

# CS 2261 Lab 00:

# Mac Installation

## Provided Files

- Makefile
- main.c
- tasks.json
- visualboyadvance-m-Mac.zip

## Files to Edit/Add

- tasks.json

## Instructions

In this lab, you will be installing the software to write, compile, and run GBA games for this class. It is broken up into three key parts. If at any time you encounter an issue, alert a TA and fix the problem before continuing.

### Part 1: Docker Desktop

First, you'll need to download Docker Desktop. In order to do this, you'll need to sign up for Docker Hub. Sign up for Docker Hub here: <https://hub.docker.com/signup>

Once you've signed up, follow the detailed Docker Desktop download instruction here: <https://docs.docker.com/docker-for-mac/install/>

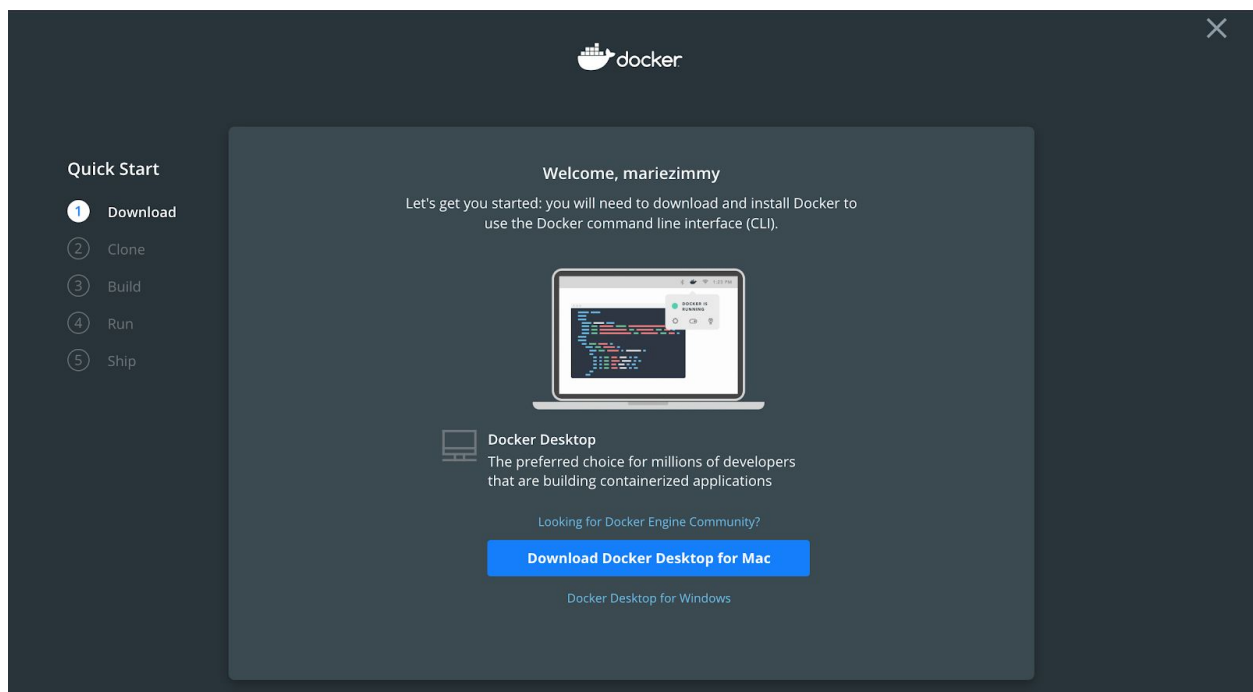
# Install Docker Desktop on Mac

*Estimated reading time: 6 minutes*

To download Docker Desktop, go to Docker Hub and sign in with your Docker ID.

[Download from Docker Hub](#)

Here, you'll click on the "Download from Docker Hub" button (as seen above) and, granted you're logged into the Docker Hub account you created, you'll be taken to a new page that looks like the following:



Press the "Download Docker Desktop for Mac" button. In your downloads, you'll see "Docker.dmg".

