

VIRTUALIZED LEARNING



Building Unity Code Instructions

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Prerequisites

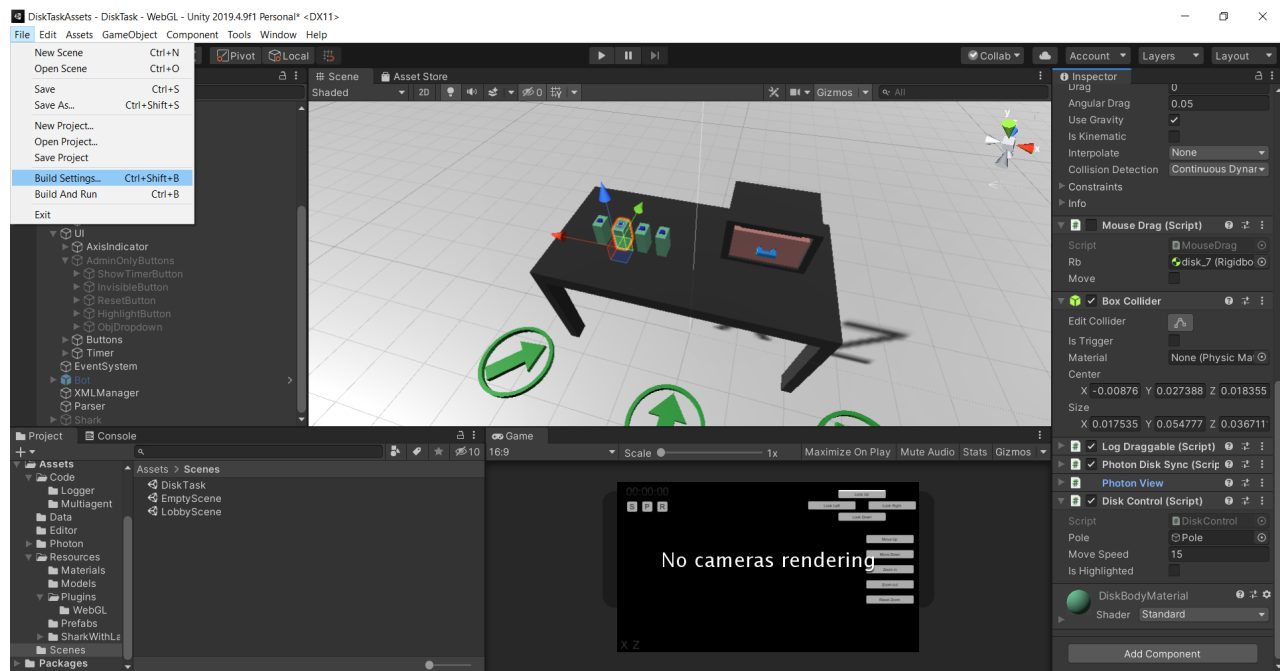
- Installation of VLEARN software on deployment server
- Unity (version Unity 2019.4.9) on local machine to build code (not required on the server)

There are two ways to build the unity into WebGL:

