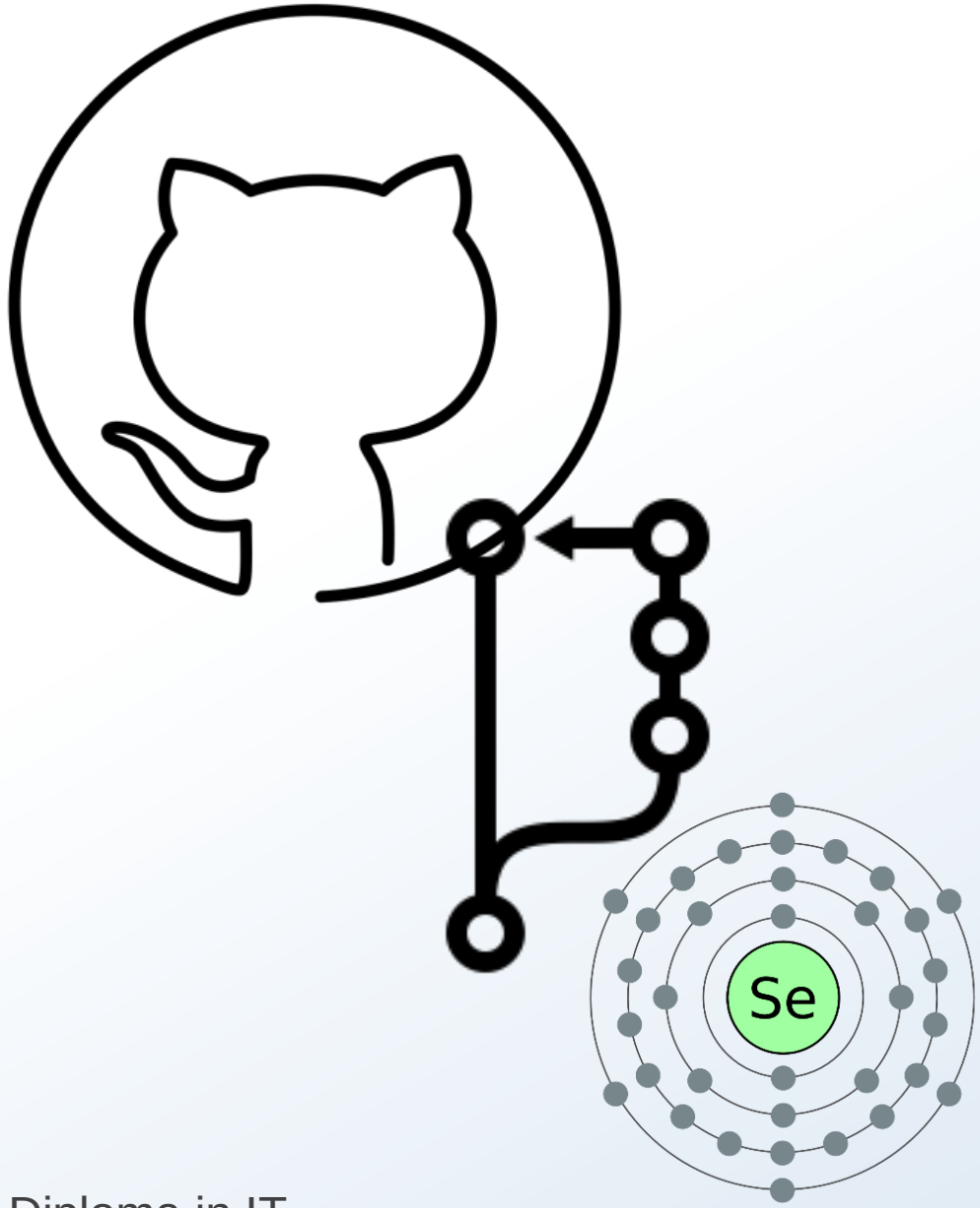
Emerging Trends in IT (ETI) Lecture 3-1



NGEE ANN
SCHOOL OF INFOCOMM TECHNOLOGY

Diploma in IT
Year 3 (2020/ 2021),
Semester 6

Learning Objective

- To do software version control using GitHub
- To use Selenium to test Graphical User Interface of a webpage.

