COSC2299 - Software Engineering Process and Tools

Tutorial 1

Pre-Requirement

Follow the Git Essentials Course in LinkedIn Learning

Part A: Meet and Greet

Introduce yourself to your classmates and tutor.
This course has a team project. All members of your group must be in the same tutorial session.

Part B: Environment Setup

Set up Git

Please ensure your environment is ready to use git. Your tutor will guide you if you need assistance. When required, use your RMIT email account.

Set up your environment:

1) Install git in your machine
    a. You can download the client for your operating system from https://git-scm.com/
    b. Check the installation. Run in your console:

```
$ git --version
```

2) Configure git

```
git config --global user.name "[firstname lastname]"
git config --global user.email "[valid-RMIT-email]"
```

3) Create a GitHub Account
    a. Use or link your RMIT email!
    b. You will have to link your github account to the course's classroom in future tutorials.

IMPORTANT NOTE: Use ONLY console commands. Windows users must install Gitbash.

Set up Java Development Environment

1) Install JDK 17[1]
2) Install IntelliJ
3) Review the main commands and tools[2] (i.e. java, javac, Javadoc, etc

[1] https://docs.oracle.com/en/java/javase/17/
[2] https://docs.oracle.com/en/java/javase/17/tools/tools-and-command-reference.html

Set Maven

Instructions available : https://maven.apache.org/install.html
NOTE: You can use other installation process if preferred, (e.g., Homebrew)

Part C: Create a simple java program

Bubble sort[3] is a sorting algorithm that compares to adjacent elements in an array and swaps them if necessary. It will repeat this process until now more swaps can be made.

The pseudocode of the algorithm is as follows[4]:

```
procedure bubbleSort(A : list of sortable items)
    n := length(A)
        for i from 0 to N-1 do
            for j from 0 to N-i-1 do
                if a[j]>a[j+1] then
                    swap(a[j], a[j+1])
                endif
            endfor
        endfor
end procedure
```

Tasks

1) Use a maven structure for your project[5] (i.e., code directory is src/main/java/<your package(s)>/BubbleSort.java).
2) Implement the algorithm in a Class named BubbleSort.
3) Implement the bubble sort algorithm in java in a method called sort a take an array of Integers (i.e. Interger[]).
4) The method should return a sorted array.
5) Create a Class App that uses the Sort class to sort the following arrays and prints the results to the console.
    a) 70,61,72,83,38
    b) 7,2,76,4,99
    c) 28,9,13,78,19
    d) 68,84,41,62,18
    e) 37,57,40,13,50

Part D: Version Control (Basic Refresh)

We will put our sorting algorithm app under version control using git (Tutorial 1).

Tips

- As a standard practice, always use branches every time you are going to make changes to your code.
- Commit often

Resources

- Git Cheat sheet: https://education.github.com/git-cheat-sheet-education.pdf

[3] More information: https://en.wikipedia.org/wiki/Bubble_sort
[4] Small animation of the algorithm: https://www.youtube.com/watch?v=9I2oOAr2okY
[5] https://maven.apache.org/guides/introduction/introduction-to-the-standard-directory-layout.html

- A collection of useful .gitignore templates: https://github.com/github/gitignore
- Maven standard directory layout: https://maven.apache.org/guides/introduction/introduction-to-the-standard-directory-layout.html

Publish your code

Starting from the code you developed in Tutorial 1 on your machine:

1) Move to the location of your source code.
2) Initialize your local repository[6].
3) Restructure your code to follow maven's standard directory layout[7].
   a) Remember to use branches
   b) Merge everything back to main.
4) Create a repository in your GitHub account.
5) Push your code to GitHub.

Part E: Organise your Group

Team requirements

1) All members must attend the same T/L session until the end of the semester.
2) Try to have a cross functional team, this is not a one-man project and team members contribution will be monitored through the semester by your tutor.
3) Exchange contact information with your teammates
4) You will have progress check and Scrum meeting every week from next week, and you may lose individual contribution mark for being absent in the meeting.
5) Please communicate with your tutor if you have any question.
6) All enquiries about changing teams or classes must be negotiated with tutors and head tutor by sending an email and cc your tutor and the head tutor.

Make sure that you have your first group meeting with your tutor, introduce your team to your tutor, explain your team cross functional skills and discuss about your goals towards this course.

[6] Don't forget .gitignore!
[7] There are several ways to layout your source code directory. In this course we will follow Maven's structure.