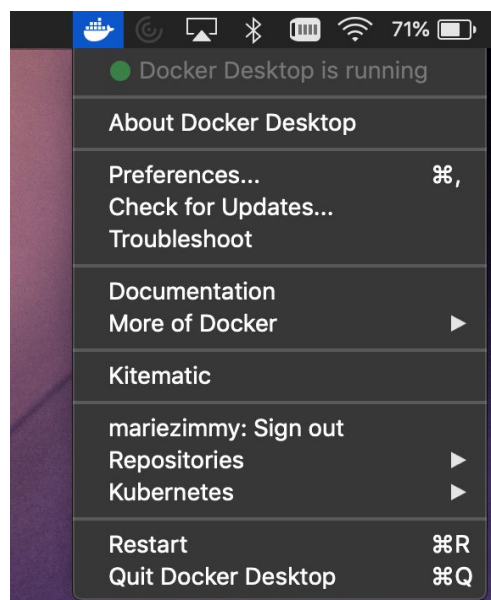
Now, follow the "Install and run Docker Desktop on Mac" instructions on the Docker Desktop download instructions page (<https://docs.docker.com/docker-for-mac/install/>).

Great, you've got Docker Desktop on your machine! :)

Go to your applications, and click Docker.app, as seen below.



You should see, in the top right of your screen, a little icon that looks like the following:



This icon indicates that Docker Desktop is running on your machine! **YOU MUST BE RUNNING DOCKER IN ORDER TO BUILD YOUR CODE.** Otherwise, when you attempt to build your code, you will see the following error:

```
Terminal will be reused by tasks, press any key to close it.

> Executing task: docker run --rm -it -v ${PWD}:/gba gba-compiler <

docker: Error response from daemon: dial unix docker.raw.sock: connect: connection refused.
See 'docker run --help'.
The terminal process terminated with exit code: 125

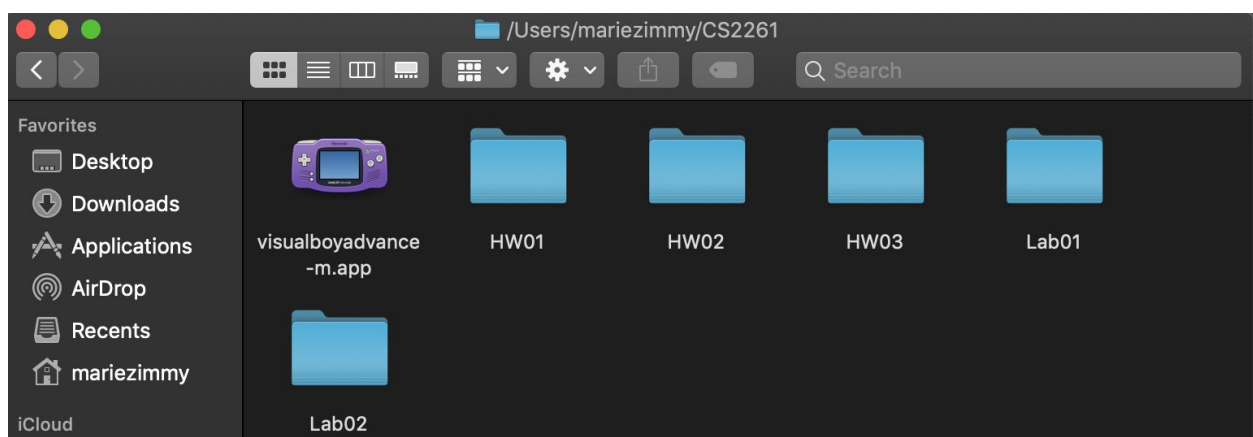
Terminal will be reused by tasks, press any key to close it.
```

If you see this, you'll know you forget to open the Docker Desktop application.

## Part 2: VisualBoyAdvance-M

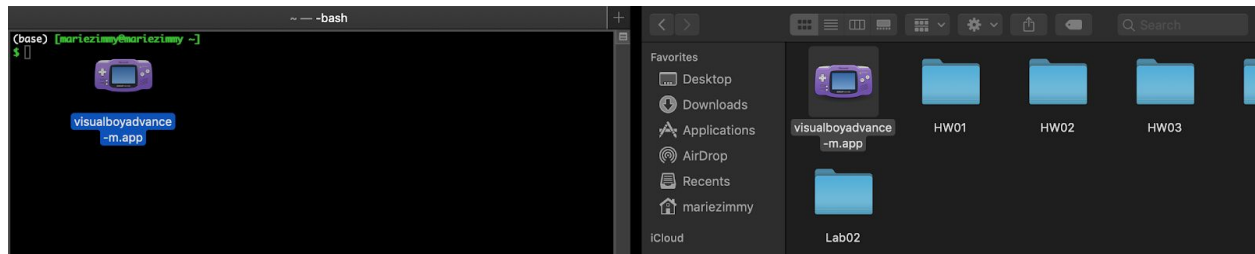
Let's get the GBA emulator setup! VisualBoyAdvance-M is the emulator for this class. If you already have a GBA emulator that you are comfortable with, I still highly recommend you use this one for this class. It has some special features that will come in handy for debugging.

