Version Control Management

Akhil Karri, Lucien Lee, Conner Wiench

What is Version Control?

- The method of recording and controlling changes to software code is known as version control, often known as source control. Version control systems are software applications that assist software development teams in managing changes to source code over time.
- They are especially beneficial to development teams because they help to cut development time and boost deployment success.
- Version control software stores every change to the code in a dedicated database. Whenever an error occurs, developers may go back in time and compare prior versions of the code to assist correct the error while minimizing interruption to other team members.

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What is Version Control?

- For practically all software projects, the source code is like the royal jewels - a valuable asset that must be safeguarded. For most software teams, the source code serves as a store for the developers' invaluable expertise and understanding of the issue domain, which they have accumulated and improved through deliberate work. Version control safeguards source code against both disaster and the unforeseen repercussions of human mistake.
- Software engineers working in groups are constantly developing new code and updating current code. A project's, app's, or software component's code is often structured in a folder structure or "file tree." One developer on the team may be working on a new feature while another developer edits code to solve an unrelated problem; each developer may make changes in different regions of the file tree.

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What is Version Control?

- A good version control system enables a developer's desired workflow without mandating a single method of operation. Instead of dictating which operating system or tool chain developers must use, it should function on any platform. Instead of the tedious and clunky process of file locking - giving the green light to one developer at the price of halting the development of others - great version control systems permit a seamless and continuous flow of changes to the code.
- Without version control, software teams frequently encounter issues such as not knowing which changes have been made available to users or the development of incompatible modifications between two unconnected pieces of work that must then be carefully untangled and revised. If you're a developer who has never utilized version control, you may have added versions to your files, maybe with suffixes such as "final" or "latest," and then had to deal with a new final version later. Perhaps you've commented out code blocks to deactivate specific functionality without removing the code, afraid that it could be useful later. Version control is a solution to these issues.

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Problems without this System

- Poor version control methods can lead to system breakdowns and interrupt corporate operations. And errors have tremendous repercussions. For example, a developer may release the incorrect version into production — or, worse, into a hardware device. This might harm finances, reputations, or even lives and property.
- Can’t go to the previous version of the code
- Difficulty in Collaborating
- Risk of Data loss
- Lack of Accountability
- Difficulty in managing releases
- No Traceability
- New teams cannot understand the history of the code or software

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Use Cases

- You go looking for a project file, only to discover that you have many versions and have no idea which is the correct one.
- A team member receives reviewer input and makes modifications to a file, only to discover that they updated the incorrect version.
- When an approver signed off on a file, you discovered it was an old version. You now require them to sign off again.
- What happens if someone accidentally edits, modifies, or deletes a document? All of your team's work could be lost if you don't have version control software that can restore previous versions.

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Benefits

- Version control software is recommended for high-performing software and development teams. Version control also allows developers to work more quickly enabling software teams to maintain efficiency and agility as the team grows in size.
- Every file has a comprehensive long-term modification history. This includes every update made by various people throughout the years. File creation and deletion, as well as changes to their contents, are examples of changes.
- This history should also include the author, date, and written comments on why each modification was made. Having a comprehensive history allows you to go back to past versions to aid with root cause analysis for issues, which is critical for fixing problems in older versions of software. Almost everything may be deemed a "older version" of the program if it is actively being worked on.

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Benefits

- The process of branching and merging. Working as a team is obvious, but even individuals working alone can benefit from the capacity to work on distinct streams of improvements. Using VCS technologies to create a "branch" preserves several streams of work independent of one other while simultaneously offering the ability to merge that work back together, allowing developers to ensure that the changes on each branch do not clash. Many software development teams utilize branching for each feature, or possibly for each release, or both. When deciding how to use branching and merging features in VCS, teams can pick from a variety of processes.

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Benefits

- Traceability. Tracing each change made to the program and connecting it to project management and bug tracking tools, as well as annotating each change with a note detailing the purpose and goal of the modification, can aid not only in root cause analysis and other forensics. While reading the code and attempting to understand what it is doing and why it is created the way it is, having the annotated history of the code at your fingertips may help developers make accurate and harmonic modifications that are in accordance with the system's planned long-term design. This is especially significant when working with historical code and is critical in allowing engineers to accurately anticipate future work.

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Benefits

- Management Overview. Version control provides management with a thorough view of the project's progress.They are aware of the author, the aim of the changes, the progress timetable, and the influence that the changes will have on the document's long-term goal.It assists management in identifying re-occurring difficulties that may be caused by individual team members.
- Compliance Adherence. Version control's precise recording of changes is an excellent technique to prepare your records, files, datasets, and/or documents for compliance. It is vital to maintain a thorough audit trail in order to control risk. Regulatory compliance must permeate all aspects of an organization. It entails taking responsibility for any modifications made to a database and identifying team members who had access to it.

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Benefits

- Opens Channels for Communication. Version control facilitates free communication between coworkers and teams. It is due to the ability to exchange code and track prior work that transparency and consistency are created.It allows for a more simplified approach to workflow collaboration among team members.This better communication has repercussions. It results in more efficient workflow coordination and allows team members to work more productively. They can work more in sync and harmoniously with one another while dealing with changes more easily. This frames the team's individual members as a single unit working toward a common goal.

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Types of Systems

- Distributed:
  - A distributed version control system (DVCS) allows users to access a repository from many locations. DVCSs are frequently used by developers that need to work on projects from different machines or cooperate with other developers remotely.
- Centralized
  - A centralized version control system (CVCS) is a VCS in which all users share the same central repository. This central repository might be on a server or on the local workstation of the developer. In software development projects where a team of engineers has to exchange code and monitor changes, centralized version control systems are commonly employed.

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Types of Systems

- Lock-based
  - To manage concurrent access to files and resources, a lock-based version control system employs file locking. File locking prohibits two or more users from changing the same file or resource at the same time.
- Optimistic
  - In a system with optimistic version control, each user has access to a personal workspace. They send a request to the server when they wish to share their modifications with the rest of the team. After reviewing every update, the server decides which ones may be securely merged together.

