GDBS/SVBS Midterm Project Overview

Goal

- These courses are designed to familiarize students with the development process by implementing and completing a multiple month game project as a team.

Who are we

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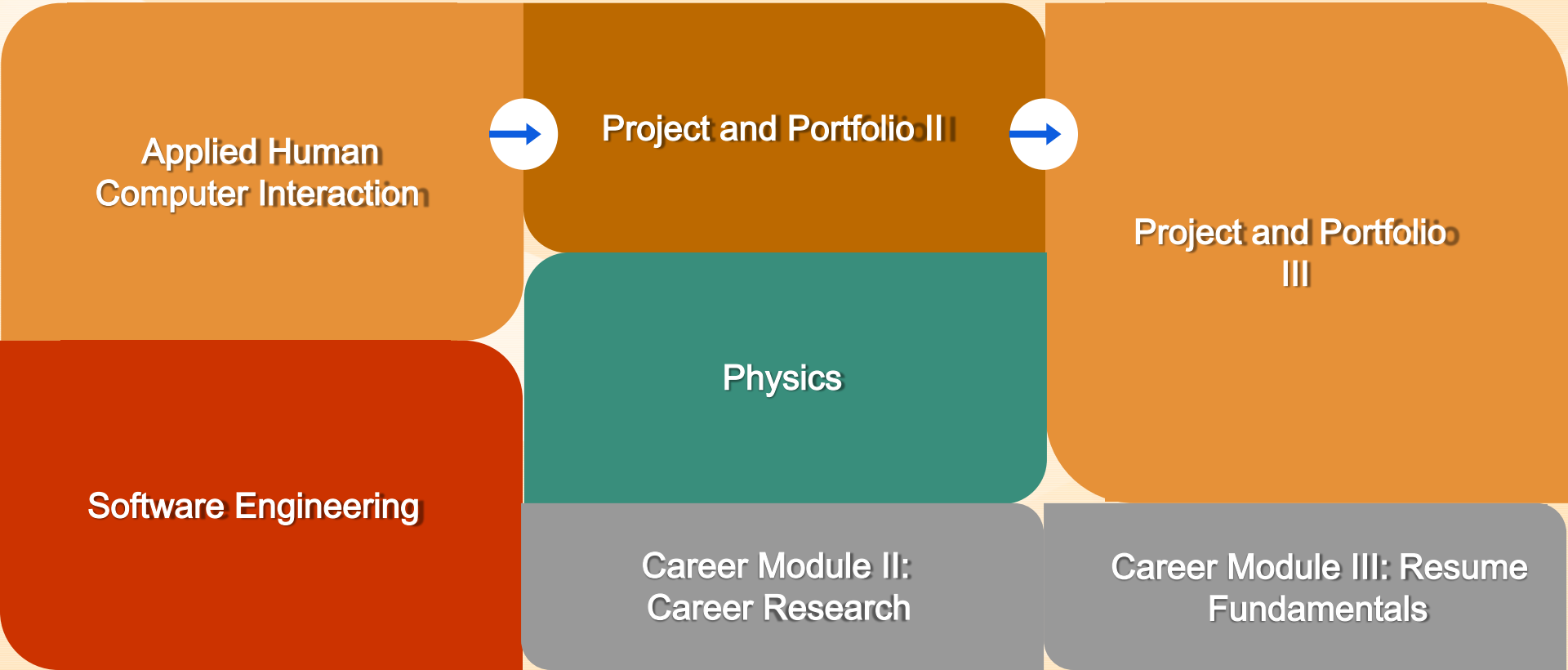
Full Midterm Project Process



Full Midterm Project Process

Applied Human Computer Interaction

- Pre-Production
  - Design Document
  - Product Backlog
- AHI Topics
  - Nielsen's heuristics
  - Usability
  - UX
  - UI
  - Emerging tech

Project and Portfolio II

- Core Functionality
  - Critical game systems
  - Interface and UI creation
- First Use/Playable
  - Playable complete Experience
  - Fun factor

Project and Portfolio III

- Alpha
  - Full Functionality
- Beta
  - Content complete
  - Balancing
- Finalizing
  - QA process
  - Presentation

Project Expectations

Game Expectations - Scope

- Medium/Indy scoped game
- Gamesimilar to game from NES, SNES/Genesis era, or mobile and web platforms game tend to work best
- Focus on functionality over assets

Game Expectations - Minimums

- All games must have at least 15 minutes of engaging and varied play
  - Most have far more than 15
- Must contain at least one single player mode
  - To ensurethe game can be easily demoed

Game Expectations - Platform Support

- Must support a secondary platform
  - WebGL version exported to a webpage
    or published to a web portal
    or
  - Playable on an android device (tablet or phone)

- Keep platforms in mind when making design and production choices

- Keep file size low
  - < 1GB
  - Under 512 MB preferred

Game Expectations - Buildable

Design a game with your capabilities in mind

- Heavily story driven game
  - Someone one the team should be a writer
- Aesthetic as a hook (unique art styles)
  - Someone on the team should be able you source those assets
- 3D Animation heavy game
  - Someone on the team should be able to animate
- Game with 50 unique levels
  - Someone on the team should have the skills of a level designer

Game Expectations - Expo

- Games will be presented at the FPS Expo
- First Thursday of the month after PP3
  - 11am-1pm

Developer Expectations

Expectations: Problem Solving

Put less importance on knowing things ahead of time.

- The job IS problem solving
  - On the job, you learn things just-in-time.
  - You must be able to figure out solutions on your own.
  - Unity Documentation is surprisingly good
- It’s not memorization and regurgitation. It is finding a way that works from multiple possible solutions

Expectations: Communication

Communication will be a challenge

- Mandatory schedule
  - CDs will see you 1 or 2 times a week
  - That isn't enough to keep communication open
- Stay connected with us
  - If something breaks, tell us
  - If there are issues with finding art, tell us
  - If something awesome changes in the project, tell us

Expectations: Teamwork

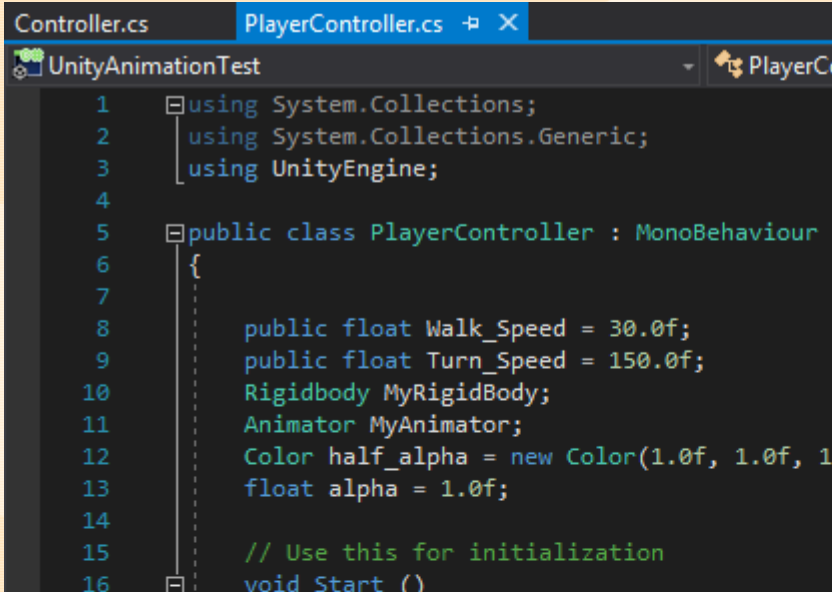
Work with each other

- Have a set schedule
  - Check in daily
  - Set a schedule for everyone to work TOGETHER
  - You will always get more done as a group

Expectations: Be a developer

We will be doing a lot of different jobs

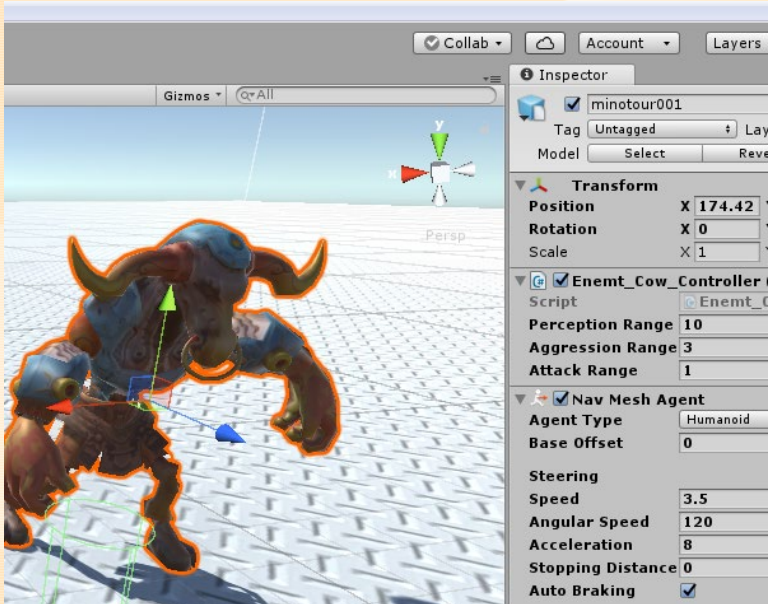
- Programmer
  - Creating functionality
  - Researching the engine
  - Fixing bugs



