

OzoBlockly Editor Challenge

ORA and Ari Collaborate as a Candy Bar Confectioner

Student Guide

by Richard Born, Associate Professor Emeritus, Northern Illinois University

Introduction

Welcome to your robotics challenge lesson! In this engaging activity, you will explore the intersection of programming and robotics by using both Ozobot Ari and ORA. The primary goal of this lesson is to design a program that allows users to select their favorite Hershey mini candy bars—Milk Chocolate, Dark Chocolate, Krackel, and Mr. Goodbar—using Ari’s interactive touch screen. Then, with the help of the Ozobot ORA, these selected items will be moved into a customer ready bag, simulating real-world robotics applications in an interactive manner.

Throughout this challenge, you will learn fundamental concepts of programming and robotics, such as user input, decision-making, and automated movement. The users will have the freedom to determine how many candy bars of each type to select, enabling you to practice your coding skills while adding a creative touch to your project. This type of hands-on experience is crucial for understanding the principles of automation and robotics.

In today’s industry, robotics is transforming various sectors, including manufacturing, healthcare, and logistics. Cobots, like the Ozobot ORA, are designed to work alongside humans, enhancing productivity and safety. Your challenge mirrors real-world scenarios where robots assist in sorting, packaging, and transporting items, reflecting the efficiency needed in a modern workplace.

By participating in this challenge, you are not only developing technical skills in programming and robotics, but you are also gaining insights into how these technologies are shaping our future. Through collaboration and innovation, you will learn to solve challenges, just like engineers in the field, and prepare for potential careers in the ever-evolving tech landscape. Let’s get started and see what you can create!

Lab Setup

Figure1 shows a 4x5 grid that has been filled with “Hershey’s miniatures”. Each of the four columns contains five miniatures of that kind. Using Ari as an interface, the user then selects how many of each kind of miniature he or she wants. Allowable options are from zero to five for each kind of candy.



Figure 1

After using Ari to specify the selections, ORA then takes over and moves the selected miniatures from the grid to the bag as shown in Figure 2. This figure shows a moment in time. ORA has already moved two milk chocolates, no Mr. Goodbars, and three special dark chocolates from the grid to the bag. ORA is about to begin moving the number of krackels requested by the user from the grid to the bag. When ORA has completed the order, it moves to the ZERO position and the program ends.

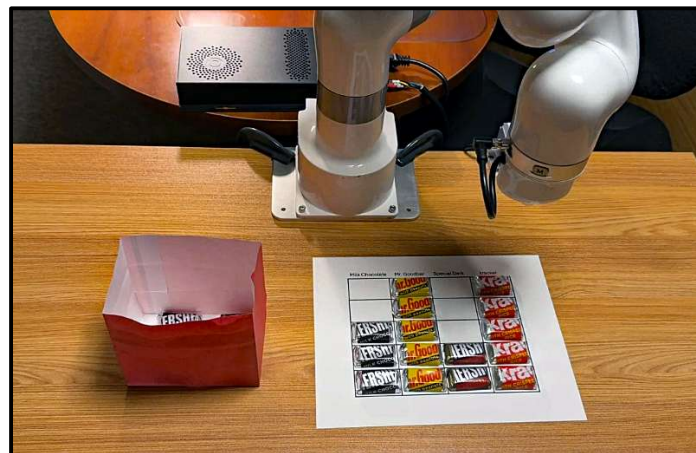


Figure 2

You should now view the accompanying 73-second video to get a good feeling for what is expected from this challenge.

Two VERY IMPORTANT Notes Regarding Safety

1. You should include the Ozobot Editor block shown in Figure 3 at the beginning of your program, perhaps right after the *Program start* block or in a function where you initialize a number of things required by your solution to the challenge. Why? When ORA is moving at a slower speed, say 20% or less, you have more time to prevent an impending collision. Of course, this also

allows a person more time to move out of the way of ORA's moving arm! This is particularly important throughout the development process while creating your program, when you are more apt to make errors in coordinate values in *move to coordinates* blocks.

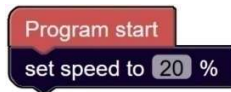


Figure 3

2. Make sure that the **Emergency Stop Button** is within easy reach. It might even be a good idea to have one student with his or her hand above the button when the program is started, in the event that it becomes necessary to instantly terminate all motion of ORA's arm and cancel any commands.

Now that you understand the mechanics of the Hershey miniatures challenge, it is time to put your programming skills into action! Collaborative robotics requires precision, logic, and creative problem-solving. Focus on building a seamless interface with Ari before coordinating ORA's movements. Remember to keep safety a priority as you test your code. Dive in, collaborate with your team, and show us how you can automate this delicious task!