Unzip the "visualboyadvance-m-Mac.zip" and put the unzipped application in a folder. I recommend creating a CS2261 folder that will contain all of your homework, labs, etc. and keeping the "visualboyadvance-m.app" in this folder. Lab00 should be in this folder, too. Keep a note of the exact path of the "visualboyadvance-m.app". In the image below, you'll see a recommended folder setup. The exact path to "visualboyadvance-m.app", in my case, is  
/Users/mariezimmy/CS2261/visualboyadvance-m.app



You can verify the directory location of the "visualboyadvance-m.app" on your machine

by simply opening Finder, opening the CS2261 folder where you placed the "visualboyadvance-m.app", and dragging the "visualboyadvance-m.app" icon into the terminal. The output in the terminal is the exact path to the "visualboyadvance-m.app". The sequence of images below shows this process.



In my case, as stated before, the exact path is `/Users/mariezimmy/CS2261/visualboyadvance-m.app`. Copy this exact path and paste it into your `task.json`, on line 9 in between "open" and `./Project.gba`. Make sure there is a space after "open" and before `./Project.gba`

The image below outlines what my `task.json` looks like. Your exact path on line 9 will be different!

```
1 {
2   // See https://go.microsoft.com/fwlink/?LinkId=733558
3   // for the documentation about the tasks.json format
4   "version": "2.0.0",
5   "tasks": [
6     {
7       "label": "build run",
8       "type": "shell",
9       "command": "open /Users/mariezimmy/CS2261/visualboyadvance-m.app ./Project.gba",
10      // add the visualboyadvance-m.app exact path to the above line,
11      // in between "open" and "./Project.gba"!
12      "problemMatcher": [],
13      "dependsOn": ["build"],
14      "group": {
15        "kind": "build",
16        "isDefault": true
17      }
18    },
19    {
20      "label": "build",
21      "type": "shell",
22      "command": "docker run --rm -it -v ${PWD}:/gba aaaronic/gba-compiler:1.0",
23      "problemMatcher": []
24    },
25    {
26      "label": "clean",
27      "type": "shell",
28      "command": "docker run --rm -it -v ${PWD}:/gba aaaronic/gba-compiler:1.0 bash -c 'cd /gba && make clean'",
29      "problemMatcher": []
30    }
31  ]
32 }
```

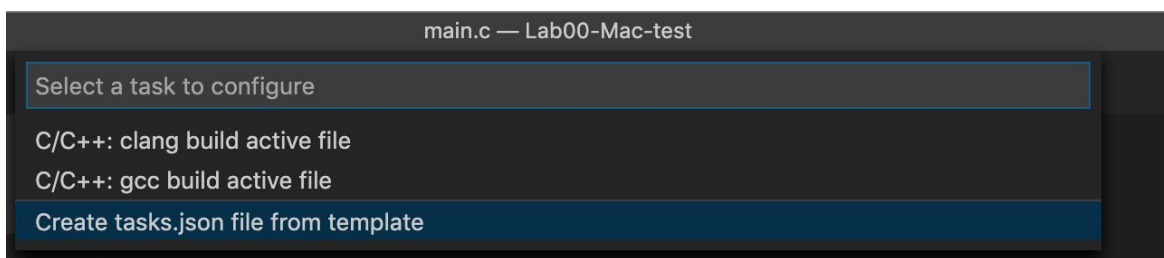
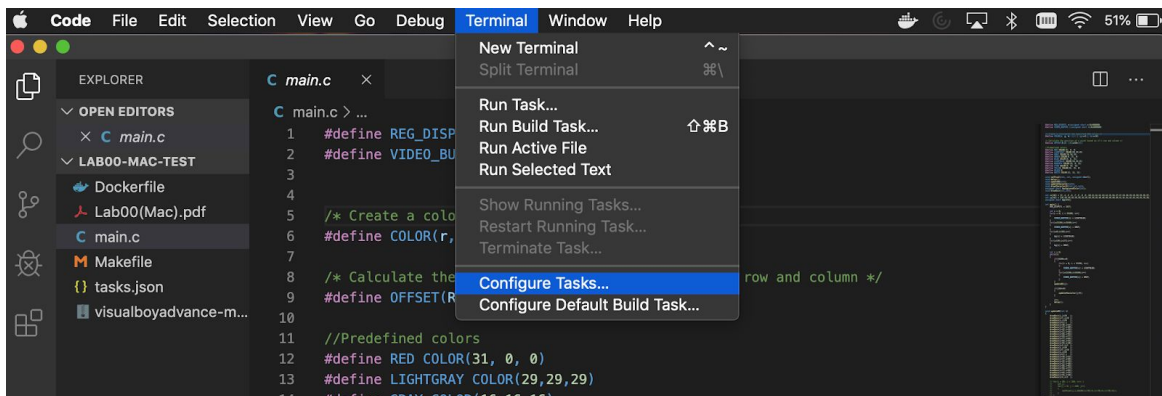
## Part 3: VSCode

