Detroit FTC Kickoff

September 9, 2017

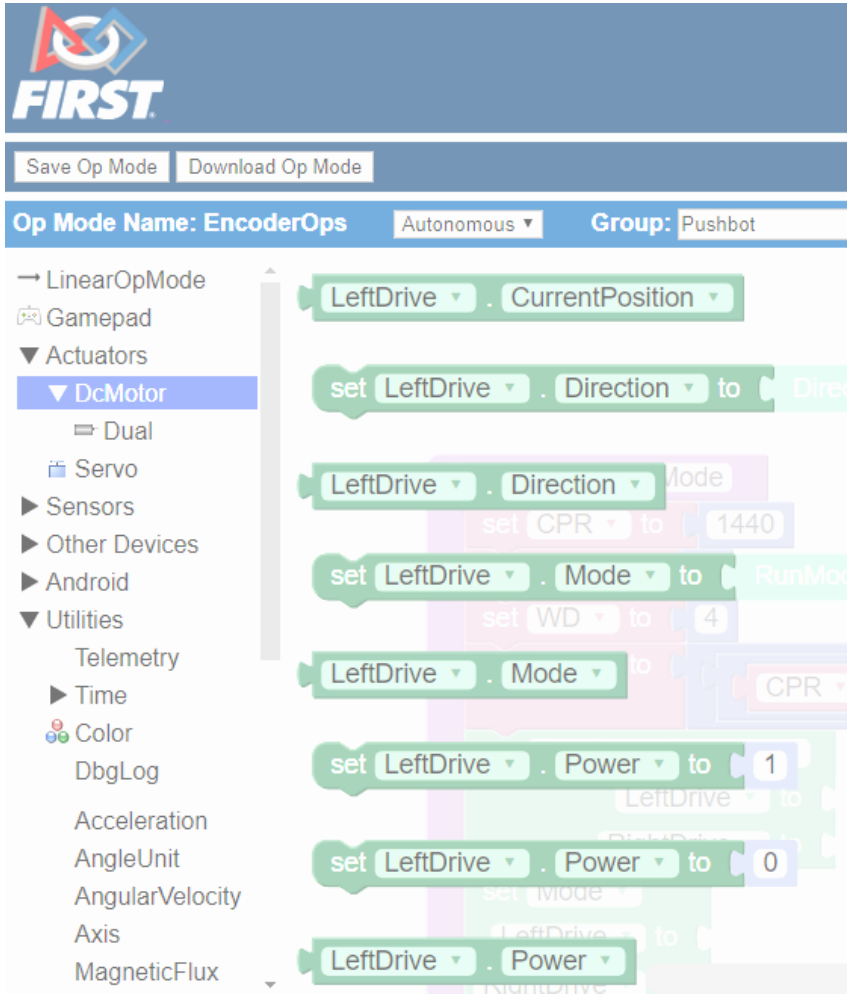
FRC Team 503
FROG FORCE

Agenda

- Go over basic programming environment
- Advantages of Using Google Blocks
- Walk through simple autonomous: Driving By Time
- What are Sensors?
- Intro to the Touch Sensor
- Modify autonomous to use the Touch Sensor
- Intro to the Color/Range Sensor
- Modify autonomous to use the Color/Range Sensor
- Q&A

