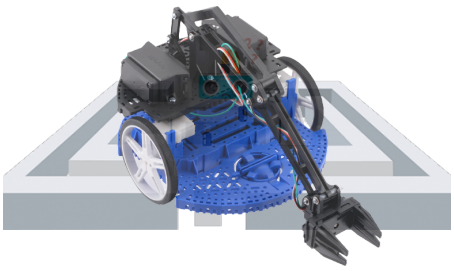
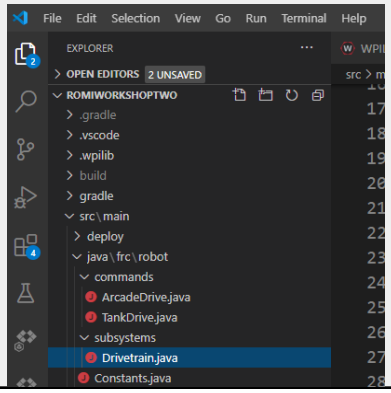
ETECH Romi Workshop #2: Teleoperated Maze



Objective 1: Get Joystick to Move Your Robot!

- **Task 1A:** Go to Team Discord and copy the link for the new Starter Code
- **Task 1B:** Open VSCode, and clone the shared repository
  - Type **[CTRL] + [SHIFT] + [P]** to open VSCode commands
  - Type `Git clone`
  - Paste the appropriate GitHub repository link
  - Save to a new folder on your computer
- **Task 1C:** Connect your computer to your Romi's WIFI network
  - The default SSID name is "WPILib…." Or something like "WHITE_ROMI"
  - The default password is: **`WPILib2021!`**
  - (You can check that the Romi firmware is up-to-date by going to `10.0.0.2` in your browser)
- **Task 1D:** Deploy your code into your Romi!
  - Click the **[F5]** key
- **Task 1E:** Plug in your joystick controller into a USB port on your computer
- **Task 1F:** In the simulation window that pops up:
  - Drag your controller to the 0 port
  - Click on **"Teleop"**
- **Task 1G:** Test out the driving!
  - How is it???

Where do I find the different files in my code?
On the left-side of VSCode, you will see the directory of folders and files that make up our robotics Java project:



Objective 2: Get both wheels of your Romi to Move!

Task	What to Code	Where to Code It	
Task 2C	*Declare and construct a right motor (Spark) and connect to port 1*	*Look in:* `src\ main\ java\ frc\ robot\` ***subsystems\ Drivetrain .java***	Line 19
Task 2D	*Add the rightWheelSpeed to the tankDrive() parameters*		Line 26
Task 2F	*Make the right wheel move too (just like the left wheel in the line above)*		Line 35
Task 2H	*Create a field variable for the rightPower*	*Look in:* `src\ main\ java\ frc\ robot\` ***commands\ TankDrive .java***	Line 22
Task 2I	*Add a DoubleSupplier rightPower parameter to the constructor method*		Line 26
Task 2K	*Store the rightPower parameter into the field variable*		*Line 36*
Task 2L	*Initialize the left motor to be still when the code starts*		*Line 46*
Task 2M	*Update the execute() method to include the rightPower*		*Line 54*
Task 2N	*Make the right wheel stop moving when the command ends*		*Line 62*
Task 2P	*Make sure the TankDrive object gets joystick values for the right wheel speeds*	*Look in:* `src\ main\ java\ frc\ robot\` ***RobotContainer .java***	*Line 28*

- **Task 2Q:** Test out the driving now! Fix any small errors that still make it challenging to drive the robot.
- **Task 2R:** How fast can you make it through the maze?
    - You have 30 seconds!

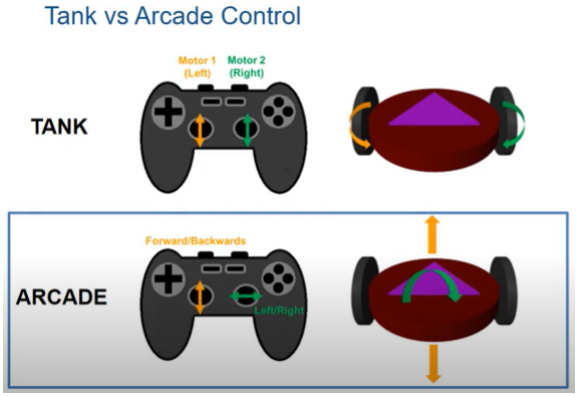
What is a `double` ?
A variable type that can store decimal numbers.

What does f(x) mean?

- In math class, f(x) = 2x + 1 is read as “the function, f, of x is equal to the expression 2x+1”
- The f is the function name
- The x is just the variable that is needed in order for f to generate an answer
- What does f(1) evaluate to? f(2) ?
- When we write Java functions, we also need a function (or **“method”**) name and a list of the inputs (or **“parameters”**) that are needed to properly run the function.
- In math class, you are supposed to evaluate the answer. In Java, we have the computer do that for us! You just need to know how to properly ask the computer to run the functions.

Objective 3: Control your robot with Arcade-style driving!

What if you wanted one joystick to drive forward and the other to do turning?



Task	What to Code	Where to Code It	
Task 3A	*Create an arcadeDrive() method to control*	*Look in:* `src\ main\ java\ frc\ robot\` ***`subsystems`***`\` ***`Drivetrain.java`***	*Line 39*
Task 3B	*Using the TankDrive command class as an example, complete the ArcadeDrive command class*	*Look in:* `src\ main\ java\ frc\ robot\` ***`commands`***`\` ***`ArcadeDrive.java`***	*Line 11*
Task 3C	*Declare and Initialize an ArcadeDrive object. Look at the TankDrive method above for inspiration.*	*Look in:* `src\ main\ java\ frc\ robot\` ***`RobotContainer.java`***	*Line 33*
Task 3D	*Change the default command to the TankDrive object you just created.*		*Line 61*

- **Task 3E:** Try the new ArcadeDrive. Can you navigate better with TankDrive or ArcadeDrive?
- **Task 3F:** Retry the Maze with your new driving skills!

For Task 3A, what speeds should I tell my motors ?

- When traveling forward, what should both motors do?
- When turning, what should both motors do?

	Forward	Turn
Right Motor	+	+
Left Motor	+	-

- Note that each motor should use your forward parameter AND your turn parameter. Make sure they're different based on what they turn.