



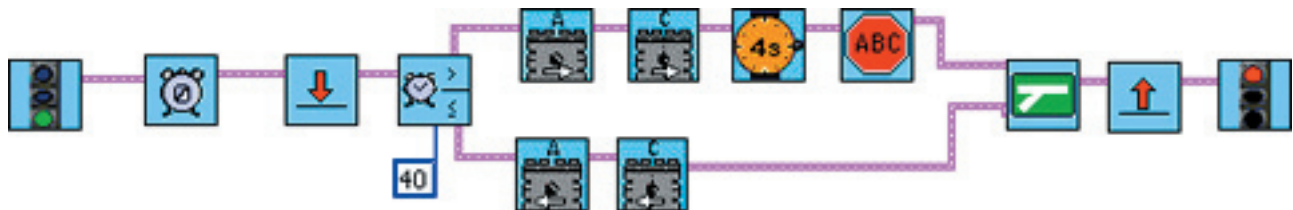
Forks

Robolab provides three types of programming structures: loops, jumps and lands, and forks. In previous activities, you have used loops to repeat the same actions several times and jumps and lands to move around in your program.

Forks, , and fork merges, , are used by robots to make decisions based on sensor inputs or on how much time has passed.

A fork allows the robot to ask a question. For example, with a timer fork, the robot asks “is the time greater than the value set in the modifier box?” If the amount of time is greater, the robot follows one fork output—that is, one set of program instructions, and if the time is less, then it follows the other fork output and another set of programming instructions. After the fork and the program icons that follow each path, you always need a fork merge, to bring the program flow back together.

As an example, this program goes backwards until the time has reached 4 seconds and then goes forward for 4 seconds:



Whenever you’re using a timer fork, you need to keep two things in mind: First, the modifier is in tenths of a second. There are 40 tenths in 4 seconds. Second, the timer starts the instant you turn your robot on, so you need to zero or reset the timer just before you use it.

In the program above, you can use the timer fork to make your robot move in reverse if less than four seconds have passed and to move forward if four seconds or more have passed. You will also have to use a jump and a land, so that at the end of the fork merge, the program jumps back to before the fork to ask “has four seconds passed yet?” and to make the decision as to which fork to take. Without the jump and land, the program will only ask the question once, make one decision, and then execute the lower output and run forever.

Many programming decisions are based on something being GREATER THAN a certain value or LESS THAN a certain value. For example, in the last activity, you made your robot go until it reached dark, based on when the light sensor value was LESS THAN the value of the threshold. The math symbol that is used to mean “greater than” is $>$ and the math symbol for less than is $<$. Two other symbols that are very similar are \geq and \leq . The symbol \geq means “greater than or equal to.” What do you think the symbol \leq means?