Expectations: Be a developer

We will be doing a lot of different jobs

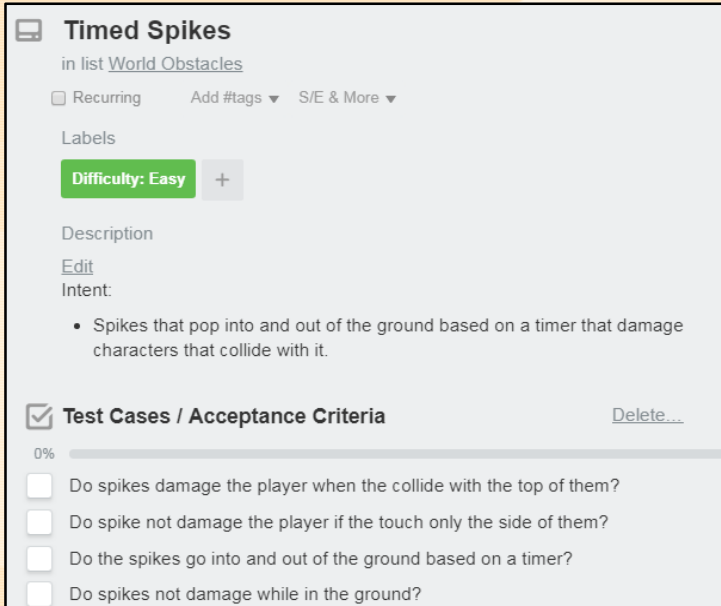
- Designer
  - Defining mechanics
  - Level designs
  - Scripting Interactions
  - Balancing



Expectations: Be a developer

We will be doing a lot of different jobs

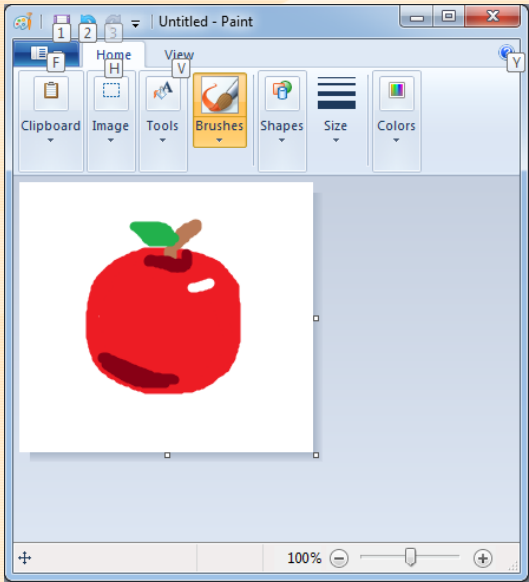
- Producer
  - Defining expectations
  - Writing and following a Scheduling



Expectations: Be a developer

We will be doing a lot of different jobs

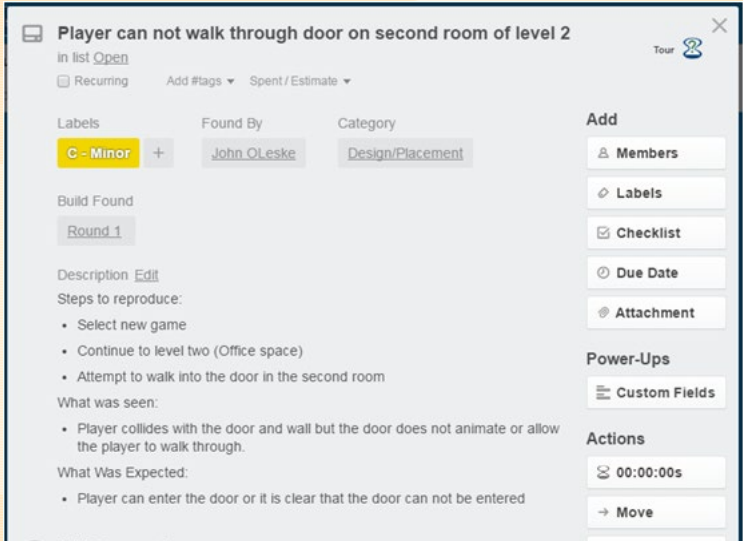
- Artist
  - Adding assets to product
  - Setting up animations
  - Creating simple assets (programmer art, placeholders)



Expectations: Be a developer

We will be doing a lot of different jobs

- Quality Assurance Tester
  - Testing and reporting bug



Project Policies

Academic honesty

"Projects/Assignments: Students are expected to be honest and produce their own projects/assignments according to the specifications of their Course Director. **They must work solely on their projects/assignments unless otherwise noted by this Course Director.** Work submitted by our students is assumed to be a student's own thoughts, idea, and words. Discovery of the contrary will result in immediate consequences. **For group projects, all students whose names are submitted with the project are responsible for the content and will be subject to disciplinary action should plagiarism be discovered.**"

- Student Manual, page 17

Academic honesty: Midterm Specifics

- Code/Functionality
- All functionality in the final product must be created by a student team member
- Any functionality not included in the unity installation must be authored by a student team member
  - Scripts
  - Prefabs
  - Scenes
  - If it can be made in unity you are expected to make it
- You may not use the unity asset store to add functionality to the project

Academic honesty: Midterm Specifics

- Assets
- Assets authored by non-student team members may be used as long as there are legal rights to use the assets
  - Textures/sprites
  - Audio/sfx/music
  - Models/meshes
  - Animations
- Any assets used that was not created by a student team member must be have their source credited in the game's credits

Academic honesty: Levels

- Level 1 (0 score on the assignment and month's professionalism, conduct probation, and suspension):
  - Directly copying work from another source and submitting 1 it as one's own.
  - Submitting work completed by another individual or student as one's own.
  - …
- Level 2 (0 score on the assignment and month's professionalism, and conduct probation):
  - Completing any work for another student that fulfills an academic requirement.
  - Knowingly furnishing false information to an instructor or any other representative of the University.
  - Repeated violations that fall under the Levels 3 or 4 headings.
- Level 3 (0 score on the assignment and month's professionalism):
  - Submitting work that was turned in from another course or a previous attempt at this course without prior approval from the course instructor.
  - Significant omission or misuse of citation and/or references in course work.
  - In group work, including one's name to "tag along" on work of other team members in which he/she did not significantly contribute.
- Level 4 (0 score on the month's professionalism):
  - In group work, allowing a team member to include his/her name to "tag along" on the work of other team members despite having not significantly contributed to that work.

Academic honesty

If you are unsure, ask

- There can be some grey areas with this as time goes on.
- If an item is in question, bring it up to staff

