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How to version your code using github desktop:

Using Github desktop, we can version our code locally, then push it to the Github cloud server. We do this by first creating a repository, where our code versions are stored on our machine locally.

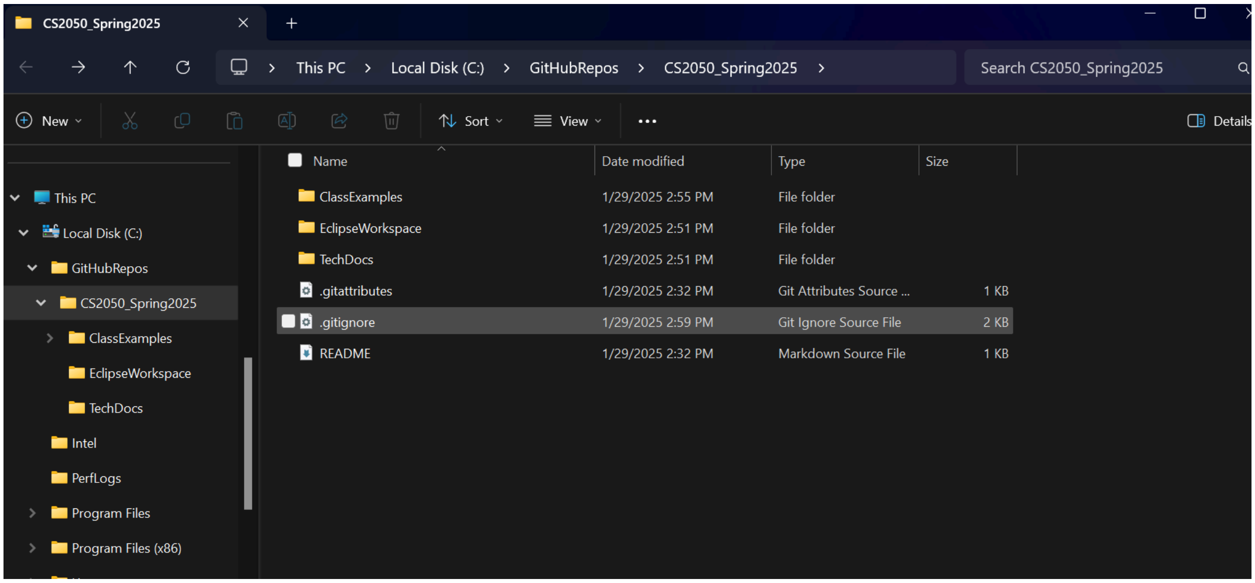
Github desktop makes this super easy, and upon opening the program for the first time will prompt us to select a file path for our local repository, mine was created under C:/GitHubRepos , just a simple folder created on the local drive.

Once we publish our repository, we can see how it is shown on the Github server, note that at this point what we are looking at is fairly naked. Now we can edit and access the files that exist in this repository to edit and change code, as well as push these local changes.

When we alter a file in our repository on Github, we can choose after to hit the button "Commit to changes", this updates the existing code in our repository and posts a new version.

Note that we can do this with any code included in the repository, and as we update our repository and push these new versions using Github, we can keep an updated version of the code on a cloud server as opposed to just our local machine.

1.2



Name	Date modified	Type	Size
ClassExamples	1/29/2025 2:55 PM	File folder	
EclipseWorkspace	1/29/2025 2:51 PM	File folder	
TechDocs	1/29/2025 2:51 PM	File folder	
.gitattributes	1/29/2025 2:32 PM	Git Attributes Source ...	1 KB
.gitignore	1/29/2025 2:59 PM	Git Ignore Source File	2 KB
README	1/29/2025 2:32 PM	Markdown Source File	1 KB

1.3 Describe the parts of creating a program in Java, include source code, byte code, editing, compiling, and running include a screenshot of your two files on your local computer that were created for the hello java program

First we have to create our project in Eclipse, in order to do this we hit File > New, in the new window we select java project, and hit next.

In this next window it's important to make sure that our java runtime environment and our jdk versions match, otherwise on windows 11 we get the classic `java.lang.ClassNotFoundException:`

In our new window that opens we can now write our source code, where we can write and edit each individual line of code, before we compile our human readable source code into bytecode, which is readable by a computer. Note that it is important to run your program that you create prior to compiling to ensure that it runs properly. Running is the process of a computer reading what code you have written that has been compiled, and executing it.