GitHub and BitBucket

GitHub

- American company
- Hosting for software development version control using Git
- Subsidiary of Microsoft (2018)

BitBucket

- Web-based version control repository hosting service.
- Make use of either Mercurial or Git revision control systems.
- Owned by Atlassian.

Software Version Control

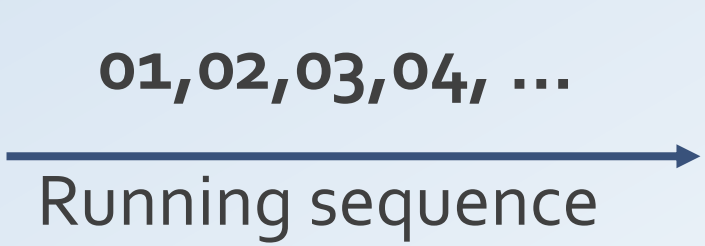
- Must have for any Software Development.
- A simple tool.
- Tracking and storing of Software Source Code
  - Earlier and Current are kept in some form of database.
  - Allows for reverting back of codes if needed.
- Developer A can develop a feature while Developer B solves another unrelated bug.
- Allows for transparency between developers in the team.
  - All information of contributor are logged.

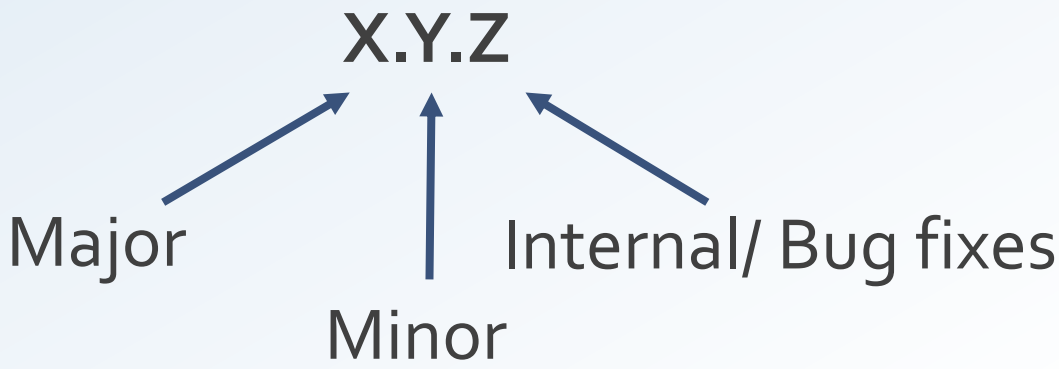
Benefits of Software Version Control

- Complete long-term change history of every file.
- Branching and merging
  - Concurrency
- Traceability on each change made.
- Complements project management and bug tracking software.

