

### **Question 1. Part A**

1. The system that we downloaded was Super Mario Bros Java
2. The system is designed to get Super Mario Bros. from the NES era. The system specifically takes all the code and loads it into an executable JAR file, must likely to be run on an emulator.
3. Our system has approximately 310,000 total lines of code. We calculated this by first looking at a representative class for a given section, chosen at random. For animation, for example, we looked at one class underneath that folder and counted that as the average. Not the most accurate, but rather efficient when multiple subsections are used with a given project. We continue this process for each subsection, until we have an approximate total.

### **Question 1. Part B**

1. The run through is as follows:

a.

```
DesignPatternIndex Results.txt - Notepad
File Edit Format View Help
Found 96 files that possibly contain design patterns.

C:\Users\nardi\Downloads\Mario\Mario\src\Animations\BossRollingAnim.java
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\Animations\WiggleIn.java
Possible patterns: Template

C:\Users\nardi\Downloads\Mario\Mario\src\Bricks\WoodenBridge.java
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\Collision\Player_Brick.java
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\golden\gamedev\Game.java
Possible patterns: Adapter, Composite, State

C:\Users\nardi\Downloads\Mario\Mario\src\golden\gamedev\GameEngine.java
Possible patterns: State

C:\Users\nardi\Downloads\Mario\Mario\src\golden\gamedev\GameLoader.java
Possible patterns: Strategy

C:\Users\nardi\Downloads\Mario\Mario\src\golden\gamedev\GameObject.java
Possible patterns: Composite, State

C:\Users\nardi\Downloads\Mario\Mario\src\golden\gamedev\engine\BaseAudio.java
Possible patterns: State

C:\Users\nardi\Downloads\Mario\Mario\src\golden\gamedev\engine\BaseGraphics.java
Possible patterns: Strategy

C:\Users\nardi\Downloads\Mario\Mario\src\golden\gamedev\engine\BaseIO.java
Possible patterns: State

C:\Users\nardi\Downloads\Mario\Mario\src\golden\gamedev\engine\BaseLoader.java
Possible patterns: Iterator

C:\Users\nardi\Downloads\Mario\Mario\src\golden\gamedev\engine\BaseTimer.java
Possible patterns: State

C:\Users\nardi\Downloads\Mario\Mario\src\golden\gamedev\engine\audio\JavaTempRenderer.java
```

DesignPatternsIndex.html - Notepad

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C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\engine\audio\AudioApyrtyRenderer.java  
Possible patterns: Factory

C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\engine\graphics\AppletNode.java  
Possible patterns: Strategy

C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\engine\graphics\FullScreenNode.java  
Possible patterns: Strategy

C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\engine\graphics\WindowNode.java  
Possible patterns: Strategy

C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\engine\graphics\WindowExitListener.java  
Possible patterns: Singleton

C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\funbox\errorNotificationDialog.java  
Possible patterns: Command, Factory

C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\funbox\GameSettings.java  
Possible patterns: Factory, Strategy

C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\funbox\KeyCapture.java  
Possible patterns: State

C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\object\Background.java  
Possible patterns: Singleton

C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\object\CollisionManager.java  
Possible patterns: State

C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\object\Sprite.java  
Possible patterns: State

C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\object\SpriteGroup.java  
Possible patterns: State

C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\object\Timer.java  
Possible patterns: State

C:\Users\nardi\Downloads\Mario\Mario\src\com\golden\gamedev\object\Collision\BasicCollisionGroup.java  
Possible patterns: State

b.

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Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\Equalizer.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\FramedDecoder.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\Header.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\HuffmanTab.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\InputStreamSource.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\JavaLayerError.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\JavaLayerErrors.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\JavaLayerException.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\JavaLayerHook.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\JavaLayerUtils.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\LayerIDDecoder.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\LayerIIDDecoder.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\Manager.java

c.

DesignPatternsIndex.html - Notepad

File Edit Format View Help

Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\LayerIDDecoder.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\LayerIIDDecoder.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\LayerIIDDecoder.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\Manager.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\Buffer.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\OutputChannels.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\SampleBuffer.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\Source.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\SynthesisFilter.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\player\AudioDevice.java  
Possible patterns: Bridge, State

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\player\AudioDeviceBase.java  
Possible patterns: Bridge, State, Template

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\player\AudioDeviceFactory.java  
Possible patterns: Bridge, Factory

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\player\FactoryRegistry.java  
Possible patterns: Bridge, Factory

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\player\JavazoomAudioDevice.java

d.