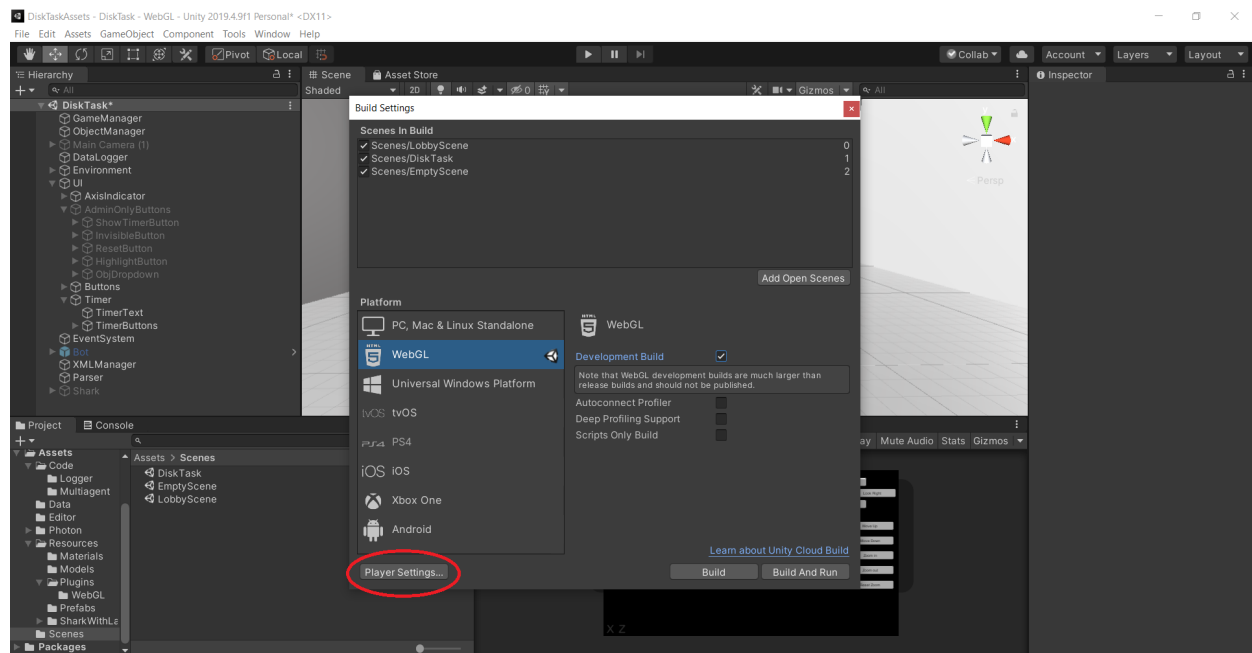
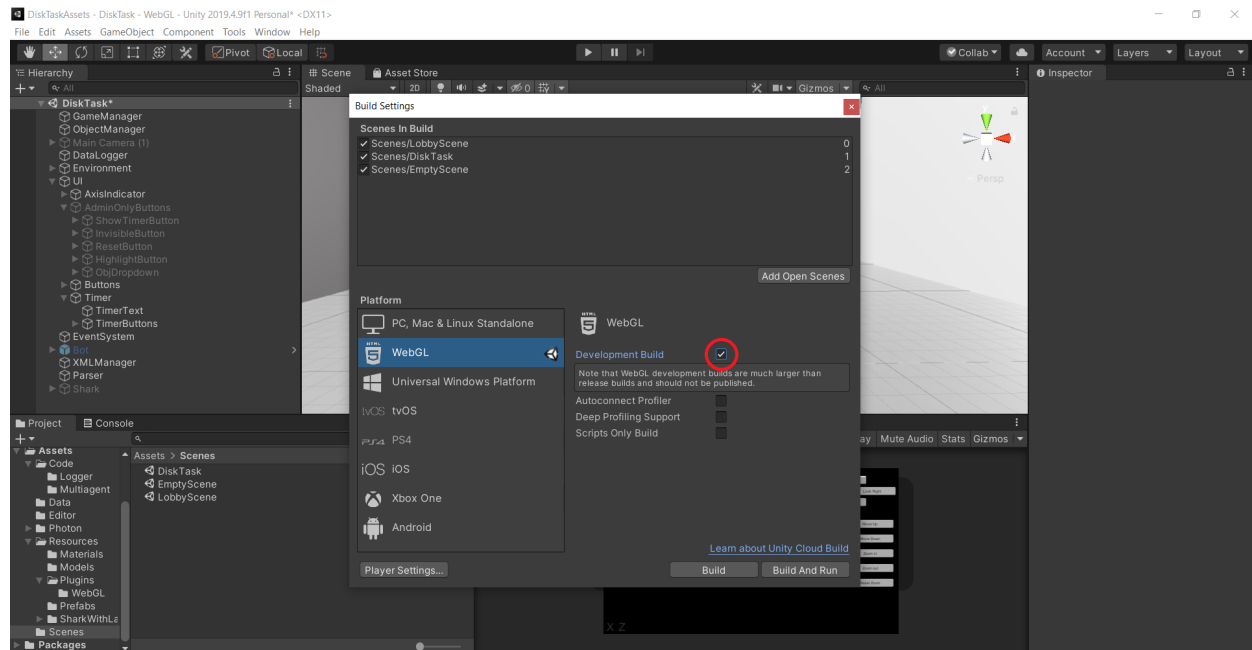
1. Build through the command line
2. Build through Unity