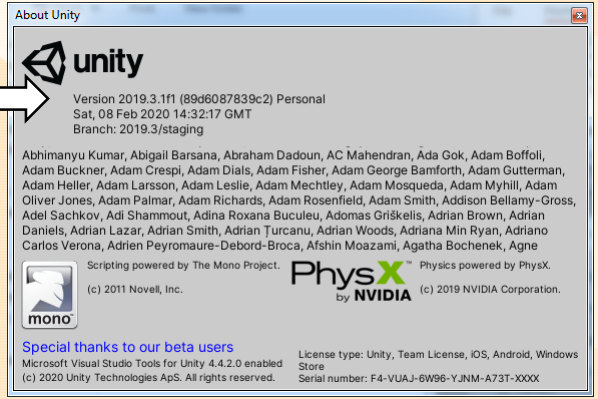
Tools

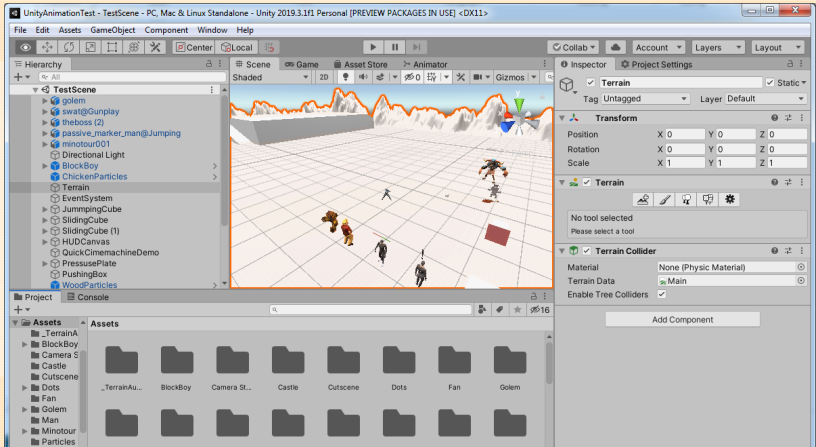
Unity3D

Unity3d.com

- Our dev environment
- Scripting in C#

- Ensure each team member is using the same version

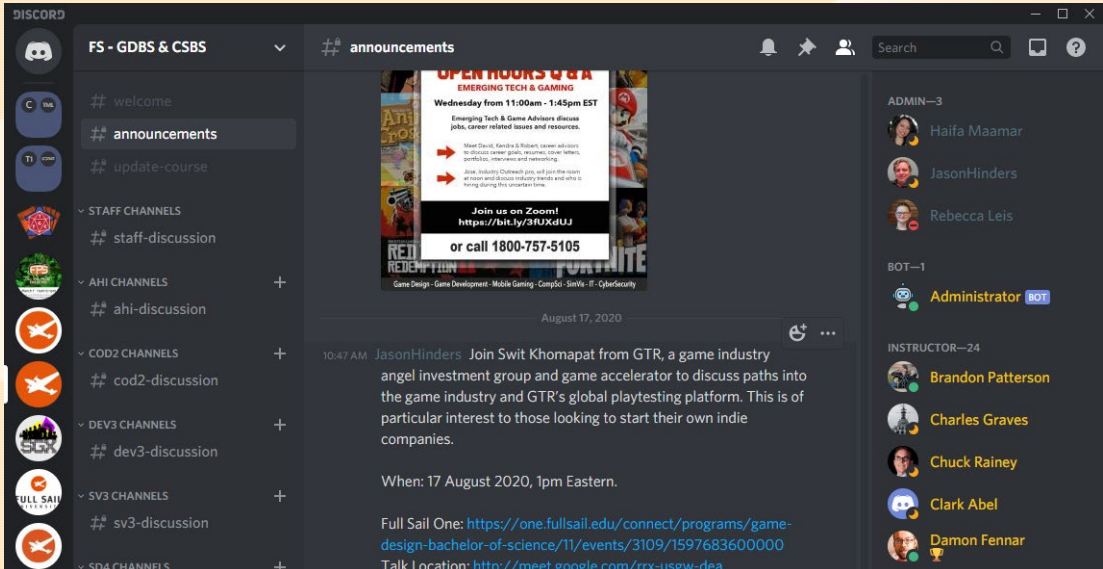




Discord

discordapp.com

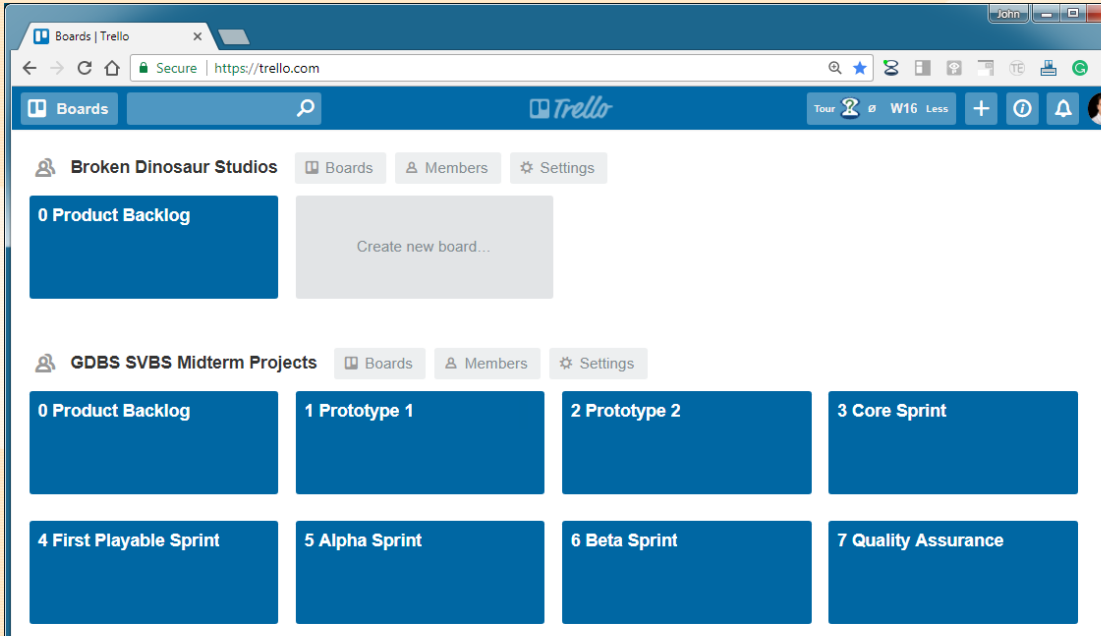
- Keep communication open while working remotely
- Share files that are not part of the project



Trello

trello.com

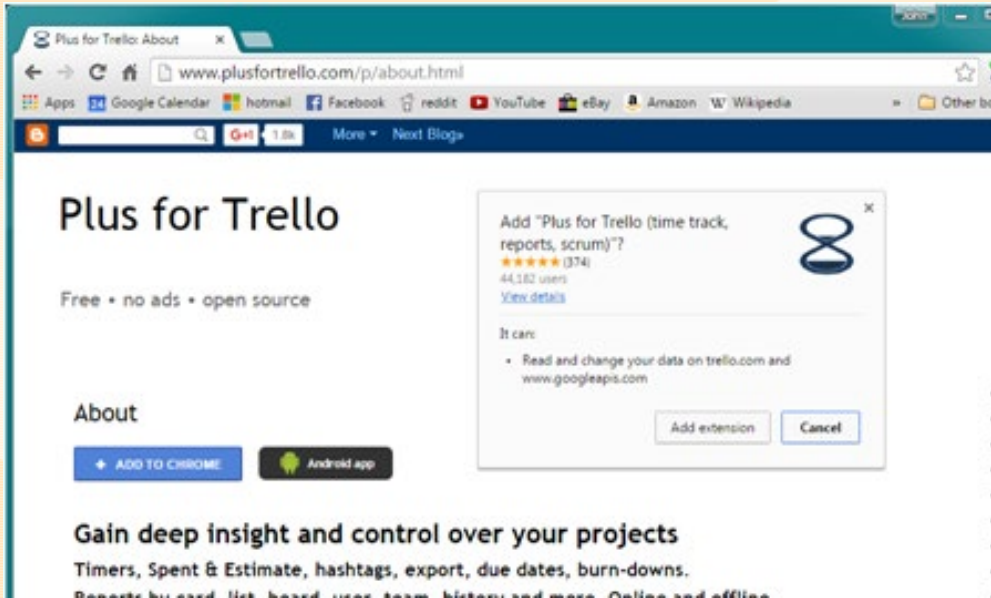
- Part of our design space
- Our task management system



Plus for trello (Chrome plugin)

plusfortrello.com

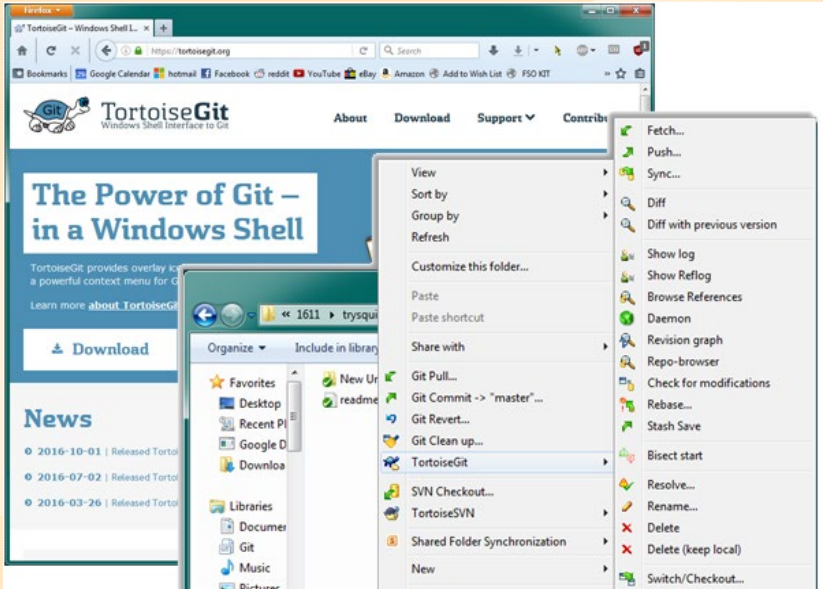
- Task ownership
- Task hour tracking



TortoiseGit

tortoisegit.org

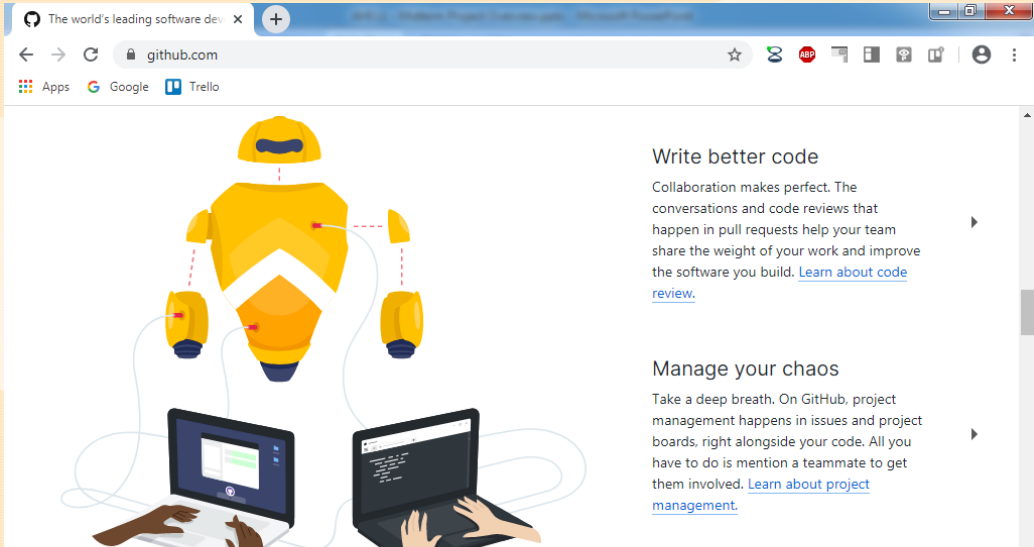
- Our Git versioning client



Git Hub

github.com

- Git server will be provided through GitHub



Git LFS

git-lfs.github.com

- Allows github to receive large sized files
- Larger than 50MB (github max file file)
- (Zipped milestones, Video files, Resource packages …)

Install, Create Accounts, or Confirm

- Unity
  (unity3d.com)
  Everyone on same version
- TortoiseGit
  (tortoisegit.org)
- Git framework
  (git-scm.com)
- Git LFS
  (git-lfs.github.com)
- Discord
  (discordapp.com)
- Trello
  (trello.com)
  Accounts created
- Chrome
  (google.com/chrome)
- Plus for trello plugin
  (plusfortrello.com)
  Sync method set to “Recommended- Store inside Trello (S/E Trello card comments)”
- Github
  Accounts confirmed

<Activity> Form Teams

Form team

- 3-5 students per team
- Will be working with each other for months

Collect the info

- Team
  - Team name
  - Discord channel
- For each team member
  - Full name
  - Trello username
    - (The one in the parenthesis next to your full name on the webpage)
  - Github username
  - Discord username
  - Email

