CMPT 276 Class 08: Git Branches and Workflows

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Today's Topics

- Two more advanced Git features:
  - Using **Issues** to track features and bugs.
  - Using **Branches** to work on those features and bugs.

Issues In GitLab

- GitLab tracks **Issues**:
  - Bug reports and feature requests
- Value of Issues
  - Use as product’s **backlog**
  - Assign issues to a dev to show who's working on it
  - Update issues with extra info as needed

Branches

- **Master**: Main source code branch in a Git repo.
- **Head**: Latest code on master.
- Too chaotic to have many teammates constantly committing code to master.
  - **Solution**: Create feature branches
- **Branch**
  - Do work on a separate track (the branch) from the Master
  - Commit changes to your branch
  - When the feature is ready, merge the branch back to the Master

Issue and Branching Overview

***GL** = done in GitLab*

***AS** = done in Android Studio*

- **GL**: Pick an issue to implement & create branch.
- **AS**: Checkout branch, make changes, commit & push changes to the branch.

When feature is ready:

- **AS**: Merge Master to Feature branch (resolving conflicts); commit/push changes.
- **GL**: Create merge request to merge branch to Master.
- **GL**: Branch is deleted when merge request accepted. (manually remove merged local branch)

Issues and Branching

1. **Create an issue** for a bug or feature
   - Implementing a feature or fixing a bug should start with a GitLab issue.
   - Ex: Issue 14: "Add help button to game activity"
2. **Assign the issue** to yourself

Issues and Branching

3. **Create a feature branch** in GitLab
   - GitLab names the branch to start with the issue number.
   - Ex: 14-game-help-button
   - In Android Studio:
     a) **Fetch** to get new branch names: VCS -> Git -> Fetch
     b) **Checkout** the branch: Bottom-right “Git” button. Under remote branches, select your new one. On sub-menu, select checkout
   - Your work goes into the branch, not the master.

Issues and Branching

4. **Work** on your branch
   - Do your work changing files
   - Check-in your changes via Git:
     - Add: changes ready to be committed
     - Commit: put changes into local repo on branch
     - Push: push to remote repo on branch

Issues and Branching

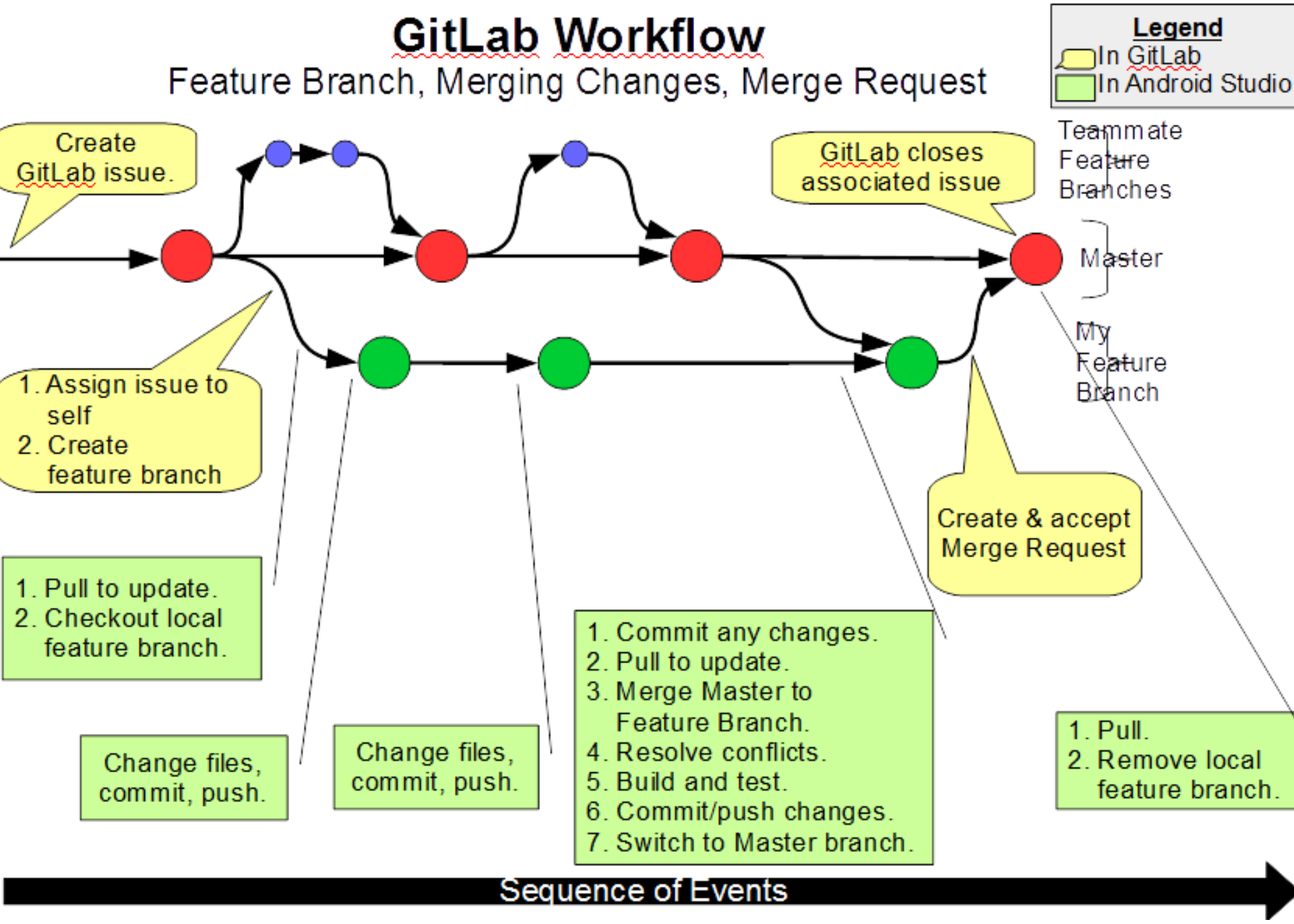
5. **Merge** Master to Feature Branch
   - Get latest from master's HEAD
   - In Android Studio: VCS --> Git --> Merge Changes...
   - Resolve merge conflicts; test, add/commit/push any changes.
6. Submit a **Merge Request** via GitLab
   - Create request to merge your branch back to master
   - Since you already merged Master to Feature Branch, there should be no conflicts.
   - GitLab will close issues associate with merge request; Otherwise, have message include "Fix #14"

Managing Merge Requests

- Team members see merge requests
  - **Code review**: Comment on problems they see in the code (possibly leading to new commits to fix)
  - Thumbs-up/down for voting
- **Repo Manager** accepts the merge request
  - Accepting merge requests will:
    - Merge code to master (should be no conflicts)
    - Closes associated issue (if any)
    - Delete the source branch [optional; good practice to clean up]

GitLab Workflow

Feature Branch, Merging Changes, Merge Request



Recap – Merge Requested

- **Branches and Workflow**
  - Create GitLab issues.
  - Do work on a feature branch.
  - GitLab merge request to merge branch to master.