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// pseudo-code for mecanum or omni,
// with or without field-centric control (gyro)

// first define your driver interface:

// for a 3-axis joystick (Z axis is twist), do this:

forward   = -Y; // push joystick forward to go forward
right     =  X; // push joystick to the right to strafe right
clockwise =  Z; // twist joystick clockwise turn clockwise

// ... or for two 2-axis joysticks do this (Halo):

forward   = -Y1; // push joystick1 forward to go forward
right     =  X1; // push joystick1 to the right to strafe right
clockwise =  X2; // push joystick2 to the right to rotate clockwise

// or this ("tank drive" interface plus strafe):

forward   = -(Y1+Y2)/2; // push both joysticks forward to go forward
right     =  X2;        // push joystick2 to the right to rotate right
clockwise = -(Y1-Y2)/2; // push joystick1 forward and pull joystick2 backward
                        // to rotate clockwise

// ... or for a single 2-axis joystick:

forward   = -Y;
right     = (button1)? X:0;
clockwise = (button1)? 0:X;

// note: the above can only do 2 degrees at a time.
// Button1 selects Halo or Arcade.

// ... or any other driver interface scheme you like.

// If desired, use the gyro angle for field-centric control.
// "theta" is the gyro angle, measured CCW from the zero reference:

temp     = forward*cos(theta) - right*sin(theta);
right    = forward*sin(theta) + right*cos(theta);
forward  = temp;

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// now apply the inverse kinematic transformation
// to convert your vehicle motion command
// to 4 wheel speed commands:

front_left  = forward + clockwise + right
front_right = forward - clockwise - right;
rear_left   = forward + clockwise - right;
rear_right  = forward - clockwise + right;

// finally, normalize the wheel speed commands
// so that no wheel speed command exceeds magnitude of 1:

max = abs(front_left);
if (abs(front_right)>max) max = abs(front_right);
if (abs(rear_left)>max) max=abs(rear_left);
if (abs(rear_right)>max) max=abs(rear_right);

if (max>1)
    {front_left/=max; front_right/=max; rear_left/=max; rear_right/=max;}

// you're done. send these four wheel commands to their respective wheels
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