<Activity> Discuss game ideas

I will be setting up servers and documents for all of the teams

Think of a game

- Discuss as a team what kind of game you would like to develop

<Activity> Discuss game ideas

Form a basic game elevator pitch for your game

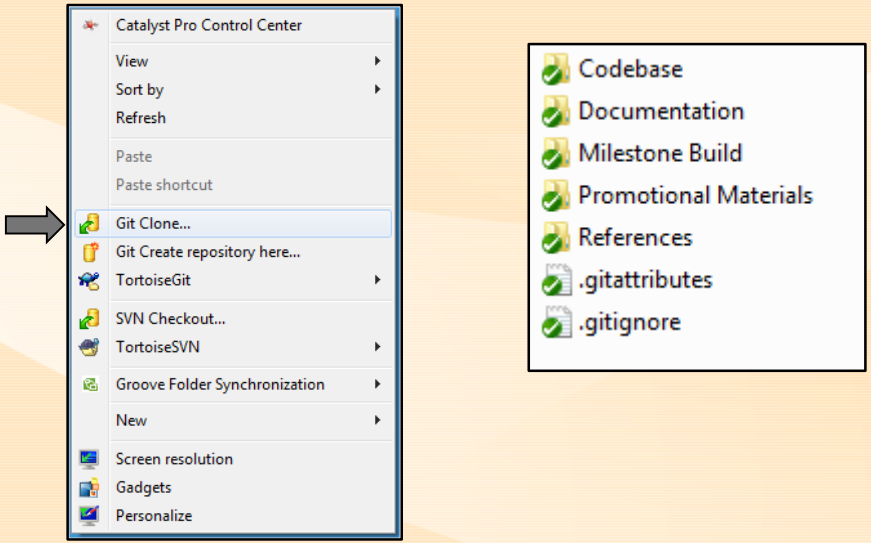
- The game's elevator pitch.
  - A one or two sentence description of the game.
  - This should encapsulate the hook of the game.
  - Why would someone want to buy and play this game over other games?
  - Why should a company be willing to invest in making this product?
- [Name] is [genre] in [setting] where player [plays as/action] to [win condition] using/experiencing [hook]

Clone The Repo

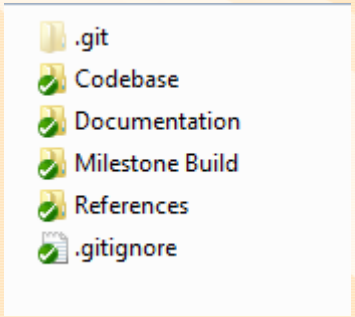
<Activity> Clone the project folder

Clone the repo

- After the clone the project folder should look like this



<Activity> Let's explore the files



- .Git
  - The hidden folder containing the local repo
- Codebase
  - Your unity project
- Documentation
  - Preproduction and production documents to be filled out
- Milestone Build
  - A single most recent good build of the game
- References
  - Lecture power points, rubrics, FAQs, Project archives, Asset Sources
- .gitignore
  - The file that defines what should not be pushed to the repo

Pre-Production

The purpose of Preproduction

- Pre-production
  - Make decisions on the product
  - Prove the validity of those decisions with rapid iteration of prototypes
  - Throw out what doesn't work and keep what does
  - Document the full scope based on the above

- Production
  - Make the rest of game based on the above

The purpose of Preproduction

- As hard as preproduction is, production is much harder without it
  - And more expensive in the long run
- Fixing problems on paper takes less time and resources than implementing the system to see it doesn’t work.

Top-Down Versus Bottom -up

- Top down
  - Starting at the big picture and breaking down into smaller and smaller components
  - What do we want? Now how can we make that happen?
- Bottom Up
  - Defining the components and integrating and combining to get to a bigger picture
  - What can we do? Now what can we make with that?
- Important to look at the game from both points of view

Trello

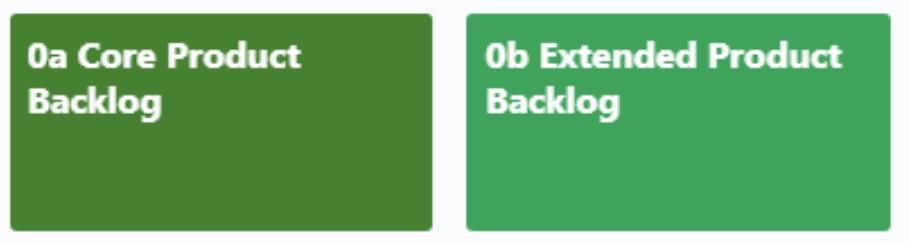
Our task management platform

Trello: Our task management platform

- Bottom-up design
  - Defining the individual aspects of the productwe intend to create to get to a whole picture
- Brainstorm features
- Create new card on trello for each feature to be added to the game
  - Player action
  - Character
  - Enemy type
  - Item
  - Weapon
  - Power up
  - Game mode
  - …

Trello: Our task management platform

Our team's Trello boards



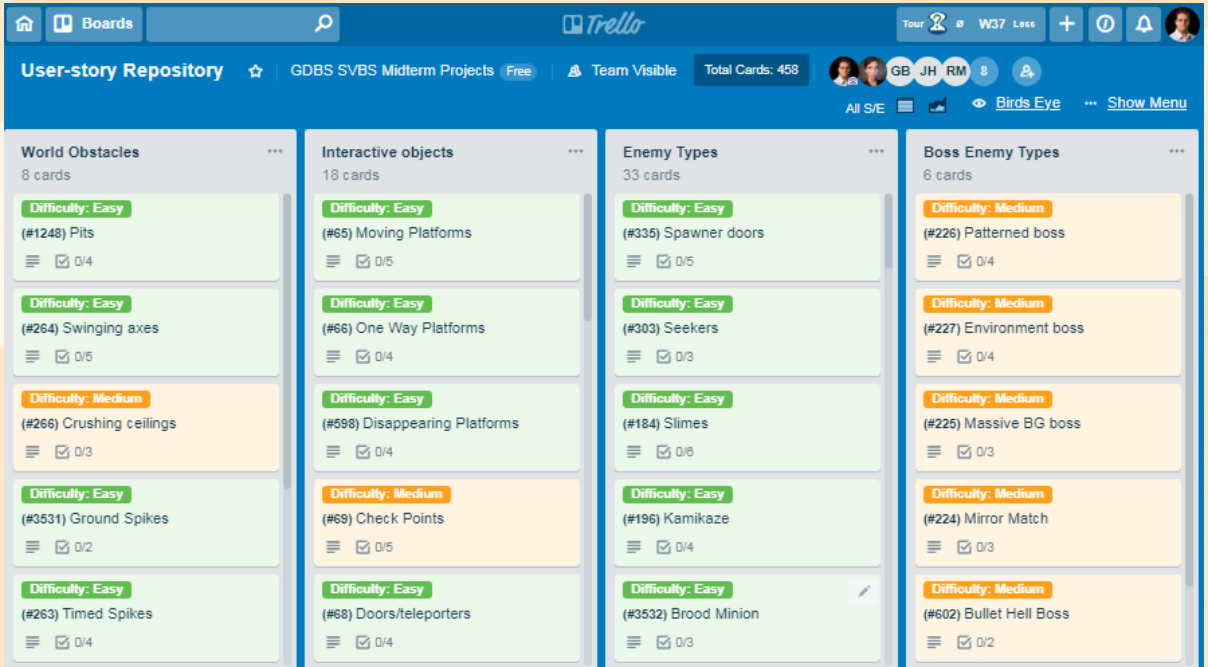
- "0a Core Product Backlog"
  - All items and features required to create the product's vertical slice
  - M.V.P. Minimum viable product

- "0b Extended Product Backlog"
  - All the wish list, would be cool to have, stretch goals… of the product

Trello

By lecture 2 our trello boards should look something like this

- Shoot for 100-150 items/features across the 2 boards



The Design Document

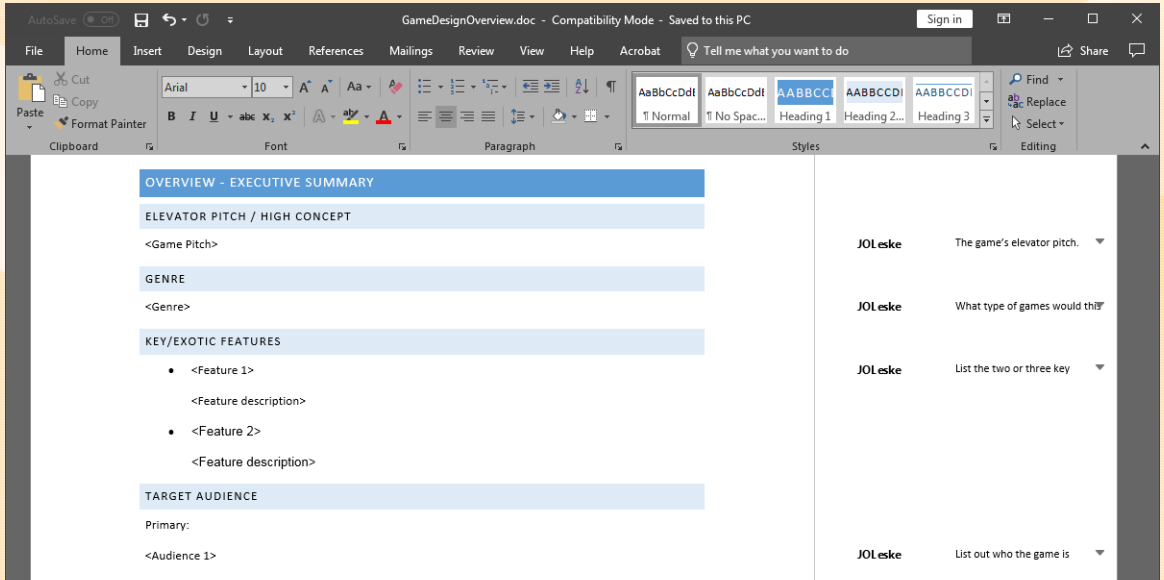
Design Document

- Top-down design
  - Defining the intent of the product as a whole and breaking that down into its aspects

- Agree on the core design
  - Overall goals
  - Fun Factor
  - Selling points of the game
  - Overarching systems and mechanics

Design Document

- Template document has been provided for you
  - In your repository's documentation folder
  - This absolutely must be customized for the game you are making
    - All games are different
    - Must describe the aspects of the game you are making

