Breaking Programs into Behaviors

What Are Behaviors?

A behavior is really anything your robot does: turning on a single motor is a behavior, moving forward is a behavior, tracking a line is a behavior, navigating a maze is a behavior. There are three main types of behaviors that we are concerned with: complex behaviors, simple behaviors, and basic behaviors.

Complex Behaviors

These are behaviors at the highest levels, such as navigating an entire maze. Though they may seem complicated, one nice property of complex behaviors is that they are always composed of smaller behaviors. This means that if you observe a complex behavior, you can always break it down into smaller and smaller behaviors until you eventually reach something you recognize.
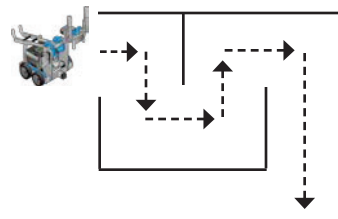
Simple Behaviors

Simple behaviors are small, bite-size behaviors that allow your robot to perform a simple, yet significant task, like moving forward for a certain amount of time. These are perhaps the most useful behaviors to think about, because they are big enough that you can describe useful actions with them, but small enough that you can program them easily from basic EV3 icons.
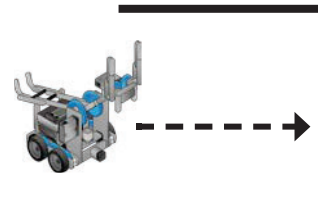
Basic Behaviors

At the most basic level, everything in a program must be broken down into tiny behaviors that your robot can understand and perform directly. In the EV3 software, these are behaviors the size of single icons, like turning on a single motor, or checking a single sensor port. While these basic behaviors are very specific and immediately recognizable, they are not always terribly useful for programming, because they are often too small, and may not even be visible in the program's output because they are too small.
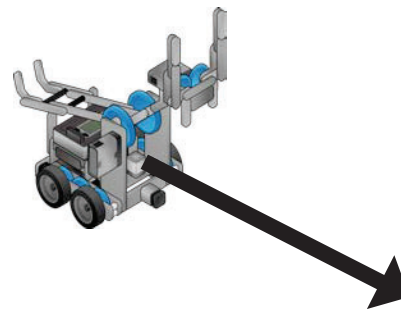
Complex Behavior:
Maze Navigation

Contains the Simple Behavior:
Move Forward until Touch Sensor is Pushed

Contains the Basic Behavior:
Turn on Left Motor in Forward Direction

Exercises

1. What level of behaviors can your robot perform directly?
2. Why is it useful to think about a robot's actions in terms of behaviors?