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Popular Systems

- GIT
- Perforce
- Bean Stalk
- AWS Code Summit
- Apache Sub Version
- Mercurial

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Powered By Unity

Pokemon GO - iOS, Android

Among Us - Android, iOS, PC, PlayStation, Xbox, and Nintendo Switch

Beat Saber - PC, PlayStation

My Friend Pedro - PlayStation, Android, Nintendo Switch, Xbox, PC

HearthStone - PC, Android, iOS

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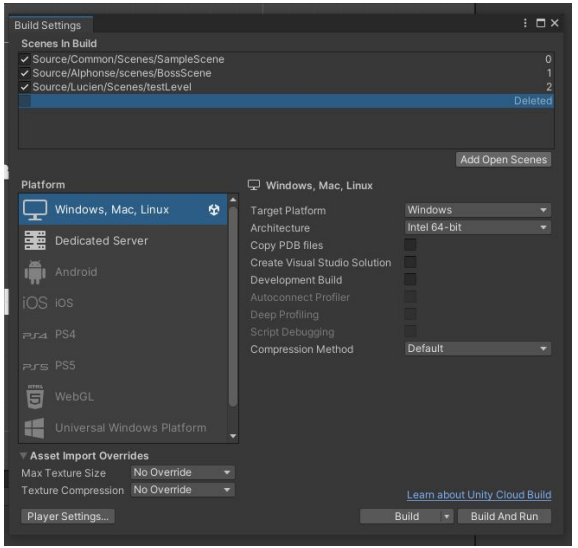
Unity Platform Options

- Unity has many different platforms to release software developments to:
  - WebGL
  - PlayStation (PS4, PS5)
  - Xbox (Xbox One, Xbox Series X/S)
  - Nintendo Switch
  - Stadia
  - Android/iOS and much more...
- As well as a plethora of VR platforms:
  - Oculus, PlayStation VR, Google's ARCore, Apple's ARKit
  - Windows Mixed Reality (HoloLens), Magic Leap
  - Unity XR SDK Steam VR, Google Cardboard

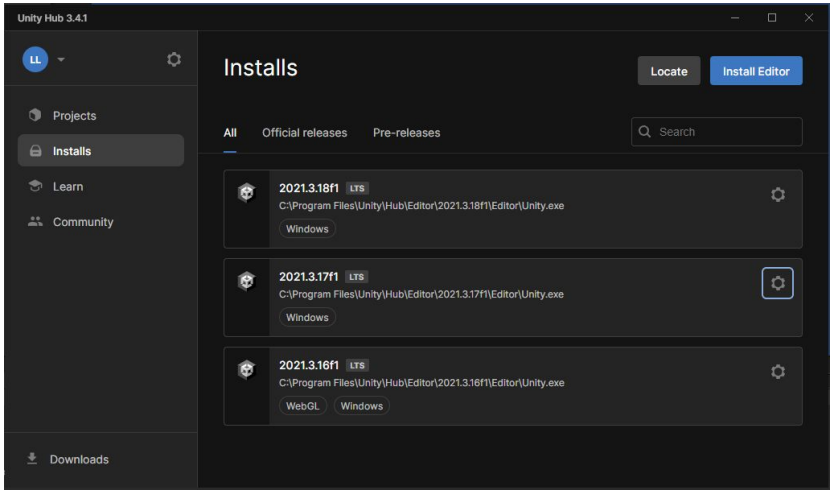
Altering Build Settings

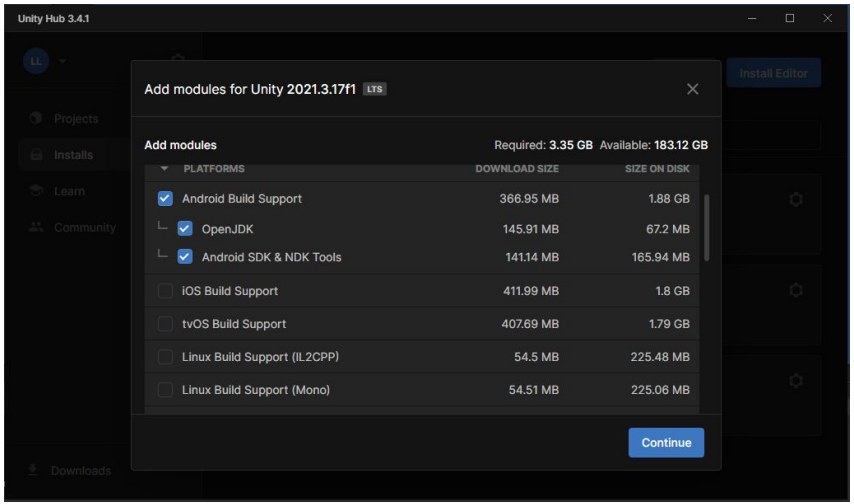
- In order to publish a different build for a different platform:
  - Place Scenes:
    - Put all the different scenes that you need for the build into the build settings
  - Platform:
    - Select the platform that you would like to make a build for
      - If the proper components are not installed then download that platform module
    - Switch to that platform to build for the selected platform
  - Build:
    - Click build to build the game
    - Alternatively click build and run to build the game, and then run it upon completion



Build To Phone

- Begin by installing the proper modules for the install.
  - For the purpose of this demo, we will be installing a game to android