Software Version Control - Numbering Schemes

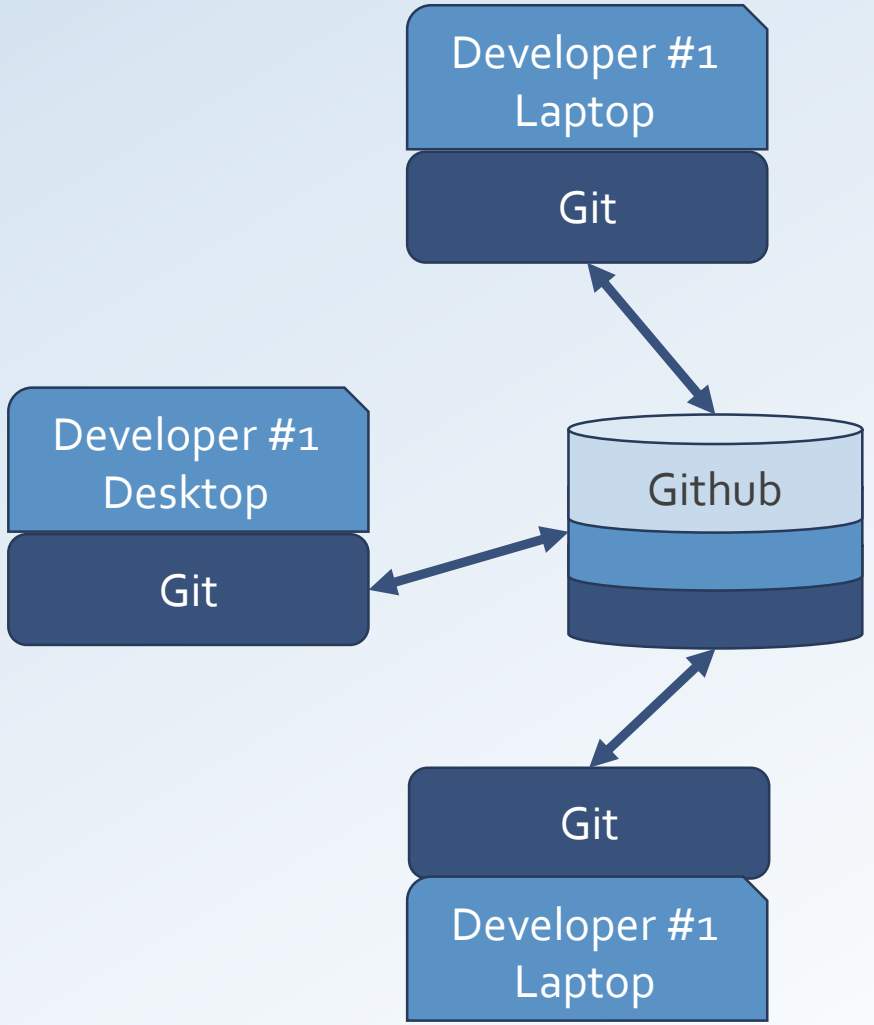
- Version numbering in the form of
  - Sequence-based versioning
    - Version number uniquely identifies the current state of the application in sequence
  - Change significance versioning
    - Version number identifies the severity of the changes done.
  - Compatibility Versioning
    - Version number for 2.2.1 and 2.4.3 are backward compatible but not 3.1.5





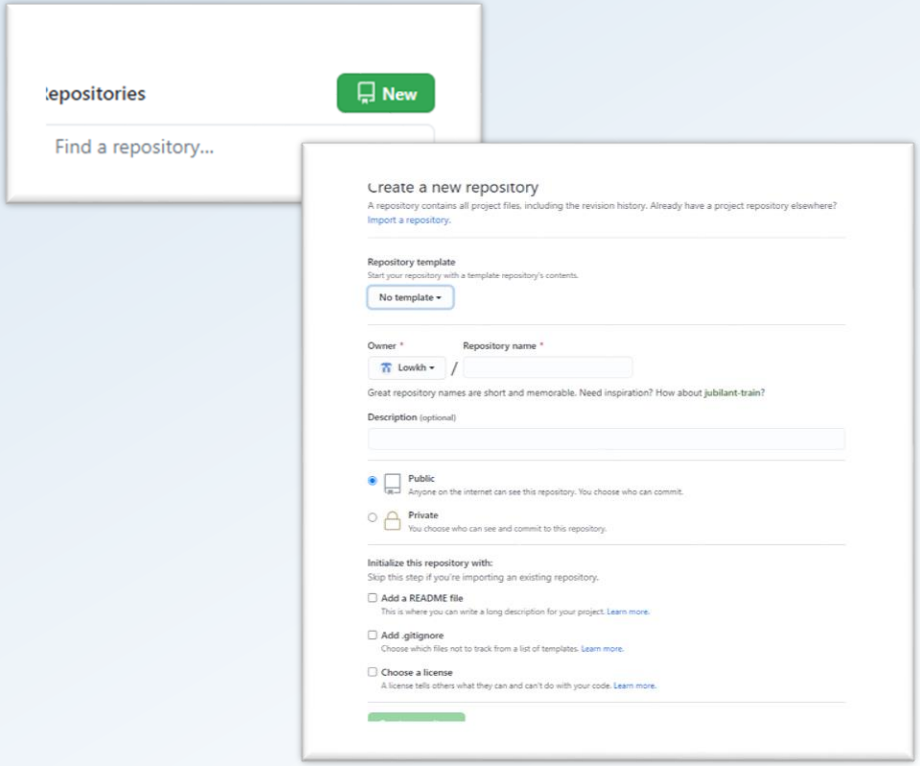
Git

- Free and Open-source
- Distributed System
- Compatible with all operating systems
- Non linear development
- Lightweight
- And the list goes on….