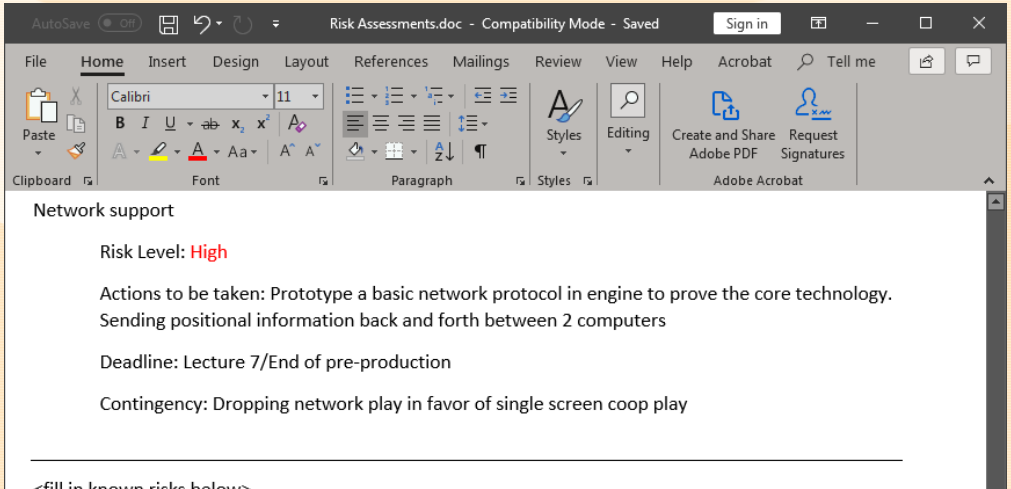


Risk Assessments

Risk Assessments

- All known risks identified on the project
  - How dangerous the risk is to the overall project plan
  - What actions must be taken to mitigate the risk
  - Deadline for those actions
  - Contingency plan

- Template document has been provided for you.
  - In your repository's documentation folder



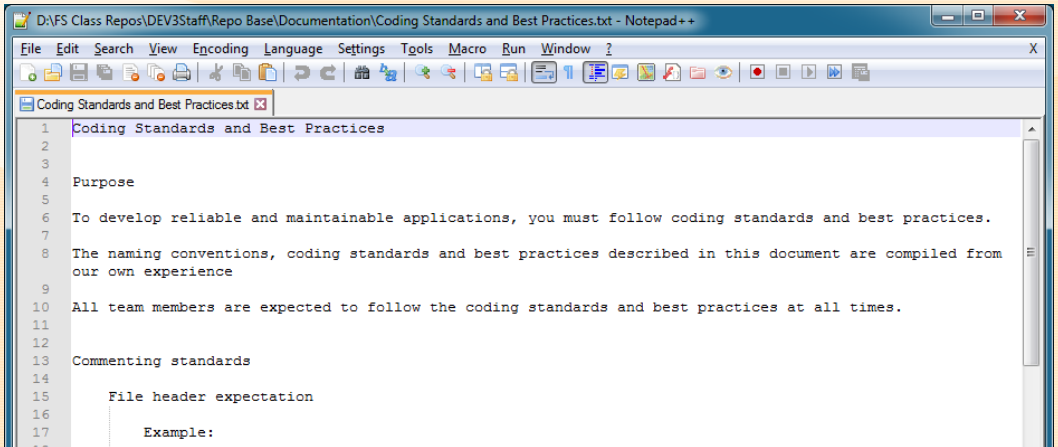
Coding Standards and Best Practices

Coding Standards and Best Practices

The team agreed to a standard

- Commenting
- Naming conventions
- File Formatting
- Indentation and Spacing
- General Programming practices

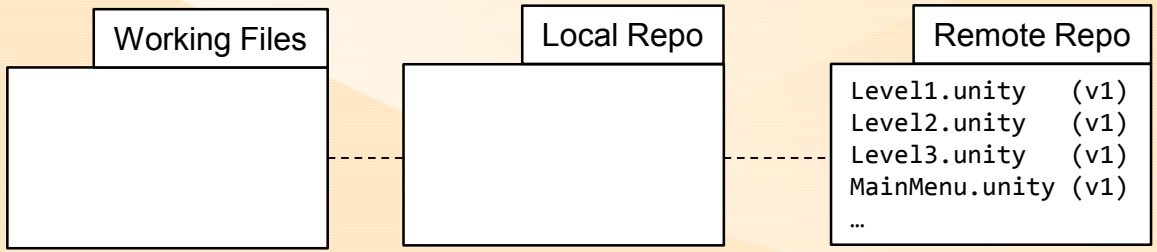
- Template document has been provided for you.
  - In your repository's documentation folder



Version Control

Git Basics

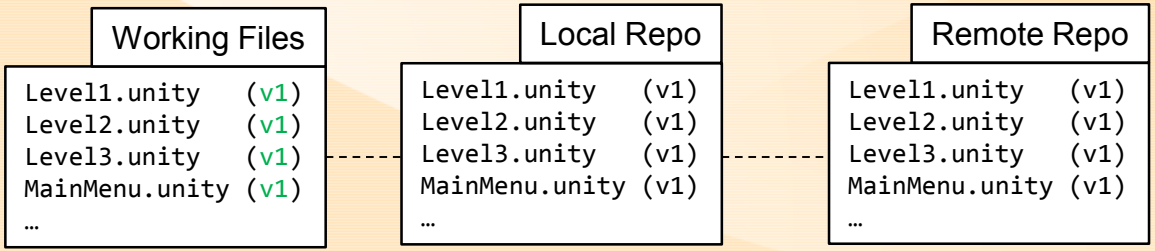
- Understand the system behind the interface
  - Three main sections to pay attention to
    - Working files
    - Local Repository
    - Remote repository
    - (actually 4 with the staging phase but that mostly handles itself)



Clone

Contributors need to clone the repository to start working on the shared files.

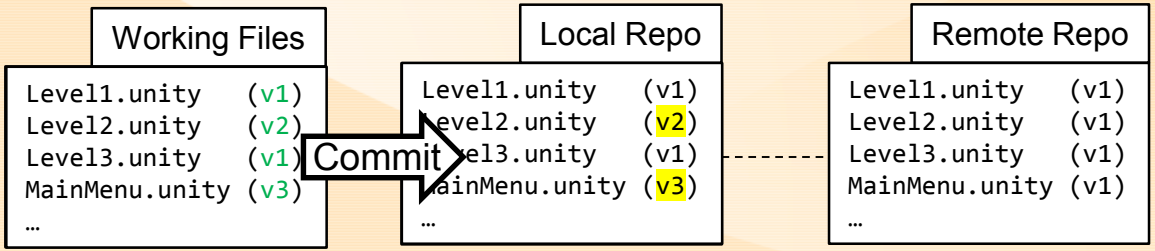
- Get a bring remote repository into the local repository
- Populate working files from local repository



Commit

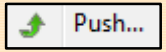
Once changes to the files has been made that work need to be committed

- Commit saves the changes to the local repository
- Once committed there is a timestamp of the files that can always be returned to

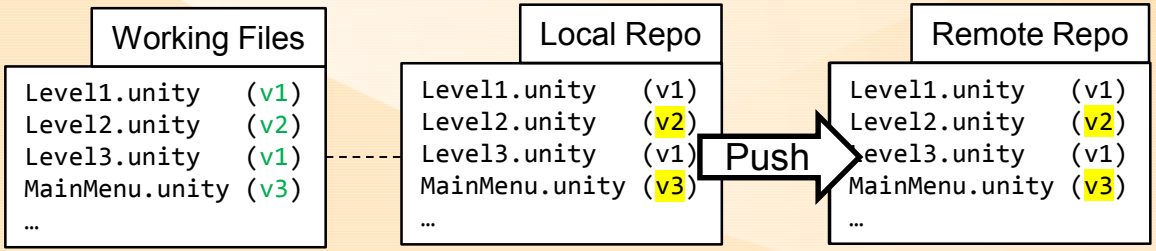


Push

Push integrate changes onto the remote repository



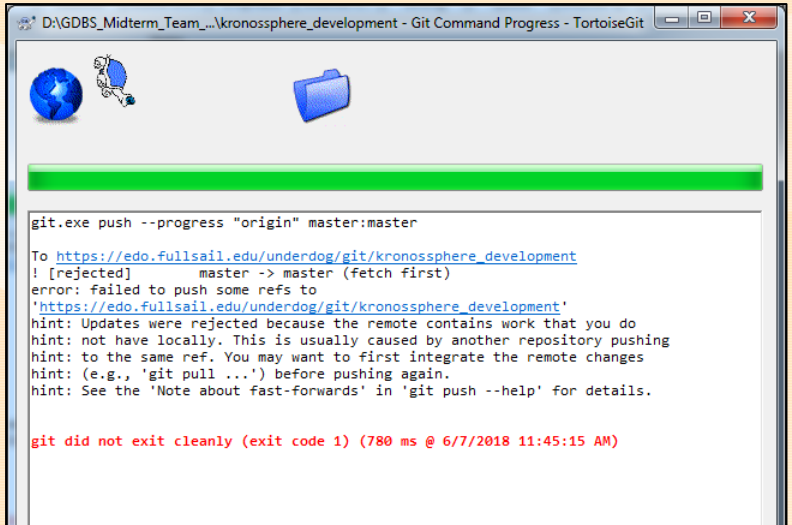
- Non committed work does not get pushed
- If a file hasn't been added it doesn't get committed