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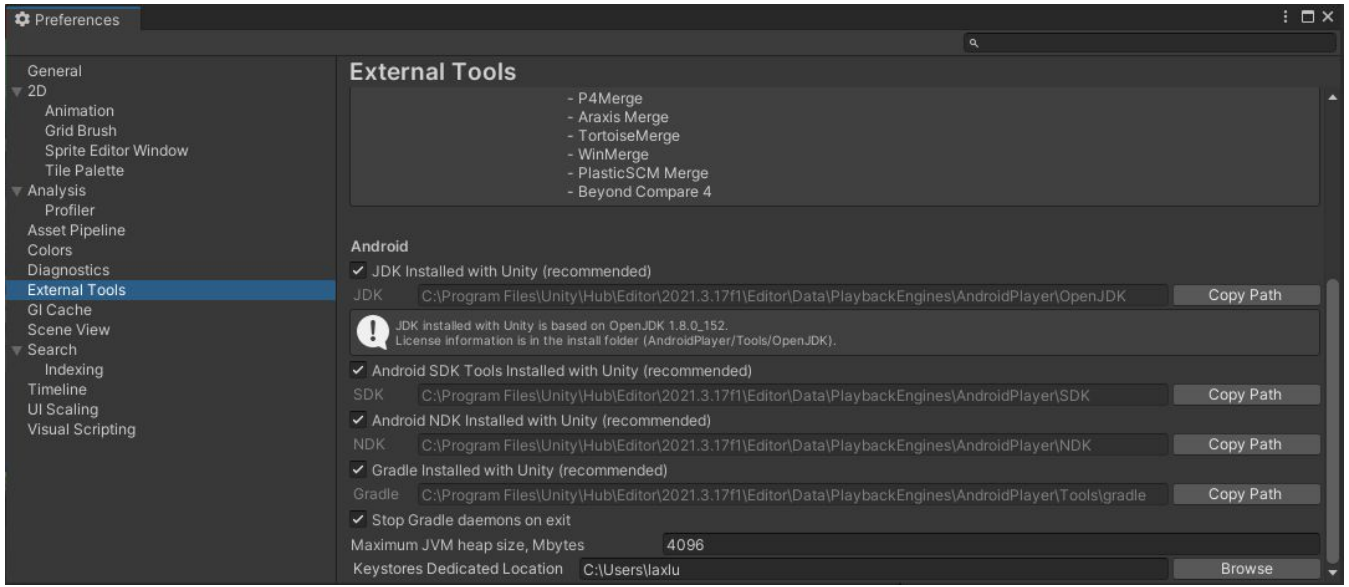
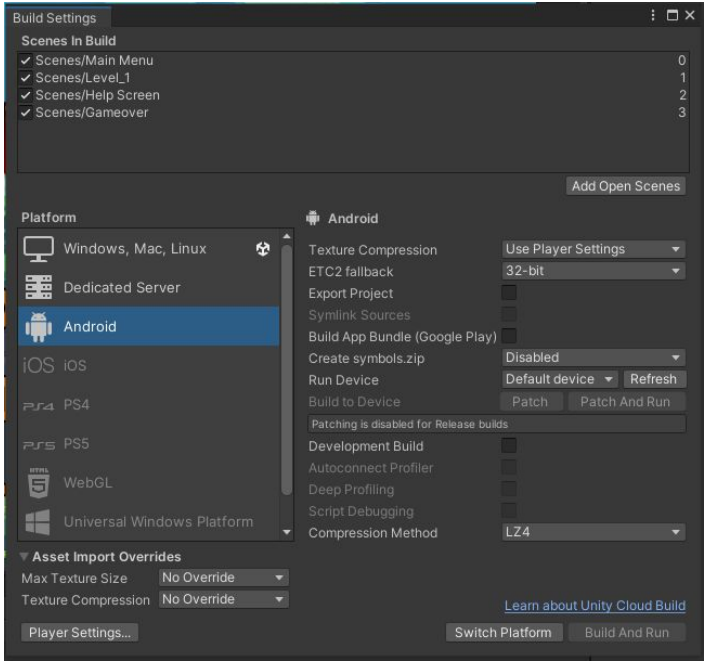
Build To Phone

- Check External tools to make sure that the paths have updated



Build To Phone

- Now switch the platform to the correct one that you would like to work on

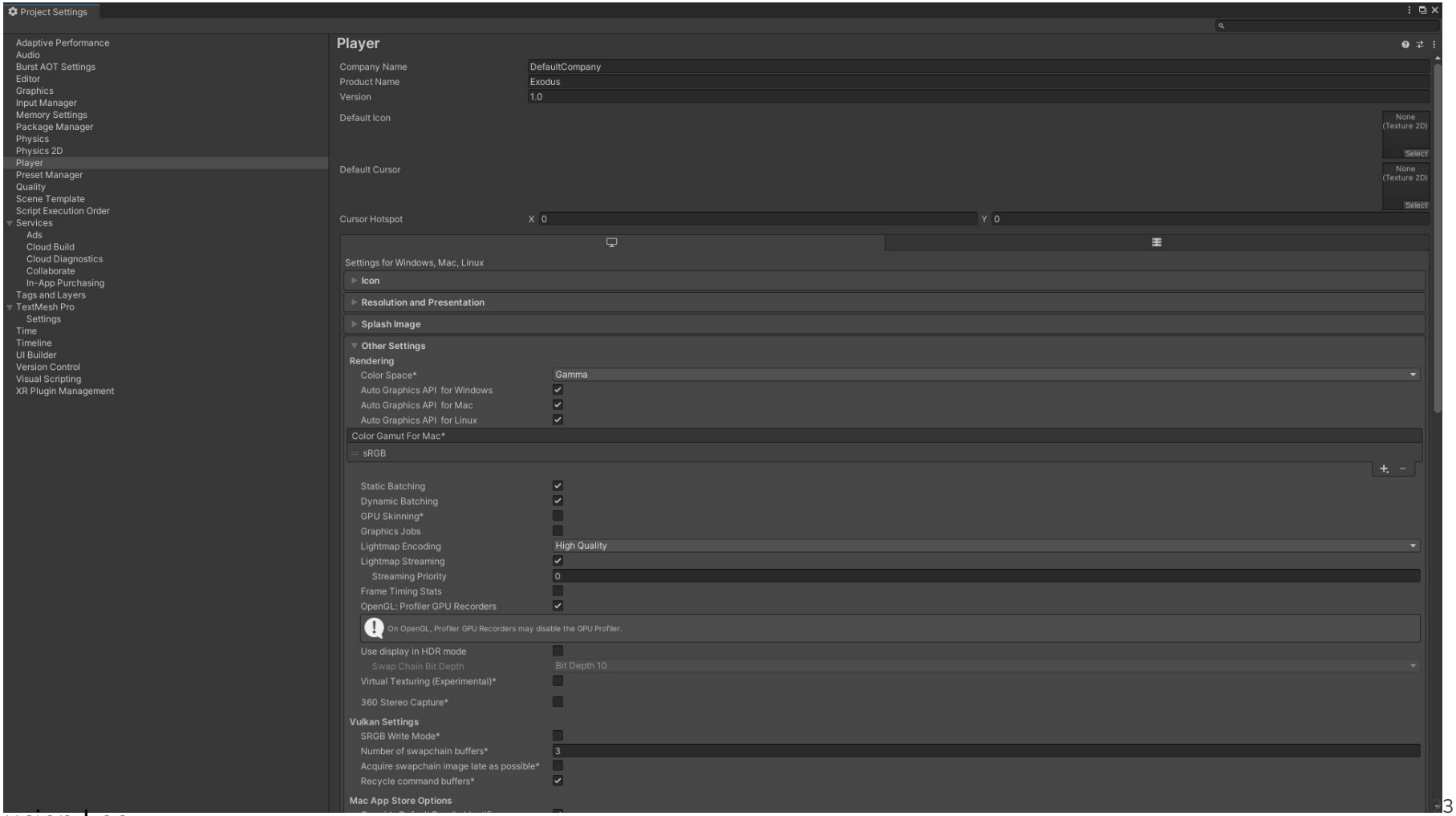


Build To Phone

- Enable Developer mode
  - On your phone, go to Settings -> General
    - Or look for About Phone
  - Navigate to Software information
    - Then find Build Number and tap it 7 times
  - This will enable developer mode