Git

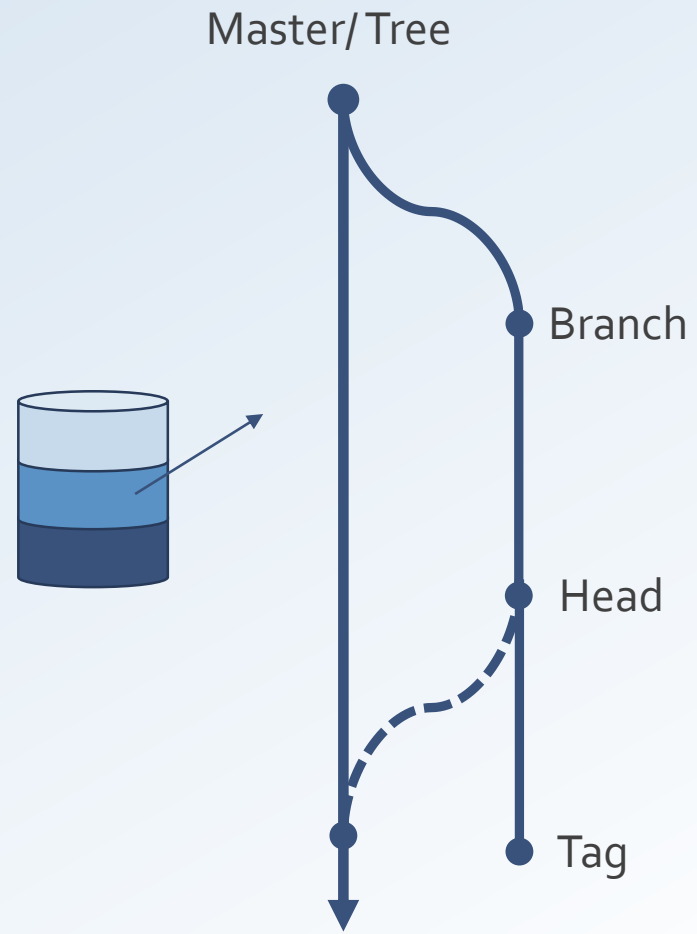
- Creation of Account
  - www.github.com
  - A representation of the owner in terms of development.
  - Serves as a profile for job interview/ demonstration.
- Creation of Git Repository
  - Public repository
  - Private repository – Invites only
- Features of Git Repository
  - Readme File
  - .gitignore file to exclude files for tracking
  - License to choose from



Software Configuration System Structural Terms

Structural Terms

- Tree / Master
  - Default branch when source code is created.
- Branch
  - "Copy" of the working project.
  - Can be named, listed or deleted with commands.
- Head
  - Last commit of the current checkout branch.
- Tag
  - Specific point of reference made in Git History
    - Usually for release or for stable development version.



Software Configuration System Activities Terms

Activities Terms

- Checkout
  - Action used to switch between different versions
    - Switch between branches in repository

```
D:\ETIGitSample\ETITestCode>git branch
  develop
* main

D:\ETIGitSample\ETITestCode>git checkout develop
Switched to branch 'develop'

D:\ETIGitSample\ETITestCode>git branch
* develop
  main
```

- Update/ Fetch
  - Action used to fetch branches and objects needed to complete history. Updates remote tracking branches.
- Commits
  - Action to record and snapshot a file or any files that was changed in the version history with a message.

Software Configuration System Activities Terms

Activities Terms

- Merge
  - Action to merge specified branch to a current branch
- Push
  - Action to upload local repository content to a remote repository.
  - This transfers commits from local to remote repository.
- Pull/ Pull Request
  - Action to receive data from repository. Fetch and merge changes to working directory.
  - Primarily used to signal a request by developer for code review.