Push: Changes on remote error

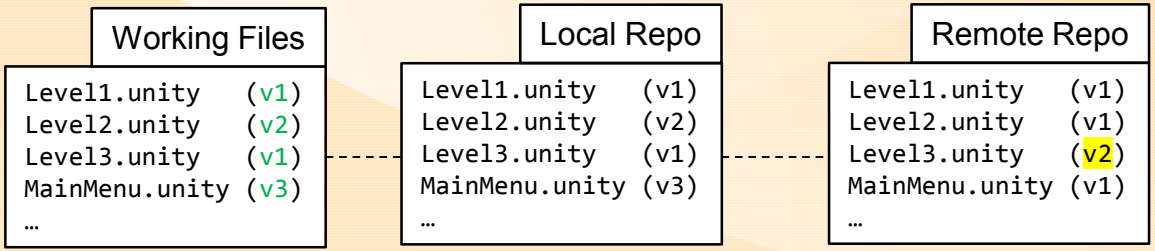
“error: failed to push some refs to…
hint: updates were rejected because the remote contains work that you do not have locally”

(Readall of the error message, not just the red text)



Push

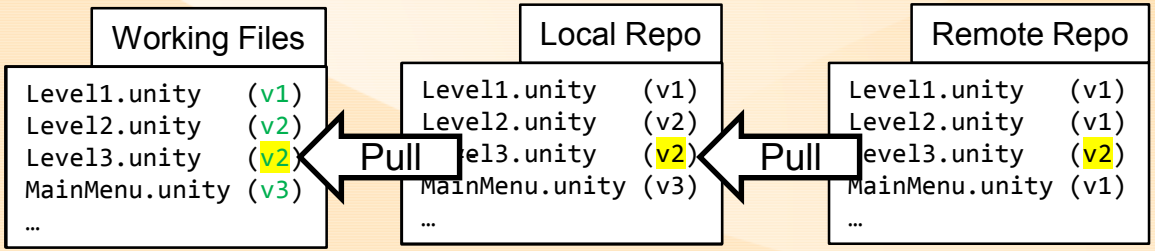
You can’t push if there are changes on the remote server that you do not have on your local repo



Pull

Pull changes from the remote and integrate them onto your build

- Changes get integrated into the local repo
- If integration is good the working files change to match



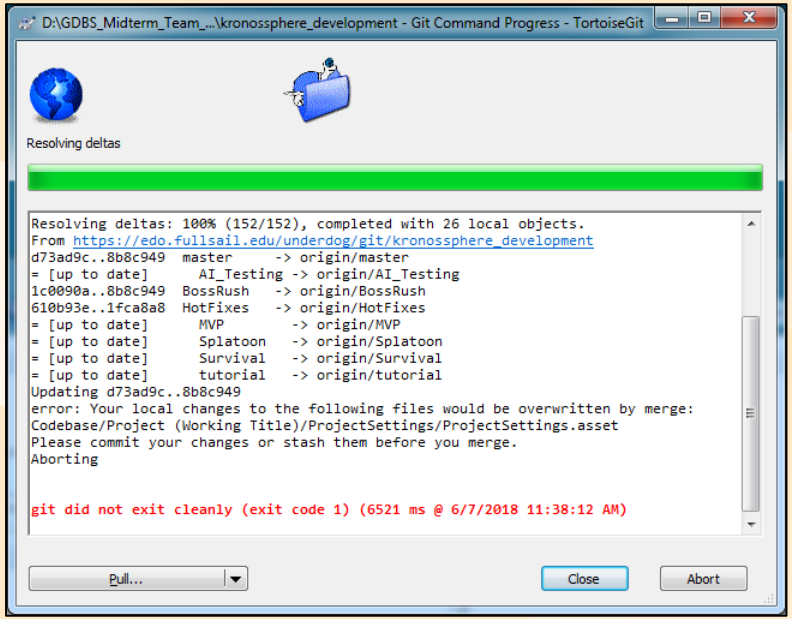
Pull

Do not pull with unity open

- Unity is always updating and recompiling based on changes in the files
- If you pull with unity open unity and there is an error unity will attempt to recompile with the error and break

Pull: Uncommitted work error

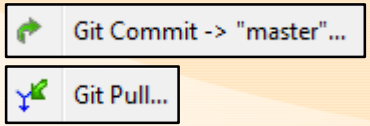
“error: Your local changes to the following files would be overwritten by merge… please commit your changes or stash them before you merge.”

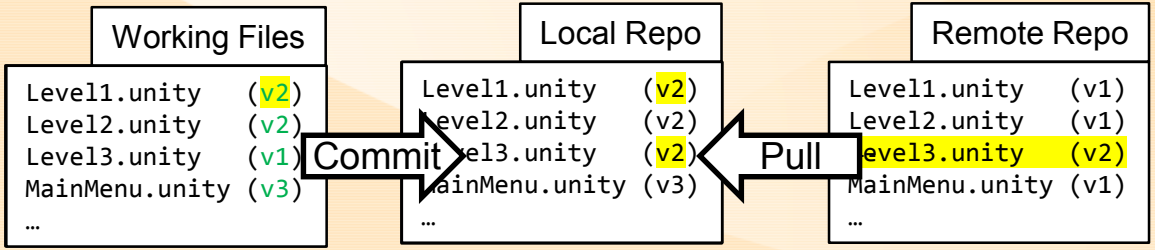


Uncommitted work error

Resolution

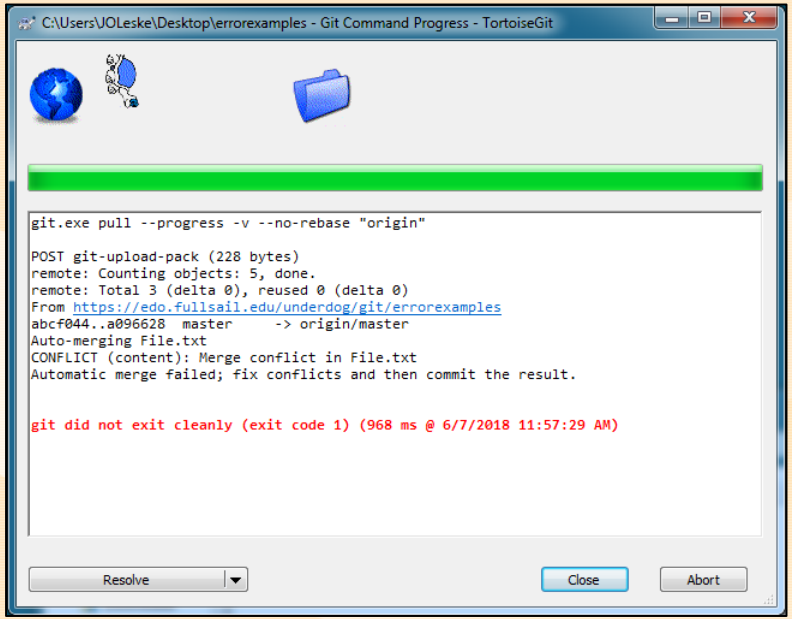
- You have changes to your working files that have not been committed
- Once you commit your changes you can pull and get the remote changes





Conflict

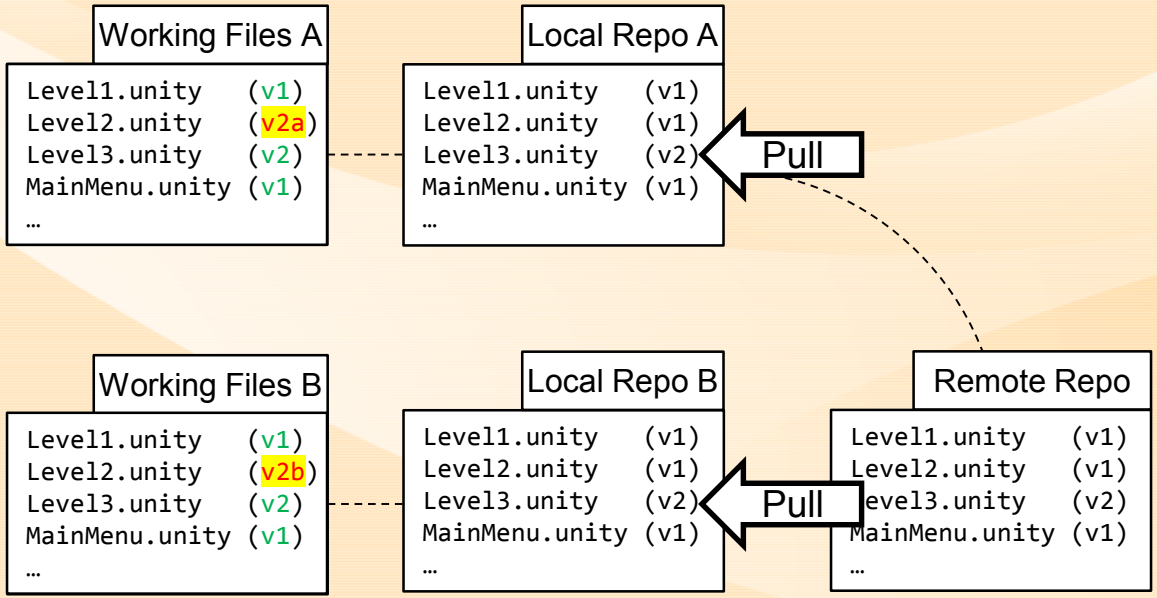
"Automatic merge failed: fix conflicts and then commit the results"