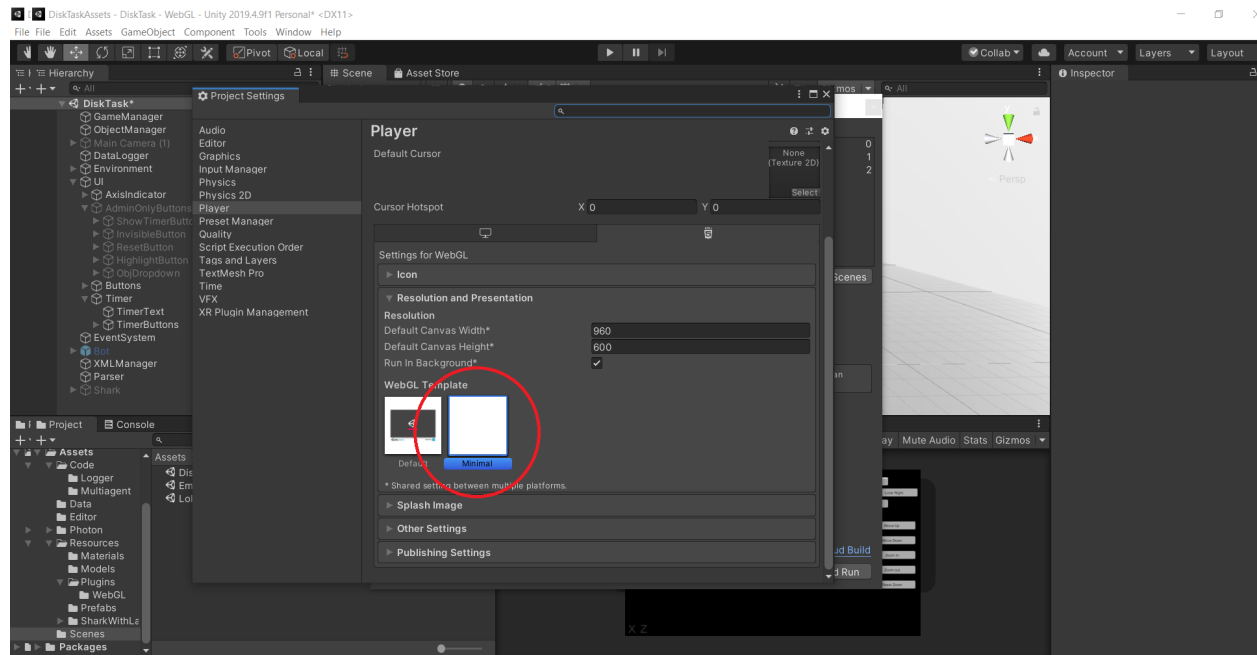
Building through Unity

1. Go to File => Build Settings to open the build window

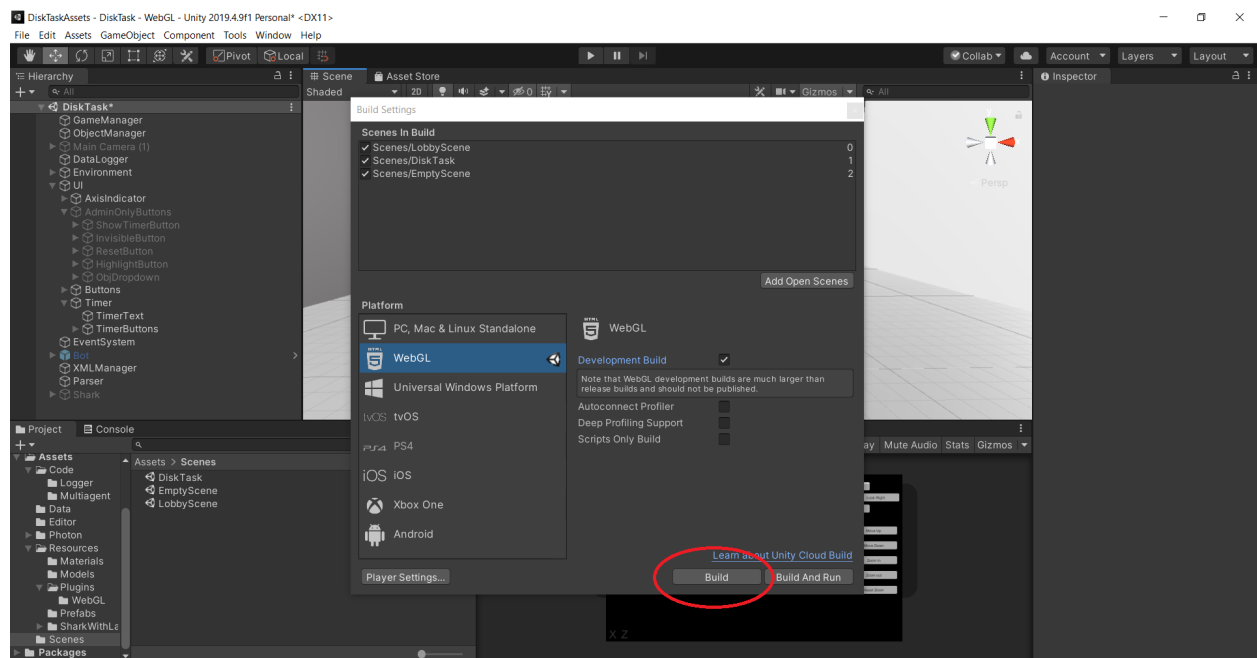


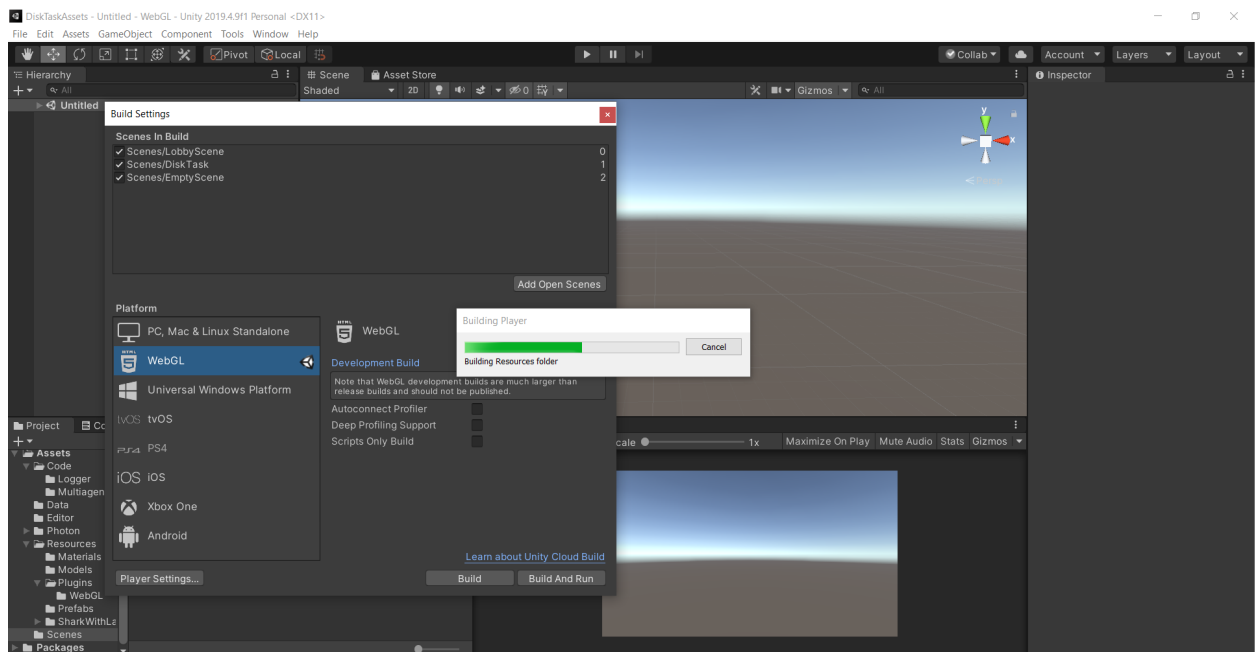