2.1.1 Explain desirable difficulties and how they relate to this class and your future career.

Desirable difficulties are similar to doing workouts with weight, you need to have the resistance to really activate your brain. These difficulties shouldn't be impossible to overcome, but should really strain you, and give you a chance at the most possible growth.

2.1.2 Explain the difference between learning and performing.

Performance is just the short term demonstration of your knowledge in a certain setting, its measurable and observable. While learning is the always moving process of discovering, understanding, and teaching others in order to best apply your understanding of something in relevant areas.

2.1.3 Summarize three strategies you could incorporate in your learning to help you learn different languages, technologies and methodologies.

I would love to try spacing in a more deliberate way, spacing is the dispersion of practice over longer areas of time in order to let your brain forget about the task, causing the loss of autopilot and increasing your skill.

I would also love to try variance! Variance is the idea that practice needs to come in different forms with constant changes, so that your brain better understands all of the different chances for your knowledge to apply.

2.2.1 Explain how ai like chatgpt can be used in order to assist your learning

Ai can be used in many ways to assist learning! The most convenient is asking for demonstration of a topic or a skill that you may have no clue how to do yourself, or to ask for generative flashcards or explanations of in depth skills on a certain topic, ai can be used as an on demand teacher for very niche and specific topics, as long as you are able to properly fence them through your own understanding first.

2.2.2 Explain how ai could be used in a way that would hinder your learning

Ai can hinder your learning in many ways, the most obvious are substitutions for your own thinking, for example having ai answer questions directly, or copying work that you do not understand from an ai generative software. While you can use ai to assist in your learning, you have to understand that you must use your brain as much as you can throughout the process of learning.

2.2.3 What do you think is meant by not blindly copying and pasting code blindly from explanation websites like stack overflow or ai tools like chatgpt

Well obviously we mean that you should not blindly copy work as this hinders your learning, and more importantly this hinders your application skills. The more that you blindly copy work without understanding, the further behind you put yourself when it comes to learning the skill.

2.2.4 A.I. Tool Usage

Tool: Microsoft Copilot (https://copilot.microsoft.com/)

Query: Describe git and github and the benefits of using both. Provide online resources in order for me to learn more

Output Summary: Git is a version control system designed to handle everything from very small to very large projects with speed and efficiency. It allows multiple developers to work on the same project simultaneously without overwriting each other's work. Github is a cloud based hosting service that lets you manage git repositories, this adds a layer of convenience and features.

Tool: Chat GPT (https://chatgpt.com/)

Query:Describe git and github and the benefits of using both. Provide online resources in order for me to learn more

Output Summary: “Git is a distributed version control system that helps track changes in files, especially in software development projects. It allows multiple developers to work on a project simultaneously without interfering with each other's work. GitHub is a cloud-based platform that provides a web interface to Git repositories, allowing teams and individuals to host and share their code. It integrates Git with additional features that make collaborating on code easier.”

Tool: Google Gemini (https://gemini.google.com/)

Query:Describe git and github and the benefits of using both. Provide online resources in order for me to learn more

Output Summary: “Git is a version control system. Think of it as a super-powered time machine for your code. It tracks every change you make to your files, and can return to previous versions of them. GitHub is a cloud based platform that provides an interface to git repositories, allowing teams and individuals to host and share their code.”

2.3.1 Give one tip from each section to help you communicate and collaborate with your team this semester

Become a successful collaborator:

To become a successful collaborator it's important that you think out loud, and allow yourself not to know things, as well as showing your process! All of these are critical to your team members understanding how you work and handle problem solving.

Communicate to pre-empt conflict:

It’s often better to enter into all collaborative settings by sometimes over communicating, and making sure that you provide even more context than is actually needed in order to avoid the problems that might arise from project changes.

Remember that you’re all on the same team:

It’s easy to forget that everyone is working toward the same goal, as everyone struggles for their department area to be heard on a project. It’s super important to always assume positive intent for every conversation! Getting lost in wanting to be heard is easy to do, and we should always assume that everyone wants the best positive outcome, and is playing for the team.

Practice active listening:

Active listening helps us better interpret and understand what we need to in order to get the most out of our discussions with others. It is absolutely critical to mentally engage with what's being spoken between

3.1.1 What is the difference between a class and an object

Class vs. Object:

A class is just the blueprint for building an object, similar to building a house, we can use a class ‘blueprint’ in order to build many houses, and our object is a specific instance of that class.