Conflict

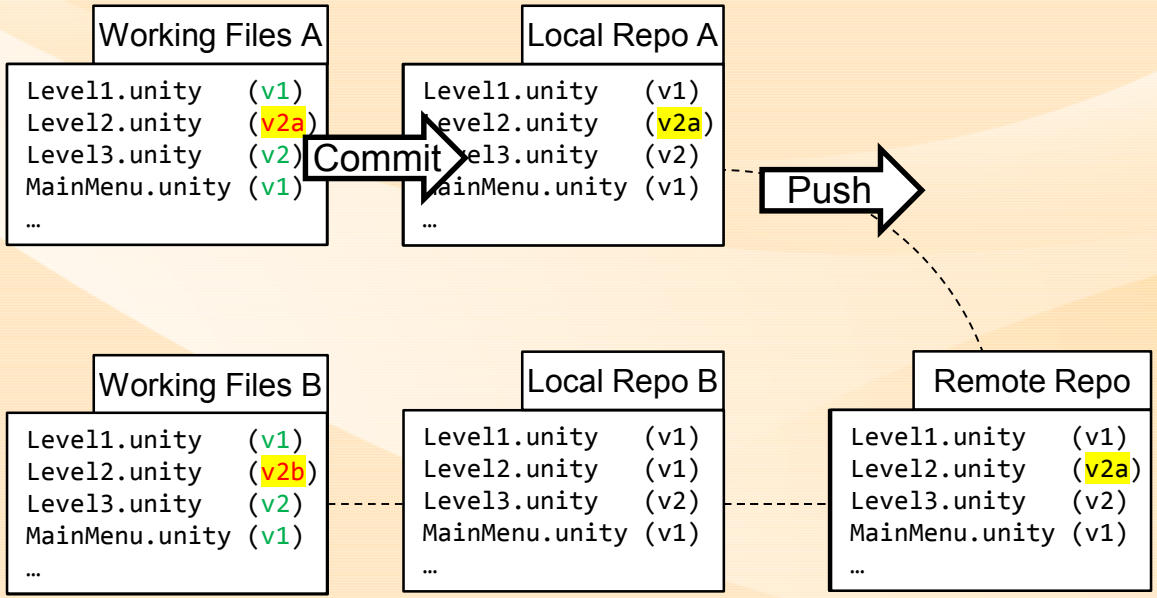
Conflicts are created when 2 pull and then modify the same file

These two Devs already have a conflict though they don't necessarily know it



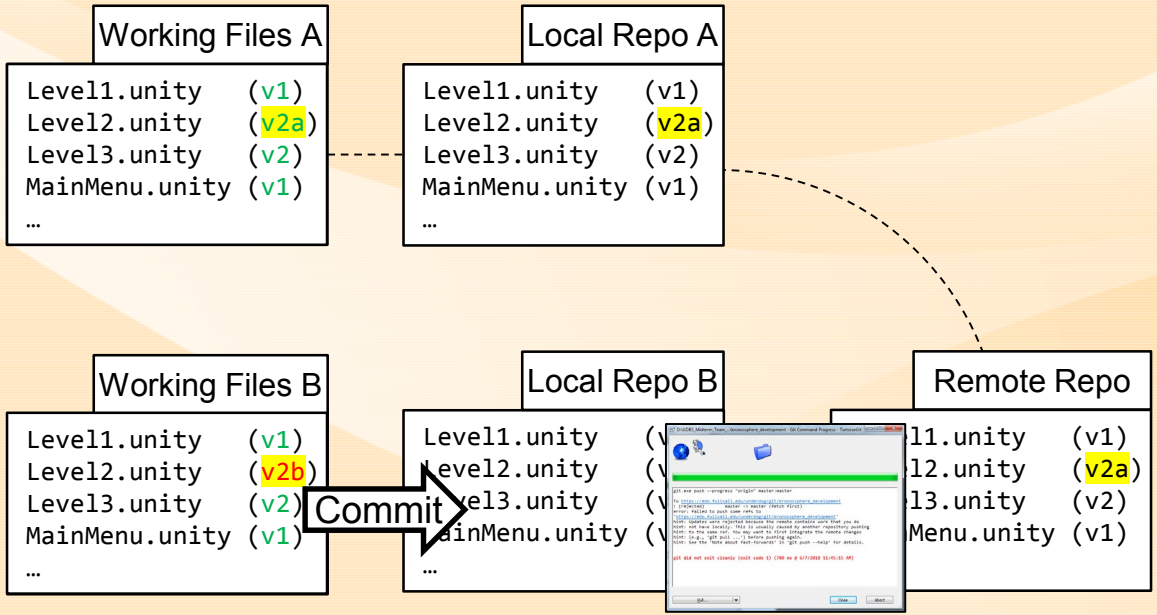
Conflict

The first dev will be able to commit and push with no error



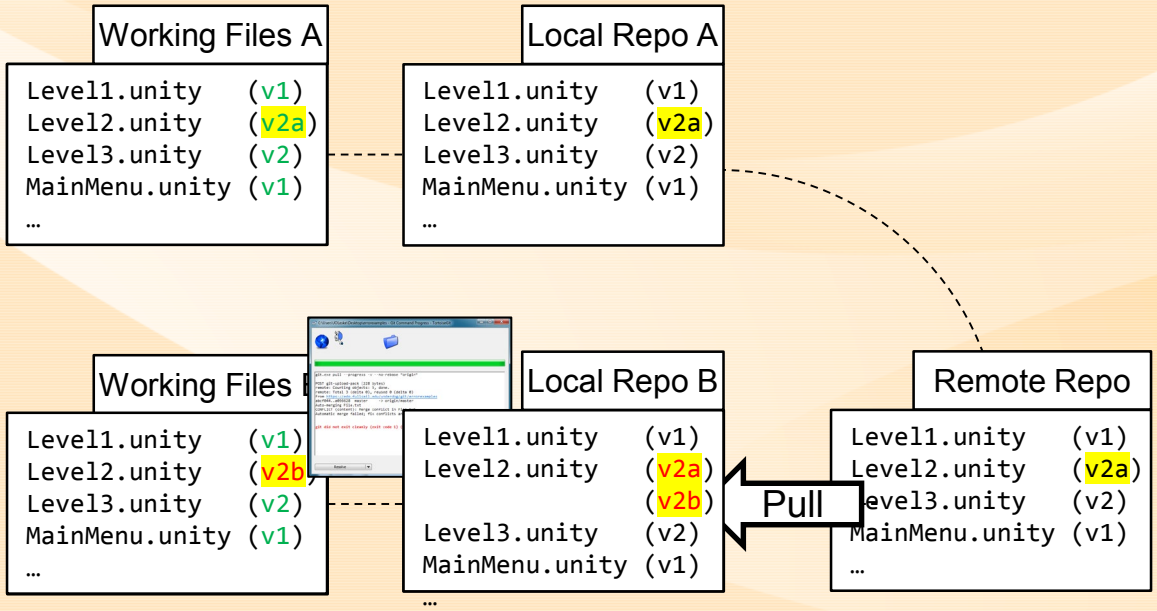
Conflict

The second dev will be able to commit but will be blocked aby the "remote contains work that you do not have" error



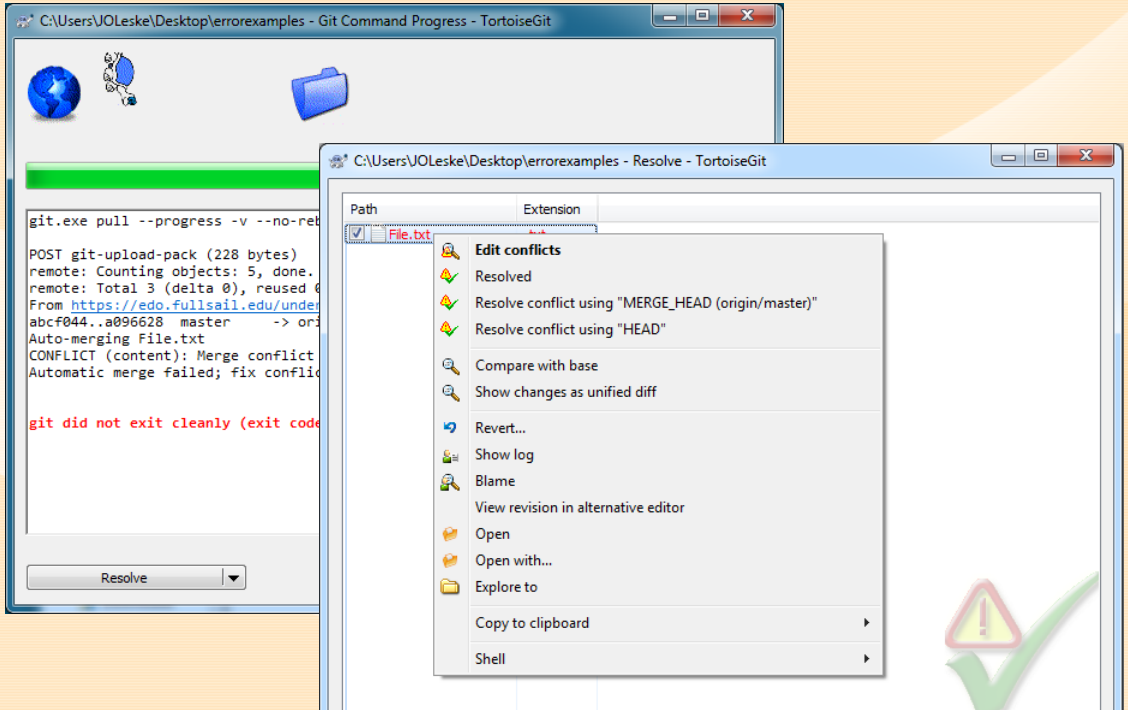
Conflict

When the second dev pulls to fix the first error they will then get the "`conflict`" error because git doesn't know what to do with the changes from DevA and DevB since the both changes the same file



