

OzoBlockly Challenge: Ozobot Does a Stair Workout

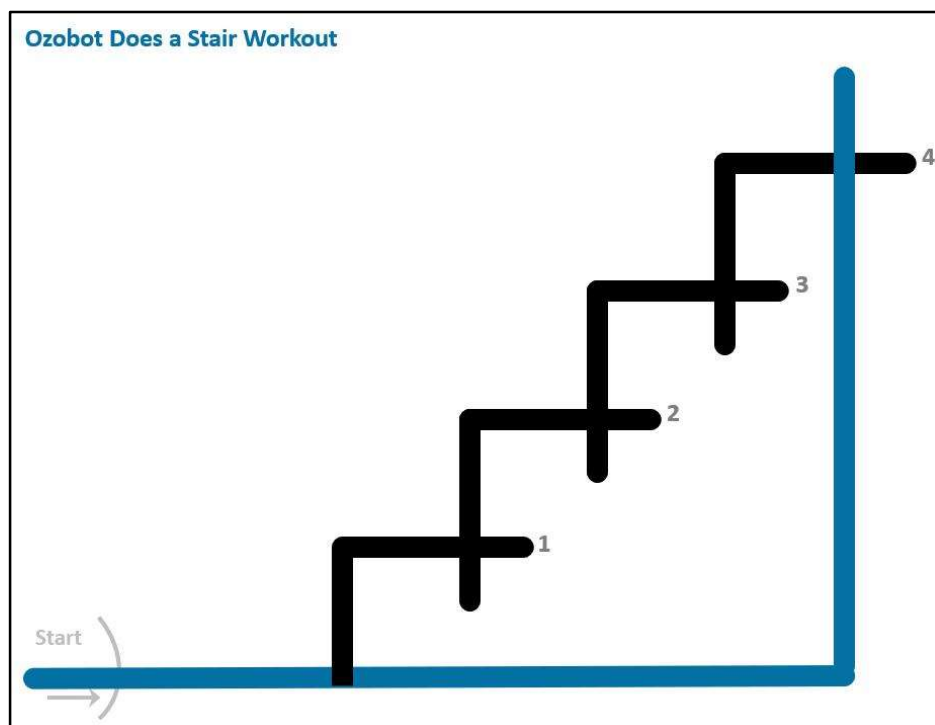
By Richard Born
Associate Professor Emeritus
Northern Illinois University
rborn2@niu.edu

Introduction

Are you one of those people who thoroughly enjoys a good workout in order to keep in shape? Perhaps you like to run to improve your cardiovascular health, or lift weights for muscular development, or maybe you climb stairs to improve your leg muscles and overall stamina.

Even if you aren't into physical workouts, this challenge will provide you with a mental workout. You will be programming Ozobot to do a stair workout, so at least he can stay in good shape!

A small copy of the map used for this challenge is shown in the figure below and can be used as a reference while reading the challenge. A larger copy, suitable for printing and using with Ozobot, can be obtained by downloading the file *StairWorkout.pdf*.



Challenge Requirements

1. Ozobot should be moving at a speed of 85 mm/s, displaying a red LED while moving.
2. Ozobot should be started at the location in the bottom left corner of the map labeled “Start” and facing the direction indicated by the gray arrow.
3. Ozobot’s stair workout is as follows:
 - a. Climb stair 1, turn around, climb back down, and turn around at the line-end to the left of “Start”.
 - b. Climb stairs 1 and 2, turn around, climb back down, and turn around at the line-end to the left of “Start”.
 - c. Similarly, but now do stairs 1, 2, and 3.
 - d. Similarly, but now do stairs 1, 2, 3, and 4.
 - e. Similarly, but now do stairs 1, 2, and 3.
 - f. Similarly, but now do stairs 1 and 2
 - g. Similarly, but now do stair 1.
4. Finally, turnaround at the start and let the program terminate and turn off Ozobot.

*Hint: If you find yourself duplicating similar code over and over again, you might consider making use of the **count with** OzoBlockly loop. This loop is sometimes known as a “for” loop as well.*

How many stairs in total did Ozobot climb up during his workout? Ozobot’s stair workout is related to what mathematicians call triangular numbers. (After all, the staircase forms a triangle of sorts.)