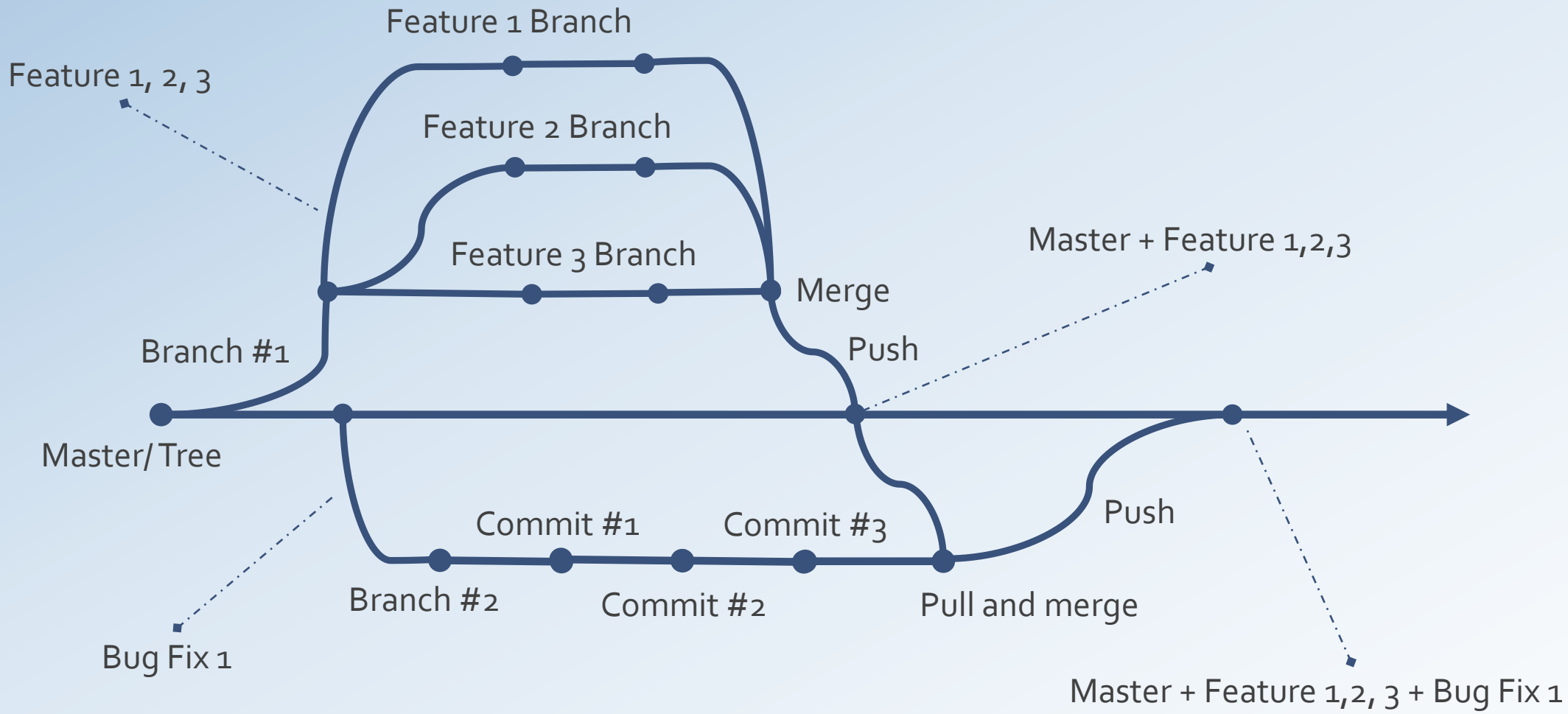
Software Configuration System Activities Terms

Activities Terms

- Log
  - Retrieves the current branch logs
  - Contains all commit messages
  - Author, date, time

```
commit 5932ee7adbc8076c17ff938ff40577c095676dd8 (HEAD -> main, develop)
Author: lkh22 <lkh22@np.edu.sg>
Date:   Wed Oct 28 23:40:03 2020 +0800

    change to edit

commit 668652e2d950a3b1806358e9bd85b85ac998c4ac
Author: lkh22 <lkh22@np.edu.sg>
Date:   Wed Oct 28 18:49:23 2020 +0800

    added new line develop

commit f1cf57846e61b3e7e282eca547431fef3d04583d (origin/main, origin/HEAD)
Author: Lowkh <54532616+Lowkh@users.noreply.github.com>
Date:   Wed Oct 28 18:12:28 2020 +0800

    Create Hello.py

D:\ETIGitSample\ETITestCode>
```

Software Version Control Flow



Selenium

"Selenium is a portable framework for testing web applications" – Wikipedia

"Selenium 2.0 = Selenium 1.0 + WebDriver" – Selenium HQ

Selenium 1.0 + WebDriver

- WebDriver – form of API interface
- Object Oriented API
- Drives web browser (require download of matching executables)
  - Chrome Browser
  - Firefox Browser
  - Internet Explorer Browser
  - Safari Browser
  - Edge Browser
  - Opera Browser
- Download for WebDriver - https://pypi.org/project/selenium/