Conflict

There are 4 main options to resolve a conflicted file

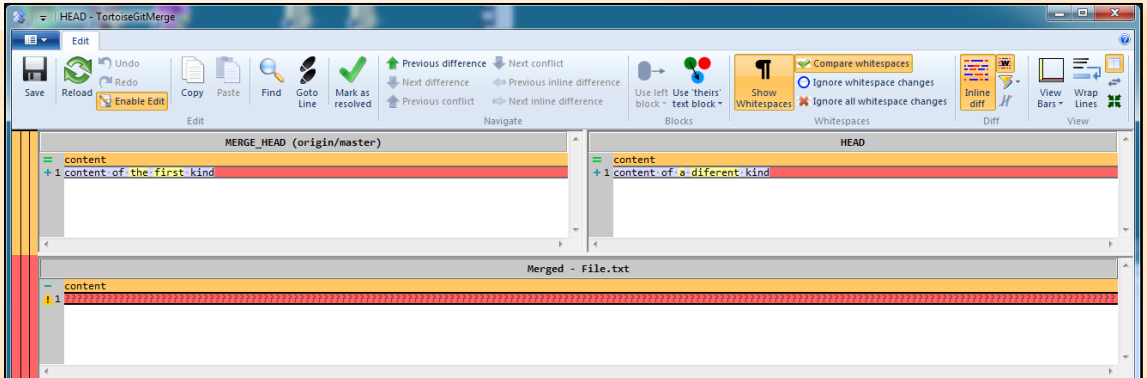


Conflict: Resolution

Edit Conflicts

- A merge tool can be used to pick and choose between lines and choose what in each should be saved

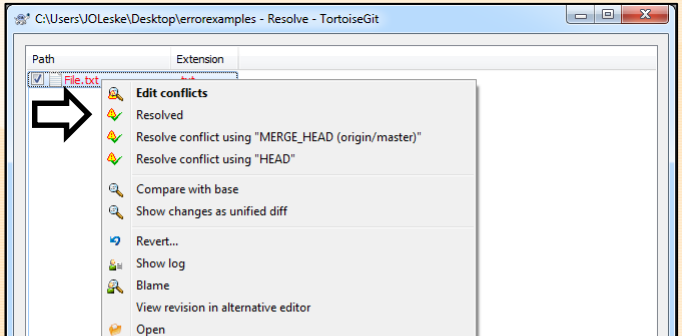
- Only works on text based files
  - Code
  - Text based assets



Conflict: Resolution

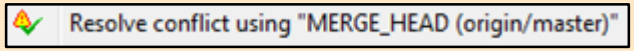
Resolved

- If the conflict is resolved manually without using the git interface they can simply be marked as resoled
- DO NOT do this unless you have actually fixed the conflict elsewhere

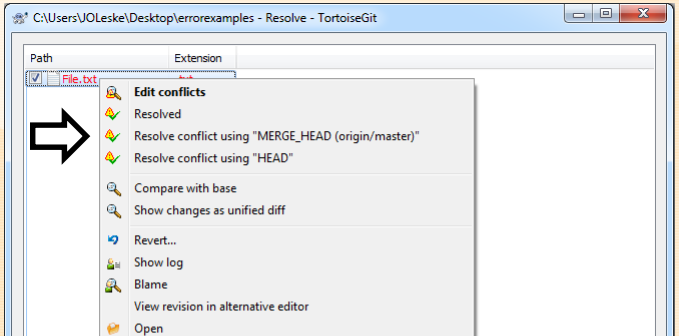


Conflict: Resolution

Resolve using “MERGE HEAD”



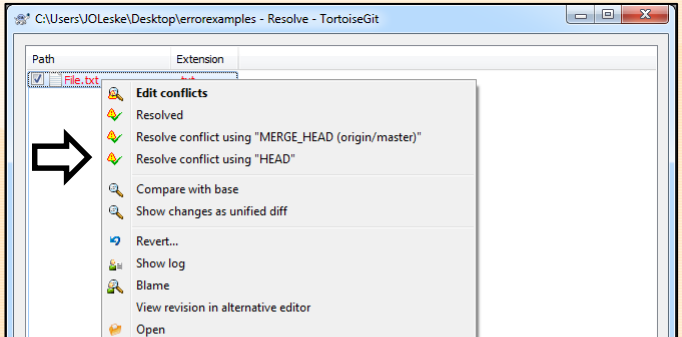
- Take all of my changes and throw them away to keep all the changes from the remote repo



Conflict: Resolution

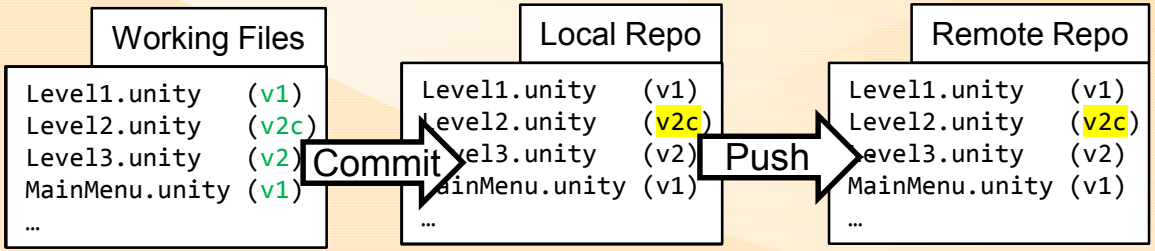
Resolve using “HEAD”

- Take all of the changes from the remote repo and throw them away to keep all of mine



Commit

After conflicts have been resolved you have to commit those changes



Git
Tips and best practices

Tips: Avoid having to merge

- Don’t work on the same files at the same time
  - Binary files (non text) cannot be merged with Git
  - Don’t work in the same scene at the same time
  - Don’t work on the same prefabs at the same time
- Communicate and check in and check out assets that everyone contributes to
  - Scene files and Prefab files being the most common sources of conflicts

Tips: Use Sandbox Scenes

- Organize the shared scenes
  - Scene for each level
- Use sandboxes
  - Each person on the team needs their own work scene.
  - Complete as much work as you can and test in the sandbox
- Integrate into shared scenes
  - Only integrate after it has been tested to work on the sandbox scenes
  - Need to be sure only one person works on a scene at a time

Tips: Integrate Often

- Integrate to the remote server each time a task is complete
- The more time between pulls the more merge problems you can encounter

Tips: Do not bloat the server space

- Time is a resource
  - Don’t push giant packages of resources if you are only using 1 thing from it
  - Huge repos take longer to push and pull
- Can cause down time when things go wrong
  - When the server is out of space no one can push or pull until the server space is freed and reset manually

Tips: Only use 1 versioning system

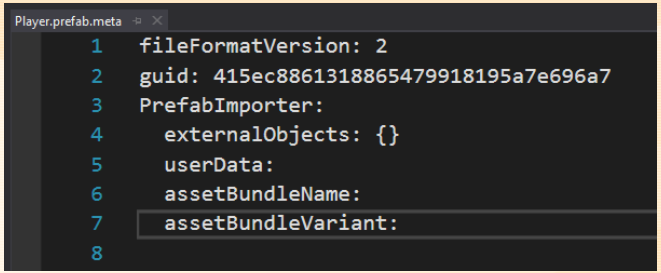
- Don’t use git in a folder that is synced with another application
  - One drive
  - Google drive
  - Dropbox
  - …
- Using 2 versioning systems at the same time can cause unexpected and unfixable issues

Tips: Learn from errors

- If things go wrong learn why and fix the problem in your process
- TortoiseGit does give useful error messages but you have to read the whole thing
  - Not just the red text
  - There is also the error help doc and contacting me on discord in case you get stuck
- Git does work
  - Most used version control system at present
  - Don’t blame the hammer when you hit your thumb

Unity: Meta files

- How they work
  - Unity generates meta files for all files in the assetsdirectory
  - Meta files contain GUIDs
  - Every reference to that asset/object in unity is done using that GUID as a reference
  - Deleting or regenerated a meta files makes all objects lose their references



- Don’t delete them
- Don’t regenerate them
- Once one is versioned keep that version

Additional help if needed

- Common Git Errors and Working with Unity and Git links under the References of the repository
- Contact Staff
  - More than happy to help you resolve a git issues
- Lot and lots of additional online tutorials for git. Most working with command line interface.

Activities

<Activity> Git crash course

Let’s use git on a team

- Create sandbox scenes in the scenes folder
  - Each team member create their own
- Coding Standards and Best Practices
  - Each team member add your name to the file
  - (text document)
- Design document
  - Each team member add your name to the file
  - (Binary file)
- Sync versions to get everyone’s changes
- You will get conflicts and errors
  - That’s the point of the activity

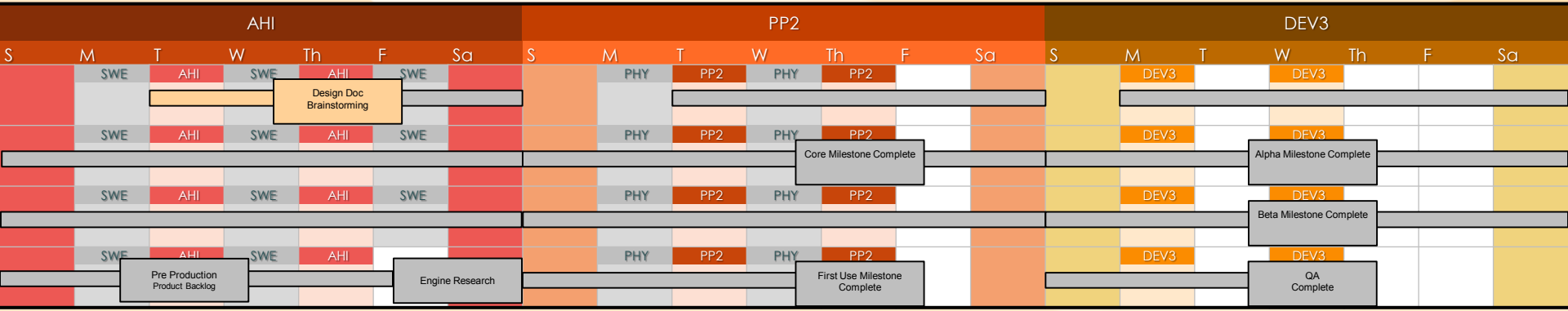
Assignmentt

Assignment

By Lecture 2

- Pre pro
  - Trello boards filled out
    - Brainstorming features completed
  - Design Document worked on
  - Risk assessments worked on
  - Coding Standards and Best Practices agreed upon

(drafts ready for review)



Contact Info

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