

Decision Trees

Graphviz Installation Instructions

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1 Foreword

This guide should be used if you choose to work on the Decision Trees project locally (i.e, not on a department machine, over SSH, or over FastX). Decision Trees makes use of an external library that runs differently on each operating system. In order to ensure that you can work locally and that our support code will continue to function, **it is therefore imperative that you follow these instructions exactly**. Failure to do so will result in the Decision Trees support code throwing all kinds of nasty errors that you won't be able to debug, and which will be extremely difficult for TAs to debug.

If you encounter any problems during setup, please first go back and make sure that you've followed the instructions exactly as detailed in this document. If it still doesn't work, feel free to go to hours or post on Piazza!

2 What is Graphviz?

Graphviz is a library designed to visualize algorithmically generated trees and graphs with arbitrary numbers of nodes and children. As it turns out, visualizing non-binary trees is computationally a really hard thing to do! ¹

Luckily, Graphviz can help by generating these trees for us. The Decision Trees support makes heavy use of Graphviz to visualize your decision trees, and as such, requires some setup if you want to work locally on your own machine.

¹For the curious, non-binary tree visualization is a problem that has been proven to be NP-Complete and NP-Hard! Learn more here ([link](#)).

3 Windows Setup Instructions

3.1 Downloading the Program

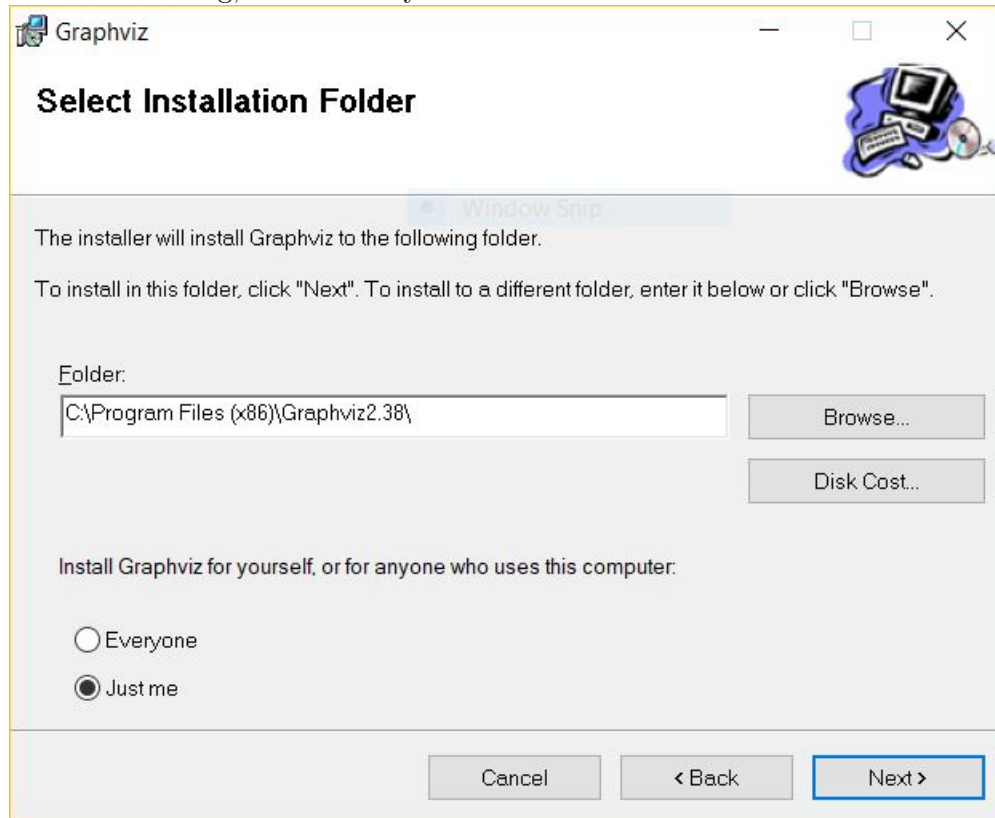
Important! Make sure that you use only the version linked below. Any other version of the software, installed via any other method, cannot be guaranteed to work.

Download the Graphviz installer here (link).²

3.2 Installing the Software

1. Open the installer you just downloaded.
2. At the welcome screen, click Next.
3. At the Select Installation Folder window, ensure that the installation path under “Folder” is: C:\Program Files (x86)\Graphviz2.38\. You are free to choose whether you want to install for all users or just for yourself.

Before continuing, ensure that your screen looks like this:



²If this link doesn't work, go to https://graphviz.gitlab.io/_pages/Download/Download_windows.html and download graphviz-2.38.msi

Click next when you are done.

4. Click Next again to start the installation. If a User Account Control window appears, click Yes to give the installer permission to write to disk.
5. When the installer completes, click Close to exit.

4 macOS Setup Instructions

To install Graphviz on macOS, you will need to first install a package manager called Homebrew. A package manager is just a piece of software that makes it easy to install other software, particularly command-line software, without having to download .dmg files and run boring, slow installers.

Install Homebrew by running the following command in a terminal (all as one line—you may need to re-type instead of copy/pasting!):

```
/usr/bin/ruby -e "$(curl -fsSL  
https://raw.githubusercontent.com/Homebrew/install/master/install)"
```

Once Homebrew has been installed, simply execute `brew install graphviz`.

5 UNIX Setup Instructions

On a UNIX machine, use your built-in package manager to install Graphviz. For most distributions, this will be apt. Install Graphviz by executing `sudo apt-get install graphviz` in a terminal.

6 Testing Script

At this point, you should have successfully installed Graphviz. To double-check that your installation is working properly, we are providing a testing script that you may use to determine if your installation was successful.

To use this testing script:

1. Copy the .zip file containing the tester script and helper data from our course directory at `/course/cs0160/lib/decisiontree-graphviz-tester.zip` to your local machine.

Important! While you are free to copy the tester to any folder on your local machine, please do *not* copy the tester to the same folder that contains your project files—or if you do, make sure that you delete the tester before you hand in your project. Failure to do so will result in a deduction.

2. Unzip the tester.

- (a) On Windows, right-click on the file and select “Extract All”. Follow the prompts to determine the location of the unzipped files.
 - (b) On macOS, double click on the .zip file. The contents will be extracted to the same folder containing the .zip file.
 - (c) On Linux, navigate in a terminal to the folder that contains the zip file and execute `unzip decisiontree-graphviz-tester.zip`. The files will be copied to the same folder containing the .zip file.
3. Run the tester.
- (a) On Windows, double-click on the file called “run-windows.bat”.
 - (b) On macOS or Unix, navigate in a terminal to the folder containing the unzipped files and execute `./run-unix`. If you encounter any error messages relating to a non-executable file, execute `chmod +x run-unix` and then run the tester again.
4. Follow the prompts in the tester. If the tester reports success, you should have noticed that a small decision tree .png file was created in the folder containing the tester. Feel free to open the file and gaze at the magic of Graphviz!

If you encounter any trouble, the tester will attempt to alert you to the cause of the problem. It likely means that something went wrong installing Graphviz.