Driving with Procedures (TEAM) [SOLUTION]

As always, there are many possible variations on the control code. The code below is one possible answer. If you find that you are having difficulty controlling your rover accurately, try the EXACT code below first and tweak it as necessary.

```
with Lego;
use Lego;

procedure C8 is

  Left_Wheel  : constant Output_Port := Output_A;
  Right_Wheel : constant Output_Port := Output_C;
  Left_Rot    : constant Sensor_Port := Sensor_1;
  Right_Rot   : constant Sensor_Port := Sensor_3;

  procedure Initialize_Robot is
  begin
    -- Initialize the Wheels
    Output_Power(
      Output => Left_Wheel,
      Power  => Power_High);
    Output_Power(
      Output => Right_Wheel,
      Power  => Power_High);
    -- Initialize the Rotation Sensors
    Config_Sensor(
      Sensor => Left_Rot,
      Config => Config_Rotation);
    Config_Sensor(
      Sensor => Right_Rot,
      Config => Config_Rotation);
  end Initialize_Robot;


  procedure Go_Forward(Clicks:Integer) is
  begin
    Output_Power(Left_Wheel,7);
    Output_Power(Right_Wheel,7);
    Clear_Sensor(Left_Rot);
    Clear_Sensor(Right_Rot);
    Output_On_Reverse(Left_Wheel);
    Output_Reverse(Right_Wheel);
    while (((-1*Get_Sensor_Value(Left_Rot))+(-1*Get_Sensor_Value(Right_Rot)))/2<Clicks) loop
      if (-1*Get_Sensor_Value(Left_Rot)>-1*Get_Sensor_Value(Right_Rot)) then
        Output_Float(Left_Wheel);
        Output_On(Right_Wheel);
      else
        Output_Float(Right_Wheel);
        Output_On(Left_Wheel);
      end if;
    end loop;
    Output_Off(Left_Wheel);
    Output_Off(Right_Wheel);
  end Go_Forward;
```

2 pts – move forward procedure

2 pts – move backward procedure

```
procedure Go_Backward(Clicks:Integer) is
begin
  Output_Power(Left_Wheel,7);
  Output_Power(Right_Wheel,7);
  Clear_Sensor(Left_Rot);
  Clear_Sensor(Right_Rot);
  Output_On_Forward(Left_Wheel);
  Output_Forward(Right_Wheel);
  while ((Get_Sensor_Value(Left_Rot)+Get_Sensor_Value(Right_Rot))/2<Clicks) loop
    if (Get_Sensor_Value(Left_Rot)>Get_Sensor_Value(Right_Rot)) then
      Output_Float(Left_Wheel);
      Output_On(Right_Wheel);
    else
      Output_Float(Right_Wheel);
      Output_On(Left_Wheel);
    end if;
  end loop;
  Output_Off(Left_Wheel);
  Output_Off(Right_Wheel);
end Go_Backward;
```

1 pt – left turn procedure

```
procedure Turn_Left(Clicks:Integer) is
begin
  Output_Power(Left_Wheel,7);
  Output_Power(Right_Wheel,7);

  Clear_Sensor(Left_Rot);
  Clear_Sensor(Right_Rot);

  Output_On_Forward(Left_Wheel);
  Output_On_Reverse(Right_Wheel);

  while ((Get_Sensor_Value(Left_Rot)+(-1*Get_Sensor_Value(Right_Rot)))<Clicks) loop
    if (Get_Sensor_Value(Left_Rot)>-1*Get_Sensor_Value(Right_Rot)) then
      Output_Float(Left_Wheel);
      Output_On(Right_Wheel);
    else
      Output_Float(Right_Wheel);
      Output_On(Left_Wheel);
    end if;
  end loop;

  Output_Off(Left_Wheel);
  Output_Off(Right_Wheel);

end Turn_Left;

procedure Turn_Left_90 is
begin
  Turn_Left(350); -- YOU MIGHT WANT TO TWEAK THIS NUMBER
end Turn_Left_90;
```

1 pt – right turn procedure

```
  procedure Turn_Right(Clicks:Integer) is
  begin
    Output_Power(Left_Wheel,7);
    Output_Power(Right_Wheel,7);

    Clear_Sensor(Left_Rot);
    Clear_Sensor(Right_Rot);

    Output_On_Reverse(Left_Wheel);
    Output_On_Forward(Right_Wheel);

    while ((-1*Get_Sensor_Value(Left_Rot)+Get_Sensor_Value(Right_Rot))<Clicks) loop
      if (-1*Get_Sensor_Value(Left_Rot)>Get_Sensor_Value(Right_Rot)) then
        Output_Float(Left_Wheel);
        Output_On(Right_Wheel);
      else
        Output_Float(Right_Wheel);
        Output_On(Left_Wheel);
      end if;
    end loop;

    Output_Off(Left_Wheel);
    Output_Off(Right_Wheel);

  end Turn_Right;

  procedure Turn_Right_90 is
  begin
    Turn_Right(350); -- YOU MIGHT WANT TO TWEAK THIS NUMBER
  end Turn_Right_90;

begin
  -- THE WAVY LINE
  Initialize_Robot;
  loop
    Go_Forward(200);
    Turn_Right_90;
    Go_Forward(200);
    Turn_Left_90;
    Go_Forward(200);
    Turn_Right_90;
    Go_Forward(200);
    Turn_Left_90;
    Go_Forward(200);
    Go_Backward(200);
    Turn_Right_90;
    Go_Backward(200);
    Turn_Left_90;
    Go_Backward(200);
    Turn_Right_90;
    Go_Backward(200);
    Turn_Left_90;
    Go_Backward(200);
  end loop;
end;
```