Selenium with Python – Class Activity Example

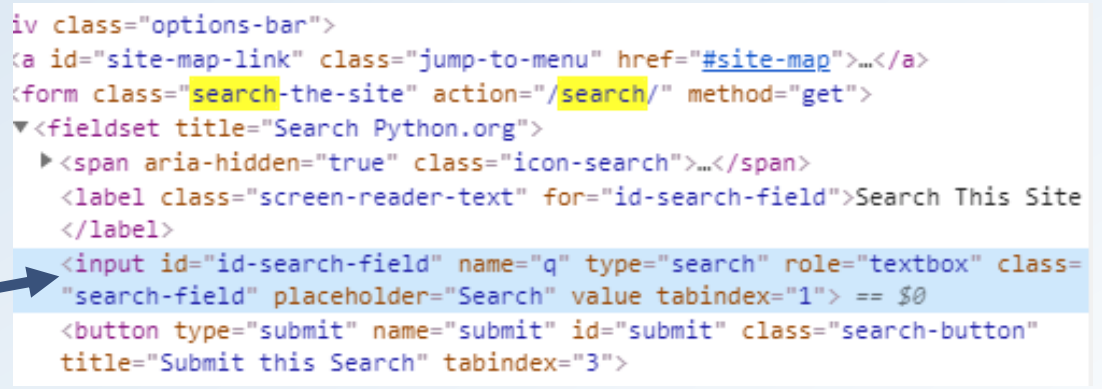
- Main code snippet for launching chrome using Selenium
  - Dependency – ChromeDriver.exe

```
import os
from selenium import webdriver

driver=webdriver.Chrome()

driver.maximize_window()
driver.get('https://www.google.com')
```

Selenium with Python – Class Activity Example

- .find_element_by_name("q")
- .clear()
- .send_keys("*This is my text*")

```
from selenium import webdriver
from selenium.webdriver.common.keys import Keys

driver = webdriver.Chrome()
driver.get("http://www.python.org")
assert "Python" in driver.title
elem = driver.find_element_by_name("q")
elem.clear()
elem.send_keys("pycon")
elem.send_keys(Keys.RETURN)
```



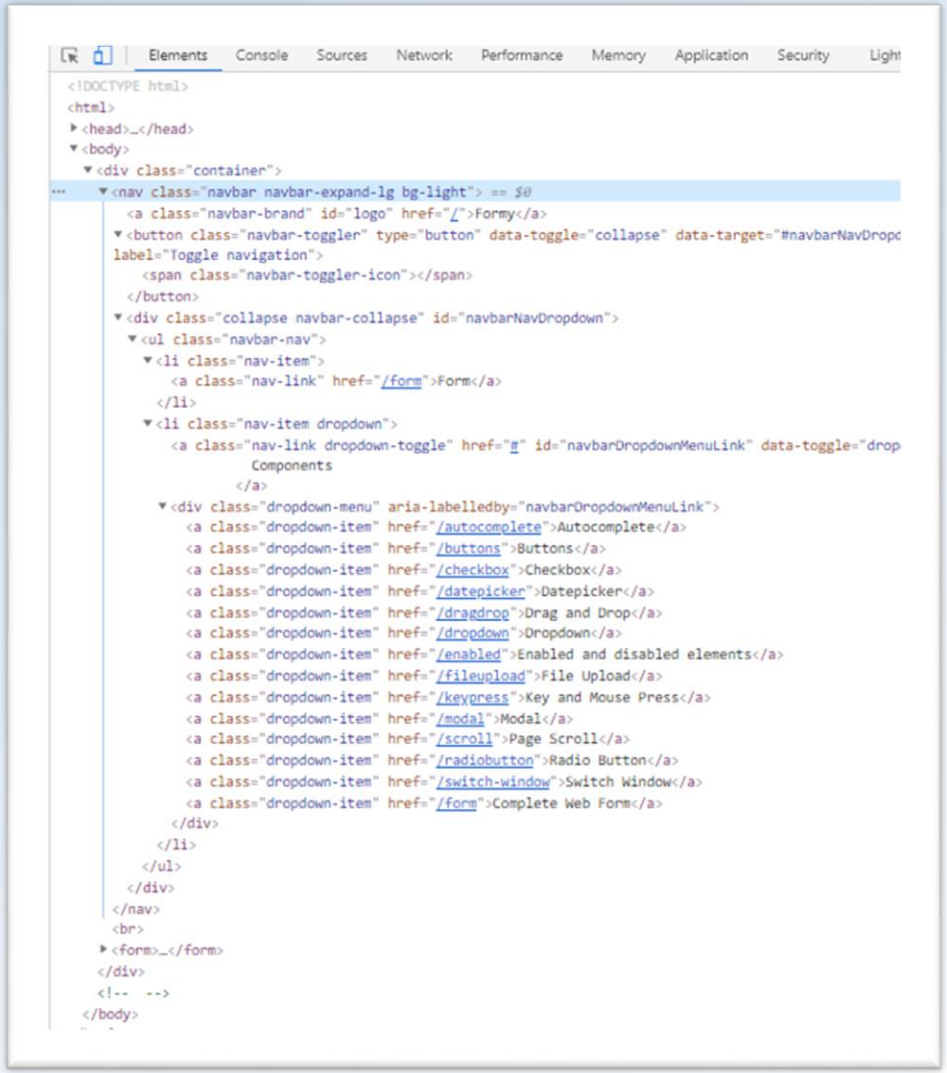
Selenium with Python – Class Activity Example