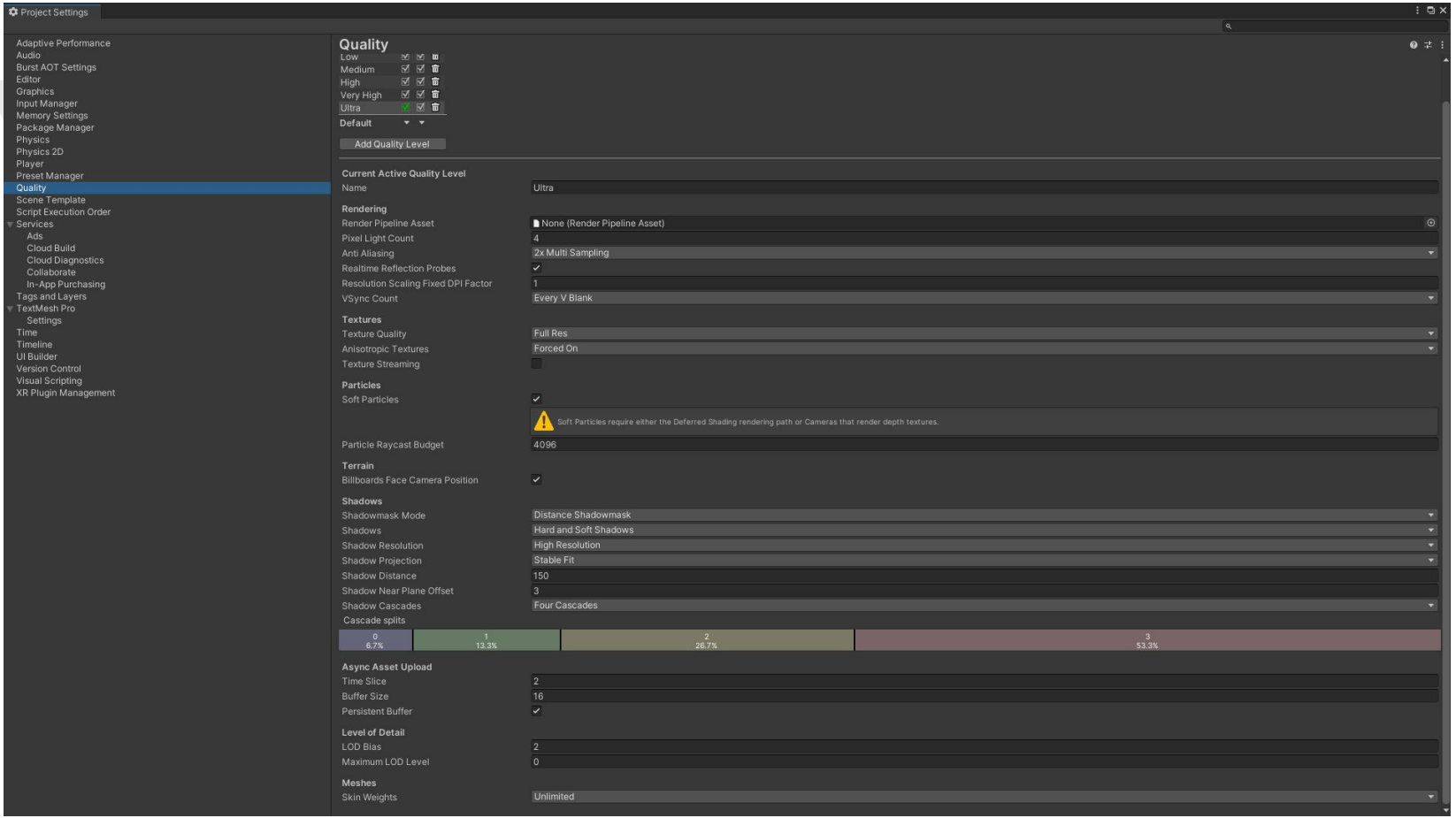
Alter Additional Information (Project Settings)

- In Project settings -> Player additional information can be changed to educate more about the build:
  - Company Name
  - Product Name
  - Version Number
  - Game Icon (This is a 2D image)
  - Resolution (This is default if option to change it isn't added in)
  - Splash Image (This is what gets displayed while the game is launching)
  - Additional settings-
    - Much of these are for VR and AR builds


Project Settings
Adaptive Performance
Audio
Burst AOT Settings
Editor
Graphics
Input Manager
Memory Settings
Package Manager
Physics
Physics 2D
Player
Preset Manager
Quality
Scene Template
Script Execution Order
Services
Ads
Cloud Build
Cloud Diagnostics
Collaborate
In-App Purchasing
Tags and Layers
TextMesh Pro
Settings
Time
Timeline
UI Builder
Version Control
Visual Scripting
XR Plugin Management
Player
Company Name
DefaultCompany
Product Name
Exodus
Version
1.0
Default Icon
None (Texture 2D)
Select
Default Cursor
None (Texture 2D)
Select
Cursor Hotspot
X 0
Y 0
Settings for Windows, Mac, Linux
Icon
Resolution and Presentation
Splash Image
Other Settings
Rendering
Color Space*
Gamma
Auto Graphics API for Windows
Auto Graphics API for Mac
Auto Graphics API for Linux
Color Gamut For Mac*
sRGB
Static Batching
Dynamic Batching
GPU Skinning*
Graphics Jobs
Lightmap Encoding
High Quality
Lightmap Streaming
Streaming Priority
0
Frame Timing Stats
OpenGL: Profiler GPU Recorders
On OpenGL, Profiler GPU Recorders may disable the GPU Profiler.
Use display in HDR mode
Swap Chain Bit Depth
Bit Depth 10
Virtual Texturing (Experimental)*
360 Stereo Capture*
Vulkan Settings
SRGB Write Mode*
Number of swapchain buffers*
3
Acquire swapchain image late as possible*
Recycle command buffers*
Mac App Store Options

Alter Additional Information (Project Settings)

