S02 Revision Control

Git

ANU – School of Computing – Structured Programming 1110 / 1140 / 6710

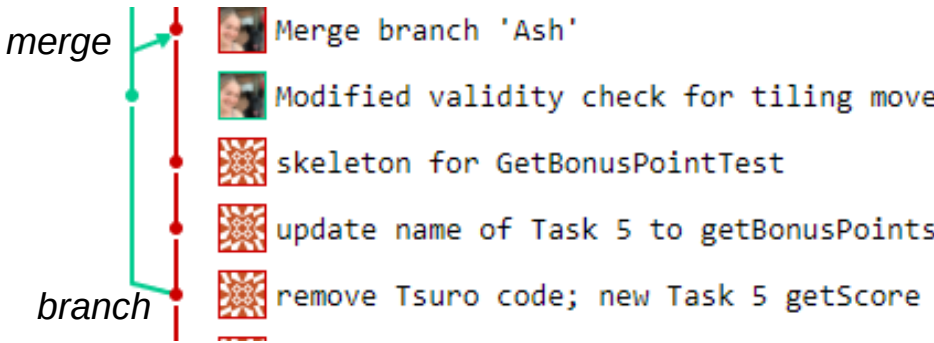
Git Concepts

- Commit (noun)
- Staging (IntelliJ allows you to more or less ignore this, so we will)
- ✔ Commit (atomically commit changes to your local repo)
- ✔ Push (push outstanding local changes to a remote repo)
- ✔ Pull (*fetch* new changes from a remote repo and merge / rebase locally)
- ✔ Update (in IntelliJ, otherwise known as checkout – update your working version)
- Merge / Rebase
- Reset and Revert

Git Commits

Captures a set of changes (e.g., modifications, additions, deletions) that may span multiple files.

- Globally unique commit ID (large hexadecimal number)
- Parent – child relationship
  - Single parent, single child is simple case
  - Multiple children indicates a **branch**
  - Multiple parents indicates a **merge**
- Commits are usually never deleted



A Little More on Update

Update will by default take you to the “HEAD” (the most recent known commit).

You can, however, “update” to any particular revision, moving yourself back and forward in time. To do this, you need to specify the revision.

In IntelliJ you can do this by double-clicking on the revision (Git -> Show Git Log, select the revision right click “Checkout revision”)

Branches and Merging

- A **branch** occurs when a commit has more than one child.
- A **merge** is special commit with two parents (thus uniting branches).
- If branches are conflicting (changes to the same file), those conflicts must be **resolved** before merging.
- You can create named branches, and jump between them with update (**checkout**).

Rollback, Reset, Revert

- You can **rollback** (checkout) uncommitted changes (to “HEAD” state).
- You can **reset** your local HEAD state to any particular commit (throwing away un-pushed changes whether committed or not).
- You can also **revert** any particular commit. This amounts to applying a counteracting commit.

Amend and Rebase

WARNING: The following commands will cause trouble if they "modify" commits that have been previously pushed:

- You can amend a commit message, add more changes with **amend**.
- You can interactively remove, combine, reorder and edit commits with **rebase** *interactive*.

When All Else Fails

https://xkcd.com/1597/