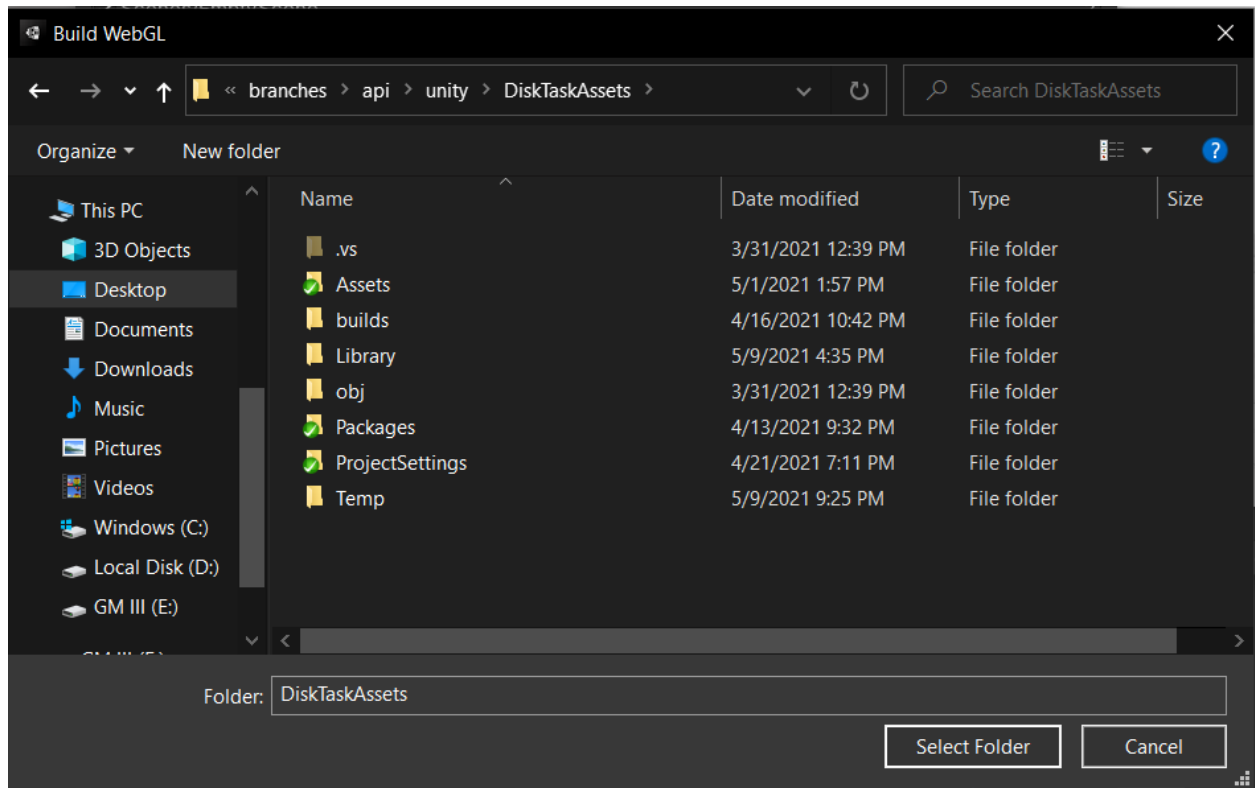
2. If you are building for development, check the development box and go to the Player Settings => Resolution and Presentation and choose the minimal WebGL template to shorten the build time





- Then after clicking the build button, a prompt asking for the build path will appear. Create a builds folder if you don't have one and click on the Select Folder to build it.





