

## Programming Challenge

# Robot Acceleration / Deceleration

### Challenge Description, Part 1

Write a program that accelerates your robot from power level 0 to power level 127. Create an integer variable named "powerLevel" and set its value to zero. Control the robot's acceleration by incrementing powerLevel by 10 every half second. Once the robot has reached full speed, the program should end and the robot should stop.

### Materials Needed

- An open area for the robot to drive

### Notes

- How many variables will you need to declare?
- What is the name of the variable?
- What value will the variable be set to at the beginning of the program?
- What control structure can you use to increment the robot's powerLevel?
- How often does the robot's speed change?
- Increment "powerLevel" using the code: `powerLevel = powerLevel + 10;`
- What happens at the end of the program?

### Pseudocode

```
begin the program
declare integer variable "powerLevel"
set integer variable "powerLevel" to zero
while("powerLevel" is less than 127)
{
    set port 2 motor to "powerLevel"
    set port 3 motor to "powerLevel"
    wait for half of a second
    increment "powerLevel" by 10
}
end the program
```

Turn the pseudocode into ROBOTC code and test it.

## Programming Challenge

# Robot Acceleration / Deceleration

### Challenge Description, Part 2

Write a program that accelerates your robot from power level 0 to power level 127 and then decelerate back down to zero. Create an integer variable named "powerLevel" and set its value to zero. Control the robot's acceleration by incrementing powerLevel by 10 every half second; once it reaches its top speed, have it slow down by decrementing powerLevel by 10 every half second. Once the robot has completed the accelerate/decelerate cycle, the program should end and the robot should stop.

### Materials Needed

- An open area for the robot to drive

### Notes

- How many variables will you need to declare? Will you need to declare another variable for the robot to slow down?
- How will you know that the robot reaches full power?
- What control structure can you use to increment the robot's powerLevel? Will you need another control structure to control deceleration?
- Increment "powerLevel" using the code: `powerLevel = powerLevel + 10;`
- Decrement "powerLevel" using the code `powerLevel = powerLevel - 10;`

### Modify the Pseudocode for this Challenge

```

begin the program
flip polarity on motor port 2
declare integer variable "powerLevel"
set integer variable "powerLevel" to zero
while("powerLevel" is less than 127)
{
    set port 2 motor to "powerLevel"
    set port 3 motor to "powerLevel"
    wait for half of a second
    increment "powerLevel" by 10
}
What happens here?
end the program
  
```

Turn the pseudocode into ROBOTC code and test it.