DesignPatternsIndex.html - Notepad

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Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\LayerIDDecoder.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\LayerIIDDecoder.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\LayerIIDDecoder.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\Manager.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\Buffer.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\OutputChannels.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\SampleBuffer.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\Source.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\decoder\SynthesisFilter.java  
Possible patterns: Bridge

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\player\AudioDevice.java  
Possible patterns: Bridge, State

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\player\AudioDeviceBase.java  
Possible patterns: Bridge, State, Template

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\player\AudioDeviceFactory.java  
Possible patterns: Bridge, Factory

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\player\FactoryRegistry.java  
Possible patterns: Bridge, Factory

C:\Users\nardi\Downloads\Mario\Mario\src\javazoom\j\player\JavazoomAudioDevice.java

```
DesignPatternFinder Results.txt
File Edit Format View Help
Possible patterns: Bridge
C:\Users\nardi\Downloads\Mario\src\Levels\Seven\Level_73.java
Possible patterns: Bridge
C:\Users\nardi\Downloads\Mario\src\Levels\Seven\Level_74.java
Possible patterns: Bridge
C:\Users\nardi\Downloads\Mario\src\Levels\Six\Level_64.java
Possible patterns: Bridge
C:\Users\nardi\Downloads\Mario\src\Levels\Three\Level_31.java
Possible patterns: Bridge
C:\Users\nardi\Downloads\Mario\src\Levels\Three\Level_34.java
Possible patterns: Bridge
C:\Users\nardi\Downloads\Mario\src\Levels\Two\Level_23.java
Possible patterns: Bridge
C:\Users\nardi\Downloads\Mario\src\Levels\Two\Level_24.java
Possible patterns: Bridge
C:\Users\nardi\Downloads\Mario\src\Levels\BalanceLift\Child.java
Possible patterns: Chain
C:\Users\nardi\Downloads\Mario\src\Levels\BalanceLift\Parent.java
Possible patterns: Chain
C:\Users\nardi\Downloads\Mario\src\Objects\Lower.java
Possible patterns: Template
C:\Users\nardi\Downloads\Mario\src\SandBox\Mario.java
Possible patterns: Bridge, Command
C:\Users\nardi\Downloads\Mario\src\SandBox\Score.java
Possible patterns: Template
C:\Users\nardi\Downloads\Mario\src\SandBox\Wholesome.java
Possible patterns: Bridge, Chain, Strategy
```

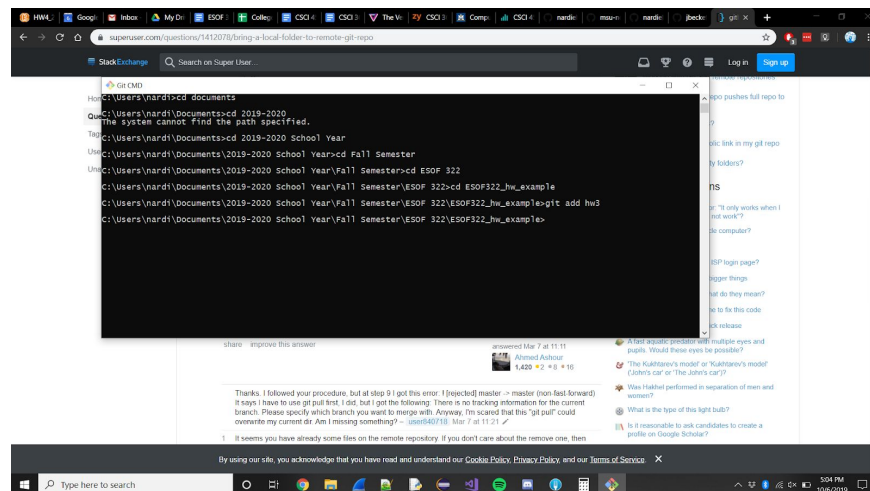
- e.
- f. The results above come from pressing the search in file content button. The following result does not come from said query.

```
Design Pattern Finder v1.0
C:\Users\nardi\Downloads\Mario\src
Found 4 files that possibly contain design patterns.
Bricks\WoodenBridge.java
Possible patterns: Bridge
Gamecom\player\AudioDeviceFactory.java
Possible patterns: Factory
Gamecom\player\FactoryRegistry.java
Possible patterns: Factory
Gamecom\player\JavaSoundAudioDeviceFactory.java
Possible patterns: Factory
```

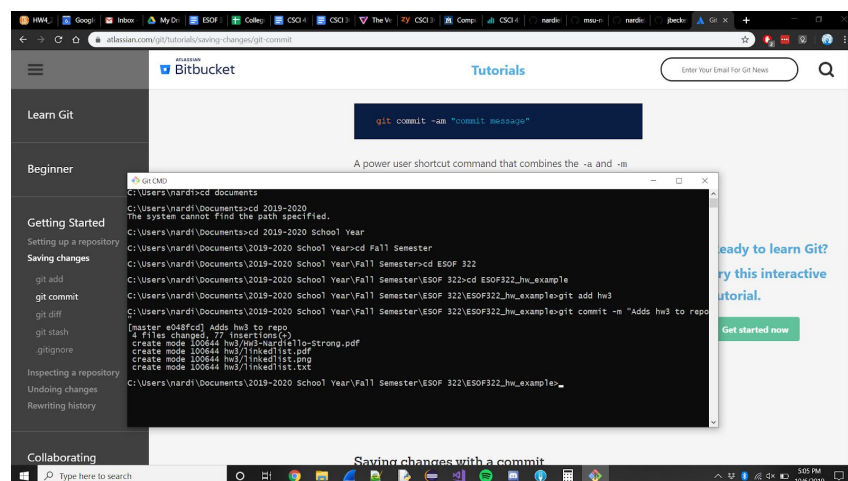
- g.
- The tool does two different searches depending on if you press the button down or not. If you tell it to look through file content, it actually dives into the code and looks for explicit examples of a pattern (interface implementations, or inheritance are good queues to look for. ) Meanwhile, if you don't press the button it simply looks for file names that may contain the info we are looking for.
  - We would do something similar to the deep dive when implementing a pattern search. We would look for instances of inheritance or interface implementation across different classes in a simple project file. Then, we will compare those results to see if any methods or files were shared between different classes. If yes, then most likely we would have a pattern. We would then classify it based upon which pattern it truly identified with. Using the more advanced method is the right call, but simply looking for names that match a pattern name simply does not work.

