2.1.3   Tug-of-War

Challenge: Design and build a tug-of-war robot using Pilot Level 4 or Inventor Level 4 to program the robot. The objective is to pull the opposing robot over the centerline. The battle commences when both the robots are activated by a single touch sensor.

Skill Badges: [Basic Pilot]   or   [Basic Inventor]   [Basic Programming]

 Procedures:

Experimental Setup: The required materials for this Challenge include a line (electrical or masking tape) on the floor, two pieces of 6-inch long string, each with a paper clip at one end, and a touch sensor with two long lead wires.

During the competition, the opposing robots are tied together by the connecting the paper clips on the ends of the string. The paper clips are positioned over the line. The lead wires from the touch sensor are connected to Input Port 1 on both RCX's. The battle starts when the instructor presses the touch sensor (one touch sensor triggers both RCX's).

A single elimination contest will be used to determine which design wins. A draw will be declared after 10 seconds elapses without any progress.

Robot Design: The only three restrictions are:
  1) Input Port 1 must be accessible to connect the touch sensor lead wire to.
  2) You may use a maximum of two motors.
  3) Your robot must permit a piece of string to be attached (you decide how).
  4) Your robot must fit inside a cube 9 inches on a side.

Design factors to consider include gear ratios, friction, and center of mass of your robot.

Program: The program for this project is fairly simple. Your robot must wait until the touch sensor on Input Port 1 is pressed before turning on the motor(s).

Hints: Use the AC power adapter to prevent rapid use of batteries (stalling a motor will quickly drain a battery).

Grading:
  Your grade will be based 75% on performance and 25% on creativity and aesthetics.

Performance	Creativity & Aesthetics
A+: Undefeated champion	A+: Best of show
A: You win more than once	A: Outstanding
B: You put up a good fight	B: Good
C: Motors turn on when touch sensor is pressed	C: Okay
D: You have something to connect the string to	D: Nothing special
F: You don't show up to class	F: Divert your eyes!

Like always, you must receive a "B-" or better to earn the Skill Badge.