- The quality of the graphics can be altered in Project Settings -> Quality:
  - Here the Developer can adjust:
    - Graphical presets
    - Set graphical defaults for the program
    - Change overall graphics settings for the program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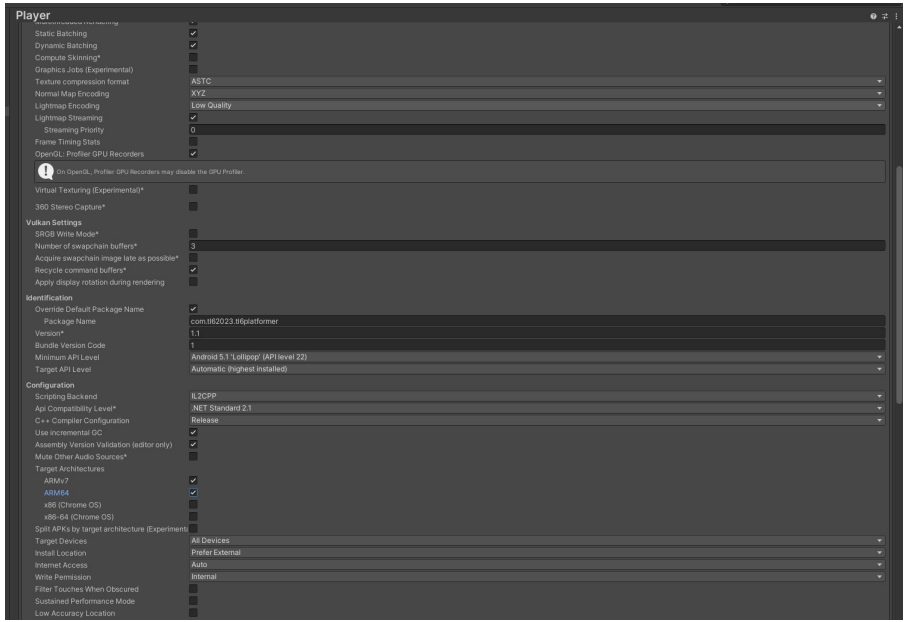
UI Builder
Version Control
Visual Scripting
XR Plugin Management
Quality
Low
Medium
High
Very High
Ultra
Default
Add Quality Level
Current Active Quality Level
Name
Ultra
Rendering
Render Pipeline Asset
None (Render Pipeline Asset)
Pixel Light Count
4
Anti Aliasing
2x Multi Sampling
Realtime Reflection Probes
Resolution Scaling Fixed DPI Factor
1
VSync Count
Every V Blank
Textures
Texture Quality
Full Res
Anisotropic Textures
Forced On
Texture Streaming
Particles
Soft Particles
Soft Particles require either the Deferred Shading rendering path or Cameras that render depth textures.
Particle Raycast Budget
4096
Terrain
Billboards Face Camera Position
Shadows
Shadowmask Mode
Distance Shadowmask
Shadows
Hard and Soft Shadows
Shadow Resolution
High Resolution
Shadow Projection
Stable Fit
Shadow Distance
150
Shadow Near Plane Offset
3
Shadow Cascades
Four Cascades
Cascade splits
0
6.7%
1
13.3%
2
26.7%
3
53.3%
Async Asset Upload
Time Slice
2
Buffer Size
16
Persistent Buffer
Level of Detail
LOD Bias
2
Maximum LOD Level
0
Meshes
Skin Weights
Unlimited

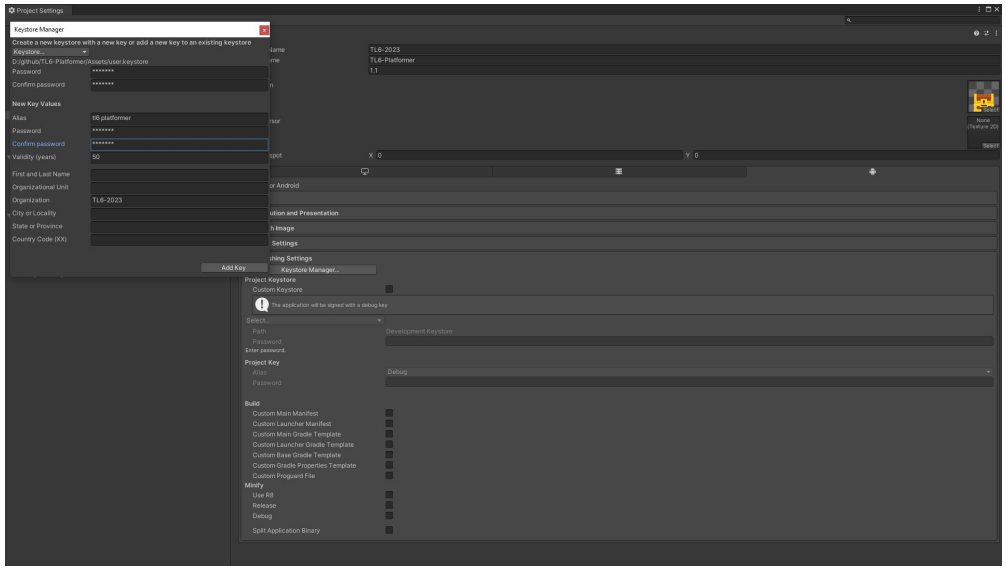
Build to Phone

- Make sure you update the Player settings for your game



Build to Phone

- Make a Keystore before you publish your app to the play store



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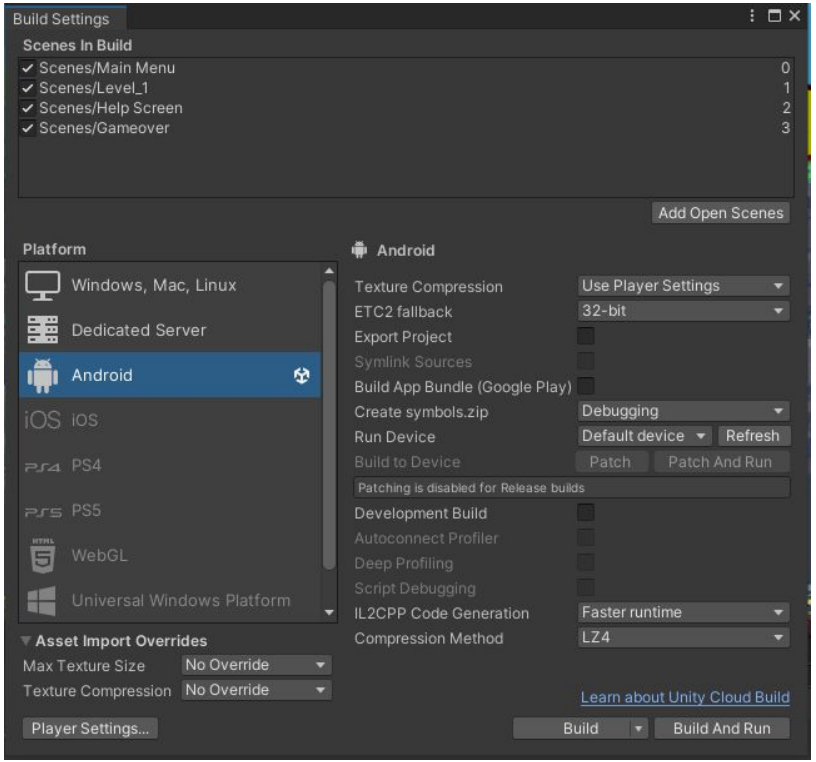
Build to phone

- Build to an apk



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Build to Phone

- Download the .apk file extension
- Make sure that your web browser enables you to download third party apps
- Once downloaded tap the app file
  - Upon install the game should be ready to play once phone settings have been altered.