## Question 2

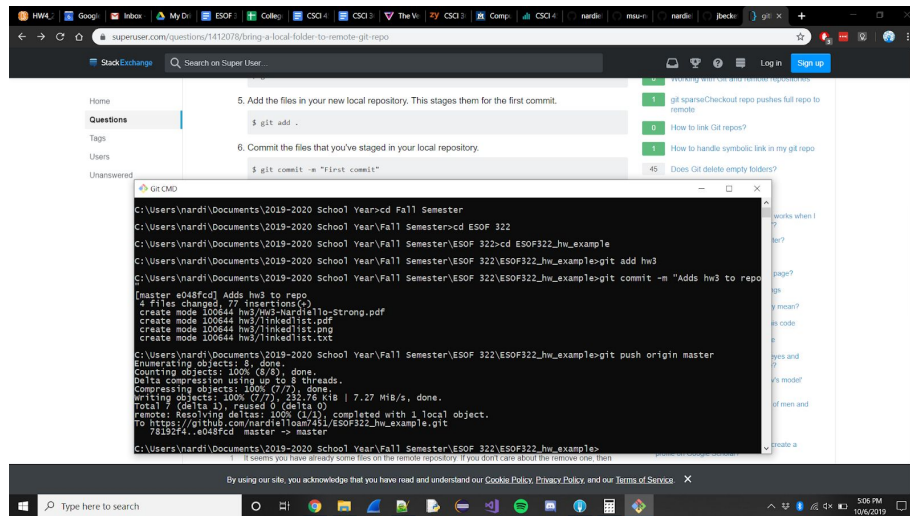
- First, you create the repo inside of Github for the ESOF 322 files, in our case it was ESOF322\_hw\_examples.
  - You then clone that repo locally onto your machine.
  - After that, you add the files into the local repo.
  - You then stage those changes you made to the files.
  - You then commit those changes to the local branch, which locks them in and makes them ready to be pushed to the Github repo.
  - You then push the changes to the GitHub repo, which if done correctly will now show all the files located in both the GitHub repo. Which it did.
- Step by step of the adding of HW3 to our repo:
  - Stages the HW3 changes to the repo
  - Commit the changes with a comment about what they are.
  - Finally, pushed the file to our main github repo. Screenshots for all steps are located down below.



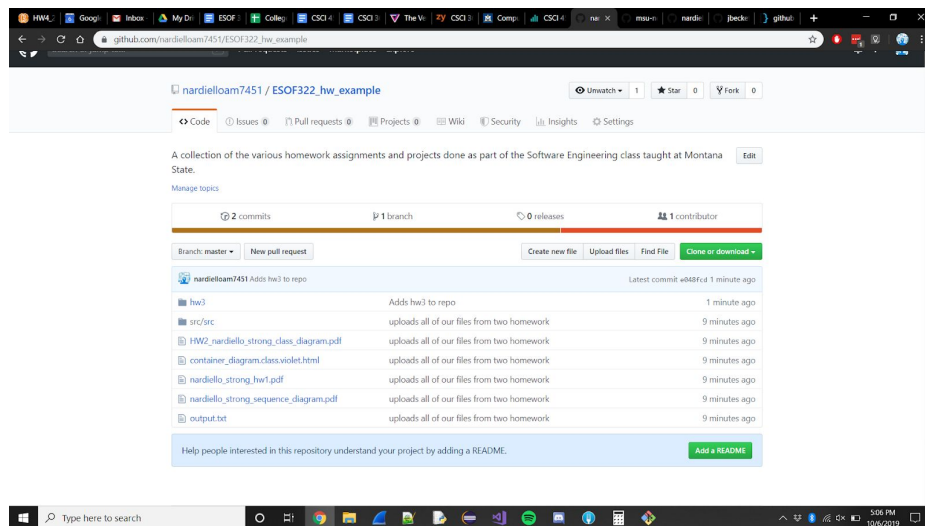
d.



e.



f.



g.