4. Wait until the build is complete. It will take some time to build.

Building through the command line

To build through the command line, you must run this command from the trunk/api/refinement directory:

```
"[UNITY INSTALL LOCATION]\2019.4.9f1\Editor\Unity.exe" -quit  
-batchmode -projectPath unity/[TASK] -executeMethod  
WebGLBuilder.build
```

For example, to build the DiskTask:

```
"C:\Program Files\Unity\Hub\Editor\2019.4.9f1\Editor\Unity.exe" -quit  
-batchmode -projectPath unity/DiskTaskAssets -executeMethod  
WebGLBuilder.build
```

For example, to build the PipeTask:

```
"C:\Program Files\Unity\Hub\Editor\2019.4.9f1\Editor\Unity.exe" -quit  
-batchmode -projectPath unity/PipeTaskAssets -executeMethod  
WebGLBuilder.build
```

For example, to build the TowerofHanoi:

```
"C:\Program Files\Unity\Hub\Editor\2019.4.9f1\Editor\Unity.exe" -quit  
-batchmode -projectPath unity/TowerOfHanoi -executeMethod  
WebGLBuilder.build
```

For example, to build the SceneCreator:

```
"C:\Program Files\Unity\Hub\Editor\2019.4.9f1\Editor\Unity.exe" -quit  
-batchmode -projectPath unity/SceneCreatorAssets -executeMethod  
WebGLBuilder.build
```

For example, to build the SceneLoader:

```
"C:\Program Files\Unity\Hub\Editor\2019.4.9f1\Editor\Unity.exe" -quit  
-batchmode -projectPath unity/SceneLoaderAssets -executeMethod  
WebGLBuilder.build
```





This command will put the build files into the specified task inside the folder:

```
[TaskAssets]/builds/[Task]/Build
```

For example, if we were building the disk task in the trunk branch, after completion of the build, we can find the build files in the folder:

```
vlearn2\Webapp\trunk\unity\DiskTaskAssets\builds\DiskTask\Build
```

Once the build is complete, four build files will be created for that specified task. These build files will look like this:

 DiskTask.data.unityweb	5/9/2021 8:18 PM	UNITYWEB File	1,643 KB
 DiskTask	5/4/2021 3:58 PM	JSON Source File	1 KB
 DiskTask.wasm.code.unityweb	5/9/2021 8:18 PM	UNITYWEB File	5,323 KB
 DiskTask.wasm.framework.unityweb	5/9/2021 8:18 PM	UNITYWEB File	89 KB

These four build files are important because these four files are what you will be putting into the webapp as explained in more detail below in the next section.

Once the build is complete, you must deploy the builds to the webapp which will be discussed in more detail below in the next section.

We have conveniently created a build script that builds all of the unity projects at once. This script can be located in any of the branches (trunk/api/refinement) of our svn repository:

<https://vis.cs.umd.edu/svn/projects/vlearn2/Webapp/>

This is what the build script looks like:

```
1 #!/bin/sh
2 set -e
3
4 SECONDS=0
5
6 # SCRIPTPATH=$( cd -- "$(dirname "$0")" >/dev/null 2>&1 ; pwd -P )
7
8 # echo $SCRIPTPATH
9
10 echo "Beginning build..."
11
12 # TODO generate build for each
13 # FIXME does that static path work on other people's machines?
14
15 # TODO Gather up all the builds/tasks/Build folders and copy their contents into vlearn_webapp/views/tasks/Build
16 # Could probably edit all of their Assets/Editor/WebGLBuilder files to output to one central Build folder then you'd only need to delete the webapps Build folder and replace it
17 # You only need 1 UnityLoader.js
18
19 echo "DiskTaskAssets"
20 "C:\Program Files\Unity\Hub\Editor\2019.4.9f1\Editor\Unity.exe" -quit -batchmode -projectPath unity/DiskTaskAssets -executeMethod WebGLBuilder.build &
21 echo "PipeTaskAssets"
22 "C:\Program Files\Unity\Hub\Editor\2019.4.9f1\Editor\Unity.exe" -quit -batchmode -projectPath unity/PipeTaskAssets -executeMethod WebGLBuilder.build &
23 echo "TowerOfHanoi"
24 "C:\Program Files\Unity\Hub\Editor\2019.4.9f1\Editor\Unity.exe" -quit -batchmode -projectPath unity/TowerOfHanoi -executeMethod WebGLBuilder.build &
25 echo "SceneCreatorAssets"
26 "C:\Program Files\Unity\Hub\Editor\2019.4.9f1\Editor\Unity.exe" -quit -batchmode -projectPath unity/SceneCreatorAssets -executeMethod WebGLBuilder.build &
27 echo "SceneLoaderAssets"
28 "C:\Program Files\Unity\Hub\Editor\2019.4.9f1\Editor\Unity.exe" -quit -batchmode -projectPath unity/SceneLoaderAssets -executeMethod WebGLBuilder.build &
29
30 wait
31
32 echo "Build Complete in $SECONDS seconds"
```

As you can see above, the build script just takes the build command and runs it 5 times for the different unity projects.