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Unity Licensing

- Unity :
  - Unity has 5 different Plans: Student, Personal, Plus, Pro, Enterprise.
  - Personal and Student is free, but they are for individuals and small organizations with less than $100k of revenue per year.
  - Unity Plus is for organizations with revenue or funding not more than $200k per year (or $40/month).
  - Unity Pro is for organizations with revenue greater than $200k (or $150/month) and less than $1M. And it can also be used to publish deploy games onto Consoles.
  - If your financial threshold is exceeds $1M then you need to use the unity Industry Version.

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Unity Licensing

- For different development platforms:
  - Nintendo Switch -
    - Developing on the Nintendo Switch is completely free, and only requires the creation of an account for development. However, the purchase of the Nintendo DEV kit may be required which comes at a cost of $450.
  - PlayStation -
    - PlayStation Developers kits can be gotten through registering for the PlayStation SDK through the link: https://partners.playstation.net/. The PlayStation DEV kit costs around $2500.
    - PlayStation also offers a special student SDK for students that have a University account. The price of attaining an student PlayStation SDK is completely free while you are at the University.
  - Xbox -
    - Sign up for the ID@Xbox Program. This will enable developer publishing on Xbox so you can publish and run your program. This program costs $19.
    - Xbox Requires the purchase of a Unity Pro License in order to publish games to their platform.

Unity Licensing

- iOS -
  - In order to publish an iOS app to the App Store the developer is required to register as an Apple Developer. This account is $99 and will need to be renewed yearly.
- Android -
  - To test apps on Android, it is free for developers. This means you can upload a developer version of your game to the Google Play Store for no cost.
  - If you would like to release an app to the full Google Play Store, then your company must pay a one time fee of $25, and then you may publish as many apps as you would like.
- VR/AR
  - Developer mode must be enabled for the VR headset.
  - Once this is enabled you can upload the game to the designated platform if you followed the other required steps for that platform.

Distribution

- Self-hosting
  - Your own website
  - No Cut or Shares unless if you want to monetize by having ads in your game or in-app purchases.
  - Marketing can be a problem
- Publishers and Portals
  - Free Marketing
  - Some Percent of revenue goes to them
  - Some people want to have all their games at same place
- Websites and Native Stores
  - Free Marketing
  - Physical Copies
  - Store owners or the sellers take some cut

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README.md

Contains info about how to download, build and run the code

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README.md

TL6-Platformer

Quick Launch

- Double click the TL6-Platformer.exe file and it will run.
- Click on the play button to play the game, or the quit botton to close the game.
- Use the 'w' and 's' keys to move the character and press 'spacebar' to jump in the game.
- After the player reaches the end goal, or the player runs out of health, the game will end.

Compiling the code

Updating the code will require a new build. If you do not already have unity installed see the instructions below.

1. Clone the url to the gitHub repository - "https://github.com/ConnerWiench/TL6-Platformer"
2. Open the file location that you saved the .zip to.
3. Open Unity or download it at "https://unity.com/download"

- Be sure to get Unity version 2021.3.17f1 as this is the version of unity that this game was made with.
- Follow the Unity instalation guide through the duration of the download.
- Continue with these steps once Unity instalation is complete

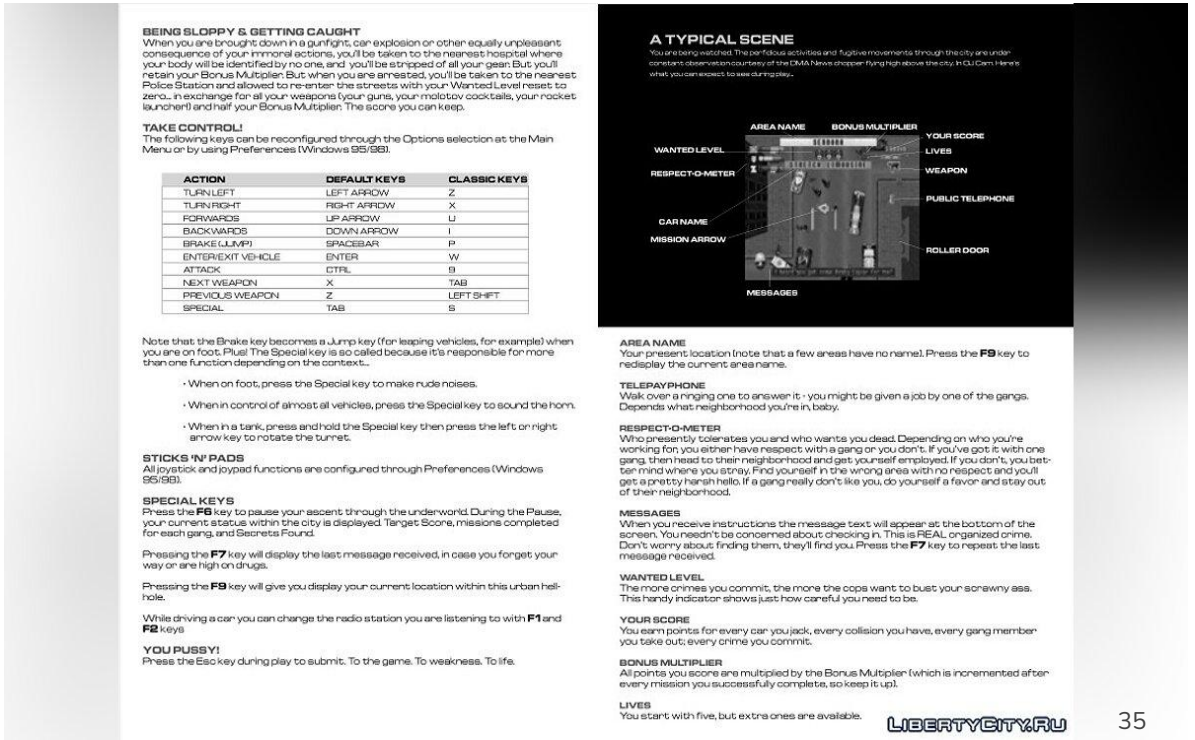
4. Select the open button in the top right corner.
5. Navigate to where the .zip is downloaded and select the folder.
6. This should open the Unity editor for the platformer game.
7. In the top left corner of the Unity editor select file -> Build & Run.
8. Unity will then compile all of the various files and create a platformer game application that you can click on to play (TL6-Platformer). Note that unity will create several other files under the same folder in order for it to run correctly. These additional files must be in the same directory of the platformer game application in order to run.