- Create a passing test case to test if Chrome browser can load a search for “python”

- Create a failing test case to test if Chrome browser can load a undefined search. E.g. “!@#$#”

Selenium with Python – Other elements

- Different ways to find element
  - find_element_by_id()
    - Uses string of id used in the html
  - find_element _by_name()
    - Uses string of name used in the html
  - find_element _by_link_text()
    - Uses the link text used in the html
  - find_element _by_partial_link_text()
    - Uses the partial link text used in the html
  - find_element _by_tag_name()
    - Ues the tag used in the html



Selenium with Python – Other elements

- find_element_by_xpath()
  - XPath is a language for xml.
  - Can use xpath in html as thou is xhtml
    - Can use the form of absolute path →"/html/body/ ....."
    - Can use the form of first element in HTML →"//element[1]"
    - Can use the form of element with ID attribute →"//element[@id = 'elementID']"
- find_element_by_css_selector()
  - Uses CSS selector syntax
  - element.subElement.subsubElement
  - Returns the first element matching CSS selector

Selenium using Pytest

Main code snippet for launching Selenium using pytest

```
from selenium import webdriver
from selenium.webdriver.common.keys import Keys
import pytest
```

- Trigger test cases as thou it was done previously in console testing using pytest.

- Test cases involve Graphical User Interface tests.

Selenium using Pytest - Pytest functions

- Verifying Exceptions
  - Uses pytest.raises(exception)
- Fixtures
  - Setup and tear down function for pytest.
  - Uses @pytest.fixture
- Parametrized tests
  - Uses a predetermined set of data to be iterated through by the test case
  - Data range testing
  - Uses @pytest.mark.parametrize("Arg#1, Arg#2 … " , [… … …])

Selenium using Pytest - Pytest functions

- Saving Screenshots
  - Allows for saving of tested screenshots at the point of test.
  - Useful for collecting evidence of test for stakeholders.
  - Uses .save_screenshot(filename)
  - Other alternatives available too.

Selenium using Pytest - Class Activity

- Refer to the website:
  - https://formy-project.herokuapp.com/

- Create Test Cases for the following
  - Buttons
  - Checkbox
  - Key and Mouse Press
  - Complete Web Form

- Run Pytest on the Test Cases created.

Summary

- Different terms and activities used during software version control in a Software Control System.
- To do software version control using GitHub
- To use Selenium to test Graphical User Interface of a webpage.
- Use Pytest with Selenium to test different test cases.

References

Electron shell 034 selenium

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Portfolio Empty

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Bitbucket Wikipedia

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Selenium with Python Documentation

- https://selenium-python.readthedocs.io/

ChromeDriver – WebDriver for Chrome

- https://chromedriver.chromium.org/getting-started

Getting Started – Selenium Python Bindings 2 Documentation

- https://selenium-python.readthedocs.io/getting-started.html#simple-usage

Formy

- https://formy-project.herokuapp.com/