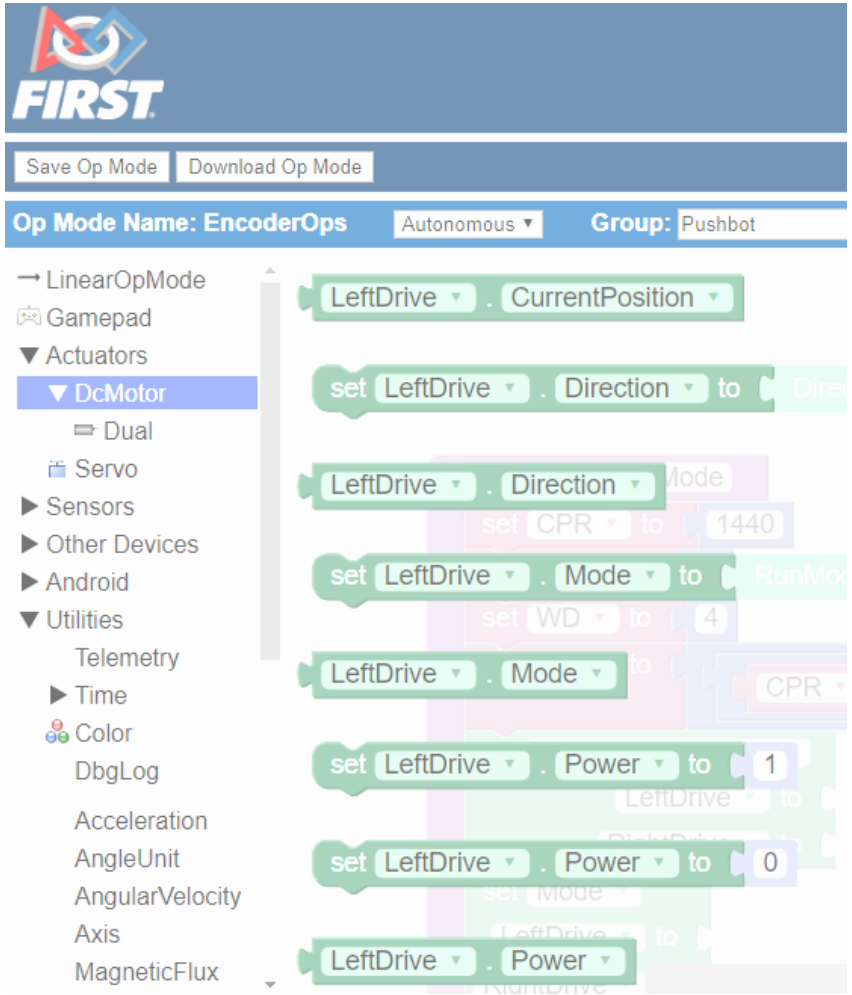
Google Blocks Environment

- How does FTC Google Blocks work?
  - Easy/intuitive – good for rookie FTC teams
  - Doesn't need Android Studio or Java (Program directly to Robot Controller)
  - Like puzzle pieces being put together
  - Basic drag and drop of blocks
  - Blocks of objects, loops, functions, variables, operations, inputs, and structure
  - Sequential order linear OpMode



Advantages of Using Google Blocks

- Does not require many steps to use
  - Browser based (Suggested: Chrome)
  - No software needed of installation
  - Does not require lots of computing power
  - Can be used on any kind of device with a browser (i.e. PC, Tablet, Chromebook)
  - Uses basic pseudo code and simple to understand
  - Do not need to learn any programming languages
  - A rookie team could practically program a basic teleop in just a couple hours



Creating a Basic Autonomous Program

- Basic operations in an autonomous program
  - Use of variables
  - Ways to use loops
  - Telemetry
  - Getting the runtime of an OpMode through telemetry
  - DC motor objects and servo objects
  - Driving a set amount of time using the ElapsedTime blocks

REV Robotics Sensors

- Where will I use sensors?
  - Can be used and programmed in both teleop and autonomous
  - Help tell robot where it is on the field
  - Very useful in autonomous for navigation
  - Much more reliable than simply hardcoding (driving just by a timer)
  - Can make programs much more consistent
  - What kinds of sensors are there?
  - http://www.revrobotics.com/content/docs/REV-31-1153-GS.pdf

Introducing the Touch Sensor

- What is the Touch Sensor?
  - Sensor has button that gives information of the state of the touch sensor
  - Pressed indicator LED
  - When not pressed: True
  - When Pressed: False
  - Plugged into Digital Channel

Driving and Stopping at a Wall Using the Touch Sensor

- Getting the state of the touch sensor
  - If and else blocks
  - Touch sensor blocks
  - Using touch sensor as an if/else condition
  - Running drive motors in the loop

Introducing the Color/Range Sensor

- What is the Color/Range Sensor?
  - Sensor sends out light and determines distance based on reflectance
  - LED white-colored light
  - Can get distance in inches and centimeters
  - Can also be used as a color sensor and light sensor
  - Plugged into I2C Bus

Driving and Stopping at a Wall with Color/Range Sensor

- Getting the distance value of the range sensor
  - Comparing logic blocks
  - Calling the value of the range sensor
  - Using range sensor as an if/else condition
  - Running drive motors in the loop

Q&A

Any Questions?

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Frog Force FTC Resources:
http://www.frogforce503.com/page-ftc-resources.html