Visual Studio Code is the text editor of choice for this class. We highly recommend you use this editor. If you do not already have VSCode, you can download it here:

<https://code.visualstudio.com/download>

Open VSCode, and in the Welcome tab, under Start, select "Open Folder...". Open the Lab00-Mac folder which has the Makefile, main.c, tasks.json, etc.

In the top toolbar, under Terminal, select Configure Tasks and then select "Create tasks.json file from template".



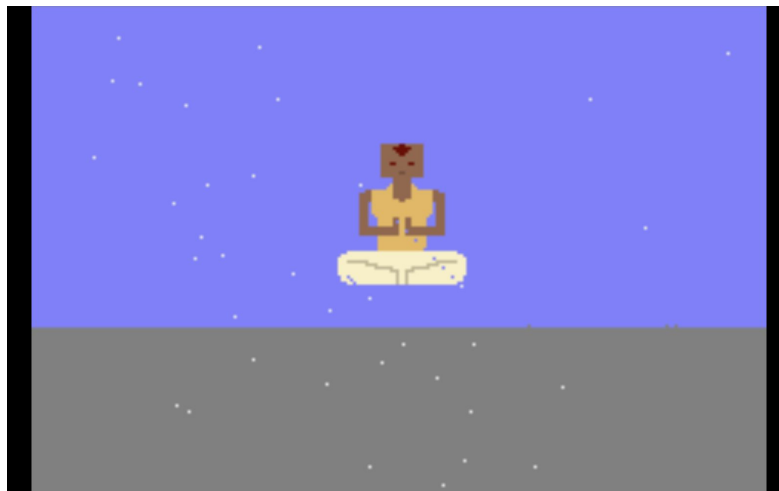
Then, select others. You'll see a new and different tasks.json exists under a .vscode folder. Replace the contents of this tasks.json file with the contents of the tasks.json file you edited earlier (i.e. copy and paste all of the contents of the tasks.json you edited into this new tasks.json file). Save and press cmd + shift + b. This should build your project.

This first compilation process will take some time because a Docker image is being

downloaded from Dockerhub (don't worry about the nitty gritty details of this). **All subsequent builds will not take this long** (whew). In the terminal output in VSCode, you should see something like this for the very first time you build:

```
> Executing task: docker run --rm -it -v ${PWD}:/gba aaaronic/gba-compiler:1.0 <
Unable to find image 'aaaronic/gba-compiler:1.0' locally
1.0: Pulling from aaaronic/gba-compiler
9cc2ad81d40d: Already exists
02c01b68baa6: Pull complete
49113593f45f: Pull complete
dc2287d88de6: Pull complete
f8760358be62: Pull complete
Digest: sha256:4fbb0128322187b9b9bfc4809bfc05c6f6e151dc90523723f2488e8c1ff41b751c
Status: Downloaded newer image for aaaronic/gba-compiler:1.0
/opt/devkitpro/devkitARM/bin/arm-none-eabi-gcc -mthumb-interwork -marm -mlong-calls -O2 -Wall -pedantic -Wextra -std=c99 -save-temps -D_ROM=Project.gba -D_VBA=C:\Users\admin\Desktop\visualboyadvance-m.exe -c main.c -o main.o
/opt/devkitpro/devkitARM/bin/arm-none-eabi-gcc main.o -specs=gba.specs -mthumb-interwork -marm -mlong-calls -lm -o Project.elf
/opt/devkitpro/devkitARM/bin/arm-none-eabi-objcopy -O binary Project.elf Project.gba
/opt/devkitpro/tools/bin/gbafix Project.gba
ROM fixed!
```

Once the build is complete, you should see something like the following pop up:



If you do, congrats, follow the submission instructions :) If not, recall, you need to have Docker Desktop running to build your code! If this is not your issue, notify a TA!

## Submission Instructions

Zip up the entire sample project folder, including all source files, the Makefile, the Dockerfile, and everything produced during compilation (**including the .gba file**). Submit this zip on Canvas.

Name your submission **Lab00\_FirstnameLastname**, for example: **“Lab00\_MarieZimmerman.zip”**.