Installing Unity

1. Go the the Unity download page "https://unity.com/download" and click "download" under the version of your operating system.

User Manual

Description about the game and basic controls to play it



BEING SLOPPY & GETTING CAUGHT
When you are brought down in a gunfight, car explosion or other equally unpleasant consequence of your immoral actions, you'll be taken to the nearest hospital where your body will be identified by no one, and you'll be stripped of all your gear. But you'll retain your Bonus Multiplier. But when you are arrested, you'll be taken to the nearest Police Station and allowed to re-enter the streets with your WantedLevel reset to zero... in exchange for all your weapons (your guns, your molotov cocktails, your rocket launcher) and half your Bonus Multiplier. The score you can keep.

TAKE CONTROL!
The following keys can be reconfigured through the Options selection at the Main Menu or by using Preferences (Windows 95/98).

ACTION	DEFAULT KEYS	CLASSIC KEYS
TURN LEFT	LEFT ARROW	Z
TURN RIGHT	RIGHT ARROW	X
FORWARDS	UP ARROW	U
BACKWARDS	DOWN ARROW	I
BRAKE (JUMP)	SPACEBAR	P
ENTER/EXIT VEHICLE	ENTER	W
ATTACK	CTRL	9
NEXT WEAPON	X	TAB
PREVIOUS WEAPON	Z	LEFT SHIFT
SPECIAL	TAB	S

Note that the Brake key becomes a Jump key (for leaping vehicles, for example) when you are on foot. Plus! The Special key is so called because it's responsible for more than one function depending on the context...

- When on foot, press the Special key to make rude noises.
- When in control of almost all vehicles, press the Special key to sound the horn.
- When in a tank, press and hold the Special key then press the left or right arrow key to rotate the turret.

STICKS 'N' PADS
All joystick and joypad functions are configured through Preferences (Windows 95/98).

SPECIAL KEYS
Press the **F6** key to pause your ascent through the underworld. During the Pause, your current status within the city is displayed. Target Score, missions completed for each gang, and Secrets Found.

Pressing the **F7** key will display the last message received, in case you forget your way or are high on drugs.

Pressing the **F9** key will give you display your current location within this urban hell-hole.

While driving a car you can change the radio station you are listening to with **F1** and **F2** keys

YOU PUSSY!
Press the Esc key during play to submit. To the game. To weakness. To life.

A TYPICAL SCENE
You are being watched. The perfidious activities and fugitive movements through the city are under constant observation courtesy of the DMA News chopper flying high above the city. In CJ Cam. Here's what you can expect to see during play...

AREA NAME
Your present location (note that a few areas have no name). Press the **F9** key to redisplay the current area name.

TELEPAYPHONE
Walk over a ringing one to answer it - you might be given a job by one of the gangs. Depends what neighborhood you're in, baby.

RESPECT-O-METER
Who presently tolerates you and who wants you dead. Depending on who you're working for, you either have respect with a gang or you don't. If you've got it with one gang, then head to their neighborhood and get yourself employed. If you don't, you better mind where you stray. Find yourself in the wrong area with no respect and you'll get a pretty harsh hello. If a gang really don't like you, do yourself a favor and stay out of their neighborhood.

MESSAGES
When you receive instructions the message text will appear at the bottom of the screen. You needn't be concerned about checking in. This is REAL, organized crime. Don't worry about finding them, they'll find you. Press the **F7** key to repeat the last message received.

WANTED LEVEL
The more crimes you commit, the more the cops want to bust your scrawny ass. This handy indicator shows just how careful you need to be.

YOUR SCORE
You earn points for every car you jack, every collision you have, every gang member you take out; every crime you commit.

BONUS MULTIPLIER
All points you score are multiplied by the Bonus Multiplier (which is incremented after every mission you successfully complete, so keep it up).

LIVES
You start with five, but extra ones are available.

LIBERTYCITY.RU

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Software Engineering Ethics

- Preparing for upcoming Ethics Exam
  - Worth 5% - 7% of your final grade
- Need to know:
  - 8 areas of Software Engineering Ethics
  - 4 areas of risk in a project
  - Copyright and what falls under
  - 4 areas deciding if fair use

- Study guide on Dr. BC's website

Conner

Software Ethics: Public

- Public
  - Software engineers shall act consistently with the public interest.
- In Particular
  - Accept full responsibility for their own work.
  - Moderate interests to align with public good.
  - Approve only what they know to be safe and good.
  - Disclose any potential danger to the proper authorities.
  - Cooperate with the public to address concerns.
  - Be honest in public statements.
  - Consider issues the public may suffer.
  - Be encouraged to volunteer professional skills.

Conner

Software Ethics: Client and Employer

- Client and Employer
  - Software Engineers shall act in best interest of their clients and employer, whilst remaining consistent with the public interest.
- In Particular
  - Be honest about your areas of competence and limitations.
  - Never knowingly use software that is unethically obtained.
  - Use employer and client resources only as authorized.
  - Keep confidential information private.
  - Notify if a project, for any reason, will fail by gathering evidence.
  - Promote no interest adverse to employer or client unless there is an ethical concern.

Conner

Software Ethics: Product

- Product
  - Software engineers shall ensure that their products and related modifications meet the highest professional standards possible.
- In Particular
  - Strive for high quality, efficient cost, and reasonable schedule.
  - Proper and achievable goals for any project.
  - Follow professional standards, excluding when ethics are of concern.
  - Maintain the integrity of data.
  - Treat maintenance to same as professional development.
  - Ensure adequate testing, debugging, and review of software.

Conner

Software Ethics: Judgment

- Judgement
  - Software engineers shall maintain integrity and independence in their professional judgement.
- In Particular
  - Base judgments on the need to maintain human values.
  - Only endorse documents prepared under your supervision or in an area of competence.
  - Maintain professionalism and respect when evaluation documents.
  - Don’t engage in deceptive financial practices. (Bribery, Double billing, etc)
  - Disclose to all concerned parties when a conflict cannot be avoided.
  - Do not participate in anyway with software related issues that undisclosed conflicts.