State and behavior:

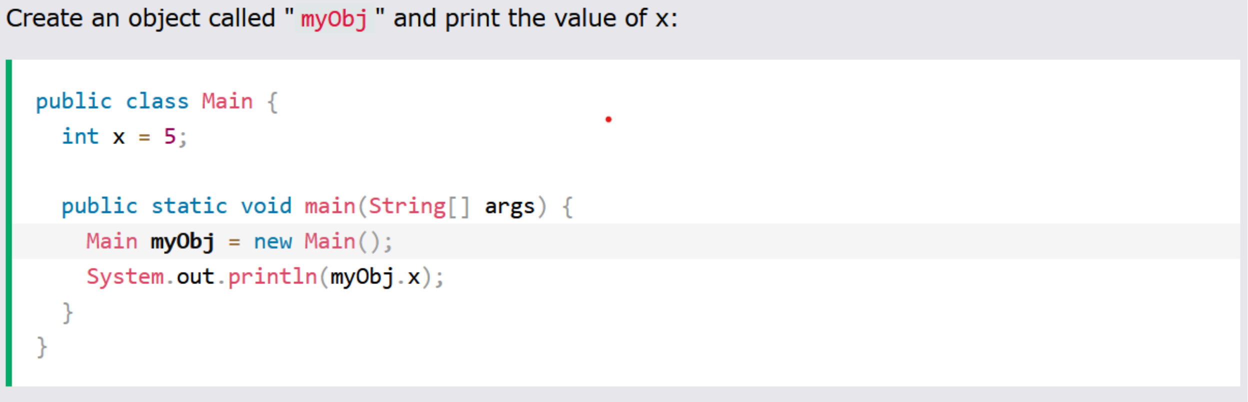
‘State’ refers to the state of an object in its ‘current’ condition or its characteristics as it exists at the current time, in order to decide this we look at its variables, and how they are assigned.

For example, we could have the ‘car’ object, and its state would refer to things like the color red, or how many tires it has.

‘Behavior’ is actually very intuitive, its the way that an object behaves or interacts with other objects or fields.

How to create an object from a class, (Instantiation!):

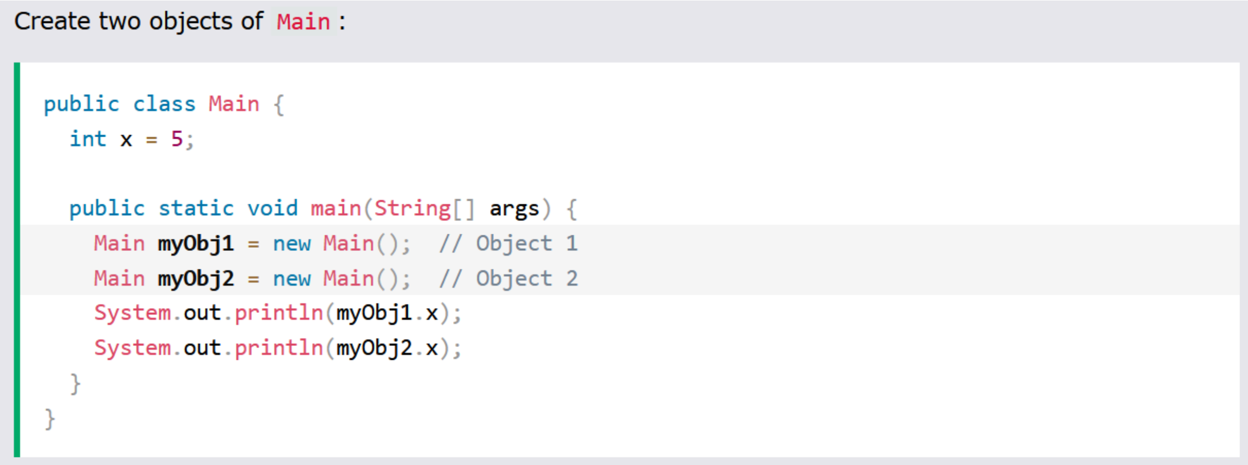
Instantiation is done by specifying the class name, then the object name, and using the keyword ‘new’


Create an object called " myObj " and print the value of x:

```
public class Main {
  int x = 5;

  public static void main(String[] args) {
    Main myObj = new Main();
    System.out.println(myObj.x);
  }
}
```

We can also create multiple objects from the same class, like so:


Create two objects of Main :

```
public class Main {
  int x = 5;

  public static void main(String[] args) {
    Main myObj1 = new Main();  // Object 1
    Main myObj2 = new Main();  // Object 2
    System.out.println(myObj1.x);
    System.out.println(myObj2.x);
  }
}
```

3.1.2 Constructors

A constructor is a special method within a class that is called automatically when an object of that class is created. This allows you to initialize all of the object's properties with values or placeholder values as soon as the object is instantiated.

