INSTALLING TAGE on WINDOWS for CSc-165

1. Download and Install Java JDK version 17

This is available on the Oracle website. You need the *JDK*, not just the JRE.
After installing, look for where Oracle put it. Usually, that is `C:\Program Files\Java\jdk-17`

2. Modify your PATH environment variable

Go into the Control Panel ► System ►Advanced System Settings ►Environment Variables.
Under *System Variables*, open the PATH variable.
There is likely to be an entry that reads: `C:\Program Files\Common Files\Oracle\Java\javapath`
Replace that entry with Java's "bin" folder. Usually, that is `C:\Program Files\Java\jdk-17\bin`

3. Create the JAVAGAMING folder to hold OpenGL-related libraries

preferably: `C:\javagaming` Create this folder.

4. Copy the JAVAGAMING libraries from the 5029 lab to your machine

In the RVR-5029 lab, copy the contents (5 folders) inside: `C:\javagaming` to a thumb drive.
Or, download it from the CSc-165 Canvas page, or the instructor's CSc-165 webpage.
Copy those five folders into the `C:\javagaming` folder on your machine.

5. Add the JINPUT library to your PATH environment variable

Go back into the PATH environment variable (as you did earlier in step #2).
Add the following entry: `C:\javagaming\jinput\lib`

6. Create a CLASSPATH variable (if you don't already have one)

Go back into the Control Panel ► System ►Advanced System Settings ►Environment Variables.
Under *System Variables*, see if there is a variable named CLASSPATH.
If there isn't, then create one by clicking the "New…" button, then
in the "name" field, type in CLASSPATH. In the "value" field, type in a period ("**.**") by itself.

7. Add JOGL, JOML, JINPUT, JBULLET, and VECMATH to the CLASSPATH variable

While still in the Environment Variables, open up the CLASSPATH variable by double-clicking it.
You may see a table entry tool, or you may see the previous dialog box from step 6(a).
Add entries for the five library .jar files, after the single "**.**" entry. These should be *full paths*.
The entries would look like this:

```
.
C:\javagaming\jogl\jogamp-fat.jar
C:\javagaming\joml\joml-1.10.5.jar
C:\javagaming\jinput\jinput.jar
C:\javagaming\jbullet\jbullet.jar
C:\javagaming\vecmath\vecmath.jar
```

If you are entering them in the single line dialog box, separate them with semi-colons, like this:
`.;C:\javagaming\jogl\jogamp-fat.jar;C:\javagaming\joml\joml-1.10.5.jar` *etc.*

8. Copy the GRAAL libraries from the 5029 lab to your machine

In the RVR-5029 lab, copy the GRAAL contents (1 folder & 5 jar files) inside: `C:\Program Files\java`
to a thumb drive. Copy all of them into the `C:\Program Files\java` folder on your machine.

9. Add the GRAAL libraries to the CLASSPATH variable

Go back into the CLASSPATH environment variable (as you did earlier in step #7).
Add the following entries: .

```
c:\Program Files\Java\js-scriptengine-23.0.1.jar
c:\Program Files\Java\graal-sdk-23.0.1.jar
c:\Program Files\Java\truffle-api-23.0.1.jar
c:\Program Files\Java\icu4j.jar
c:\Program Files\Java\graaljs.jar
```

Note: We won't be using GRAAL until week 6.
So steps 8 and 9 (above) can be delayed until then, if necessary.

Note: changes to environment variables don't take effect until rebooting.
(alternatively, you can open a new command window and work from there)

So, after performing the installation steps, above, it is recommended that you reboot your machine before attempting the test shown below.

Test your installation:

1. Download and uncompress the "tage_build" zip folder.
2. Open a new command window and migrate to the "tage_build" folder.
3. Type "compileTAGE" – this should compile TAGE; there shouldn't be any errors or warnings.
4. Download and uncompress the "Hello Dolphin" zip folder.
5. Inside the "tage_build" folder is a subfolder named "tage". Copy that into the "HelloDolphin" folder.
6. Open a new command window and migrate to the "Hello Dolphin" folder.
7. Type "compile" – this should compile the dolphin game; there shouldn't be any errors or warnings.
8. Type "run" – a dialog box should appear labeled "Choose Display Settings".
9. Click "OK" in the dialog box.
10. A rotating dolphin should appear in a large window.
11. Click in the dolphin window, then press "2". The dolphin should change to wireframe.
12. Push the dolphin window aside and look in the command window behind it. There shouldn't be any error messages. There might be an "info" warning about initializing a HIDI2C Device.
13. Click back in the dolphin window, then press "ESC". The dolphin program should terminate.

The "compile" and "run" .bat files provided in the "HelloDolphin" program can be used throughout the semester in your CSc-165 projects.

If you are also enrolled in CSc-155, completing these installation steps also prepares your machine for that course as well.

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