IMPORTANT NOTE: The build script must be run from root of a branch directory in order to work






To run the build script, from any branch directory, simply run the command

```
./build.sh
```






















Building all of the unity projects at once will take quite some time, so when working throughout the semester, we recommend only building the projects that you have made changes to instead of building all at once.

Deploying builds to webapp

1. After building the unity project, you would have these 5 files inside your build directory

Name	Date modified	Type	Size
 DiskTask.data.unityweb	5/4/2021 2:17 AM	UNITYWEB File	1,933 KB
 DiskTask	5/4/2021 2:17 AM	JSON File	1 KB
 DiskTask.wasm.code.unityweb	5/4/2021 2:17 AM	UNITYWEB File	5,334 KB
 DiskTask.wasm.framework.unityweb	5/4/2021 2:17 AM	UNITYWEB File	89 KB
 UnityLoader	8/17/2020 10:27 PM	JavaScript File	156 KB

2. You need to copy these files and replace the files with the same name in `..\vlearn_webapp\views\tasks\Build` directory to deploy your new build to the webapp.

Name	Date modified	Type	Size
 DiskTask.data.unityweb	5/9/2021 8:18 PM	UNITYWEB File	1,643 KB
 DiskTask	5/4/2021 3:58 PM	JSON Source File	1 KB
 DiskTask.wasm.code.unityweb	5/9/2021 8:18 PM	UNITYWEB File	5,323 KB
 DiskTask.wasm.framework.unityweb	5/9/2021 8:18 PM	UNITYWEB File	89 KB
 PipeTask.data.unityweb	5/9/2021 8:18 PM	UNITYWEB File	72,559 KB
 PipeTask	5/4/2021 3:59 PM	JSON Source File	1 KB
 PipeTask.wasm.code.unityweb	5/9/2021 8:18 PM	UNITYWEB File	5,542 KB
 PipeTask.wasm.framework.unityweb	5/9/2021 8:18 PM	UNITYWEB File	89 KB
 SceneCreator.data.unityweb	5/3/2021 10:26 PM	UNITYWEB File	2,379 KB
 SceneCreator	5/3/2021 10:26 PM	JSON Source File	1 KB
 SceneCreator.wasm.code.unityweb	5/3/2021 10:26 PM	UNITYWEB File	4,700 KB
 SceneCreator.wasm.framework.unityweb	5/3/2021 10:26 PM	UNITYWEB File	87 KB
 SceneLoader.data.unityweb	5/3/2021 10:26 PM	UNITYWEB File	2,372 KB
 SceneLoader	5/3/2021 10:26 PM	JSON Source File	1 KB
 SceneLoader.wasm.code.unityweb	5/3/2021 10:26 PM	UNITYWEB File	4,726 KB
 SceneLoader.wasm.framework.unityweb	5/3/2021 10:26 PM	UNITYWEB File	87 KB
 TowerOfHanoi.data.unityweb	5/4/2021 4:01 PM	UNITYWEB File	1,606 KB
 TowerOfHanoi	5/4/2021 4:01 PM	JSON Source File	1 KB
 TowerOfHanoi.wasm.code.unityweb	5/4/2021 4:01 PM	UNITYWEB File	5,286 KB
 TowerOfHanoi.wasm.framework.unityweb	5/4/2021 4:01 PM	UNITYWEB File	89 KB
 UnityLoader	5/3/2021 10:26 PM	JavaScript File	156 KB

3. That's it! Your new builds can now be accessed by running the webapp locally on your machine, or by creating a tag and updating the vm to the most recent tag which is explained in the SVN documentation document.