Conner

Software Ethics: Management

- Management
  - Software engineering managers and leaders shall subscribe to and promote an ethical approach to the management of software development and maintenance.
- In Particular
  - Manage with effective procedures for promotion of quality and reduction of risk.
  - Ensure software engineers are informed of the standards being held to them.
  - Assign work with idea of educational and experience and push to further those.
  - Your demands must be realistic with an assessment of uncertainty.
  - Provide due process in response to violation of employer's policy or this code.
  - Offer a fair and just remuneration.

Conner

Software Ethics: Profession

- Profession
  - Software engineers shall advance the integrity and reputation of the profession consistent with the public interest.
- In Particular
  - Help develop and organized environment.
  - Promote public knowledge of software engineering and following ethics.
  - Recognize that violations of this code are considered unprofessional.
  - Don’t promote your own interest as the expense of professionalism.
  - Take responsibility for detecting, correcting, and reporting errors in software.

Conner

Software Ethics: Colleagues

- Colleagues
  - Software Engineers shall be fair to and supportive of their colleagues.
- In Particular
  - Encourage colleagues to adhere to this code.
  - Assist each other in professional development.
  - Credit the work of others and not taking undue credit.
  - Give a fair hearing of opinions and concerns of colleagues.
  - Utilize the opinions of others when in situations outside your competence.

Conner

Software Ethics: Self

- Self
  - Software engineers shall participate in lifelong learning regarding the practice of their profession and shall promote an ethical approach to the practice of the profession.
- In Particular
  - Further their knowledge of developments on software related information.
  - Improve upon your abilities to develop and document software.
  - Not give unfair treatment to anyone because of any irrelevant prejudices.
  - Not influence others to breach this code.
  - Recognize that personal violations of this code are inconsistent with being a professional software engineer.

Conner

Areas of Risk

- Customer Mandate
  - Ensure commitment from both management and users.
- Scope and Requirements
  - Know the risk and requirements that a scope possesses.
- Execution
  - Check for proper materials and personal for execution.
- Environment
  - Acknowledge issues in the environment and how they can be avoided.

Conner

Copyright and What Falls Under

- Intellectual Property that protects original works of authorship
  - Must be in a tangible form of expression.
- Everyone is a copyright owner
  - No paperwork is required.
- What does copyright protect you from?
  - Reproduction with copies
  - Derivatives of your work
  - Redistribution or display of your work
  - Unless you give permission and subject to certain limitations
- Last 70 years after the author’s death

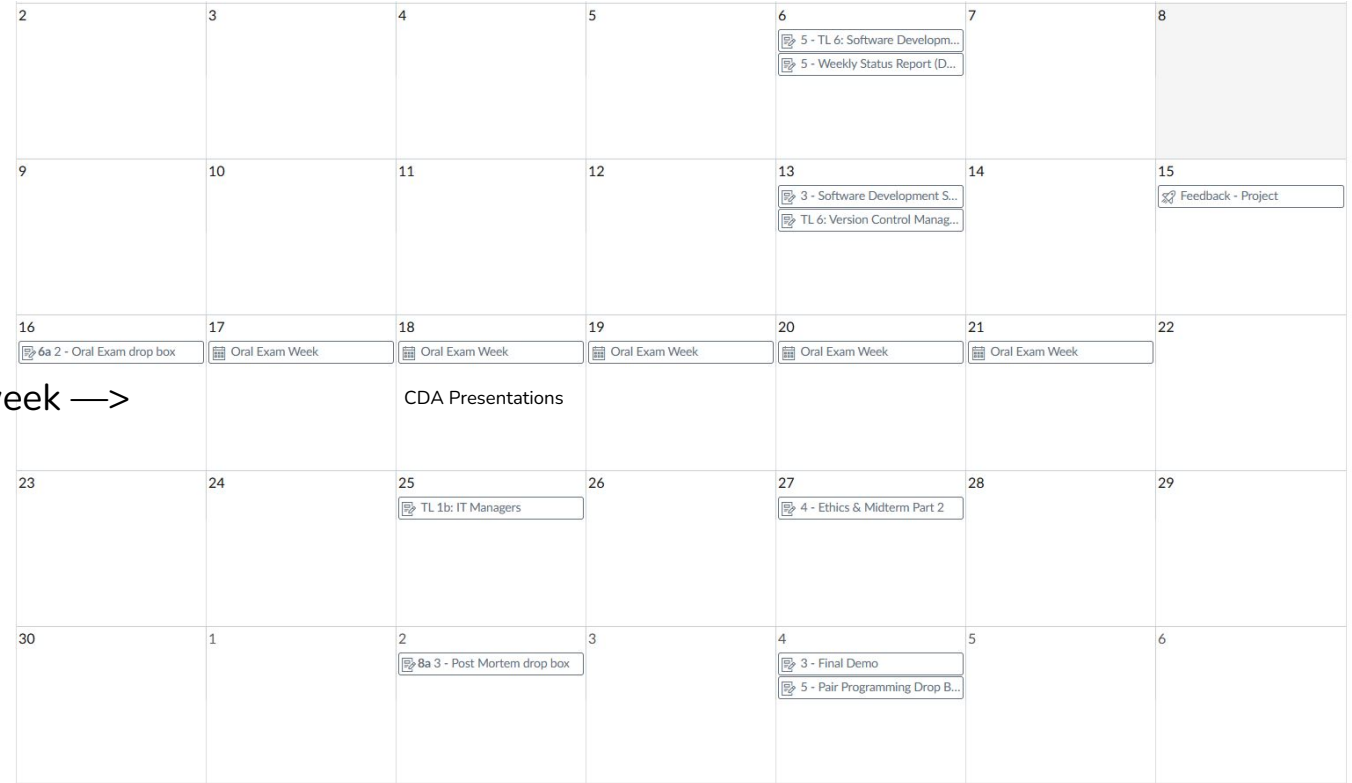
Conner

Deciding Fair Use (Four Factors)

- The purpose and character of your use
  - Why do you use the work
  - Examples: Education, Add new meaning, Parody
- The nature of the copyrighted work
  - Factual vs. Fictional creations
  - Published vs. Unpublished work
- The amount of substantiality of the portion taken
  - The amount and quality of the work taken
- The effect of the use opon the market
  - Monetary value you gained or the copyright owner lost
  - Filling the demand of the original vs. improving or changing it

Conner

Coming Up - Calendar



No lectures this week —>

CDA Presentations