A constructor always has the same name as the class it belongs to, and a method can have any name. A constructor also does not have a return type. A constructor is also called immediately whenever an object is created!

The difference between a default constructor and an overloaded constructor is fairly simple, overloaded constructors allow for different instantiations of the same object based on the available information that is provided for them. Typically a basic constructor has no return type, and may exist alongside other instances of an overloaded constructor.

Constructors are invoked using the new keyword, and this creates a new object of the class. For example:

```
class Person {

        String name;

        public Person(String name) {
        this.name = name;
        }
}
// Creating a new Person object using the "new" keyword

Person person1 = new Person("John");
```

Essentially, whenever you write `new ClassName(arguments)`, the "new" keyword automatically calls the appropriate constructor of the "ClassName" class to initialize the object with the provided arguments.

Reference variables are used to hold the memory address of an object on the heap. It does this INSTEAD of holding the actual value,

The purpose of this is to allow these reference variables to interact with objects, essentially like writing blank checks that we can fill with actual values or information later.

```
class Dog {
        String name;
        Dog(String name) {
        this.name = name;
        }
}

public class Main {
        public static void main(String[] args) {
        Dog myDog = new Dog("Buddy"); // myDog is a reference variable
        System.out.println(myDog.name); // Accessing the object's data using the reference
        }
}
```

In java objects are passed by value, where the value of the object is its location in memory. Then when we pass that object as an argument through a method, a copy of that reference is created, but both of these point to the same object, which means that this object is subject to any of the changes that we make.

3.1.3 Instance Variables and Methods

Instance variables are declared inside of a class, but outside of any methods, this is convenient for us because any time that an object of that class is created, each individual object of that class stores a copy of the included variables, which we can then edit specifically as needed.

A static method or variable belongs to the class itself, meaning that there is only one copy of it shared across all instances of that class, this also lets us access it directly through the class name itself.

Typically these are used to store data that is relevant to the entire class, like counters or constants that need to be shared across all of the objects of a class.

4.1 Ways to improve developer documentation

Being concise when we write! Often it’s super easy to make the mistake of using a lot of technical terms in our documentation that only deconstruct the point to a place where it's impossible to understand what is actually going on. Instead it is always better to break down the point into pieces so simple that anyone could understand what is going on.

Always avoid using technical jargon! Super self explanatory!

Include code snippets! These help explain what is actually happening in the code that you write. Sometimes there really isn’t any substitution for just the straight code from the program or project that you are writing.

Add media! Include pictures, lectures, and other people's explanations about the topic!

4.2

These four different approaches all engage different parts of our brain and help not only understand the topics, but also help our application of the topics to different but relevant areas.

5.1 Reflection

I faced challenges all throughout this exploration, as I haven't written code in about a year prior to this class. Some specifics were getting animals placed into the array properly, and how to actually read the input from the file that was given to the program.

I can confidently say that I have learned more in the last 90 days than I had in my prior 1050 course.

The difficulty level of your course has caused me to push myself very hard to understand concepts and be able to recall them with relative ease. However I think that my performance will suffer, as the amount that I am learning does cause me difficulty with really knowing the minutiae about the topic.

5.2 AI Responsibility

Using AI responsibly was somewhat difficult, but very rewarding when done correctly. By asking different AI models to explain and give examples of difficult spots in code I was able to solve problems that I otherwise wouldn't have been able to solve. Like my file input which was half help from my study group, and looking at multiple different examples of how to parse the information from a text file. While the slides were helpful for a general explanation, the actual application of the concepts was often very difficult and time consuming to do and try individually, and while a large portion of my code doesn't work, it was nice to learn how polymorphism works in concept.

5.3

I hate to say this but the hardest part of this assignment was just learning how to code again mostly from scratch, alongside showing the way that polymorphism could work in conceot. I had a lot of trouble actually getting all the different parts of my code to work together instead of just independently, but I gave the effort that I had to it, and am actually decently proud of how it turned out.

5.4 Time Management

After doing this assignment I'll focus more on starting the assignment of the actual module really early before it is due, and I'll work further ahead in the modules and the guided exploration of what is listed, as I clearly needed some extra time to complete this assignment.

Loose code examples: