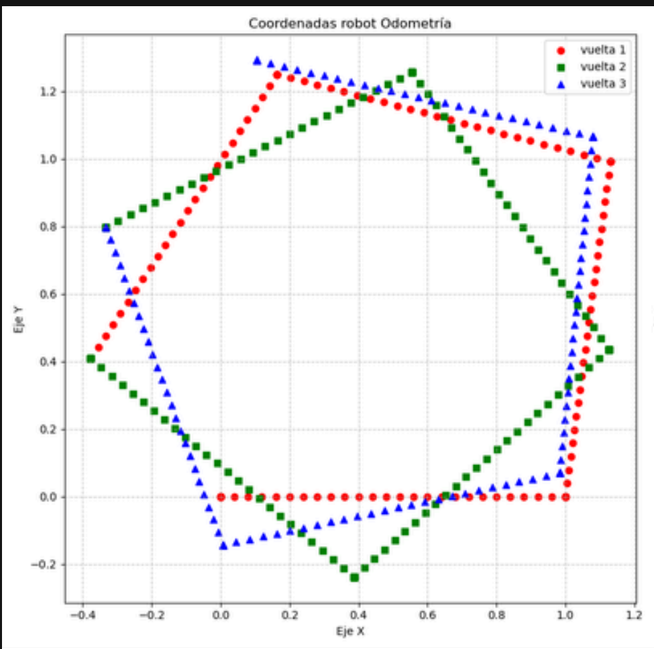
# Laboratorio 2

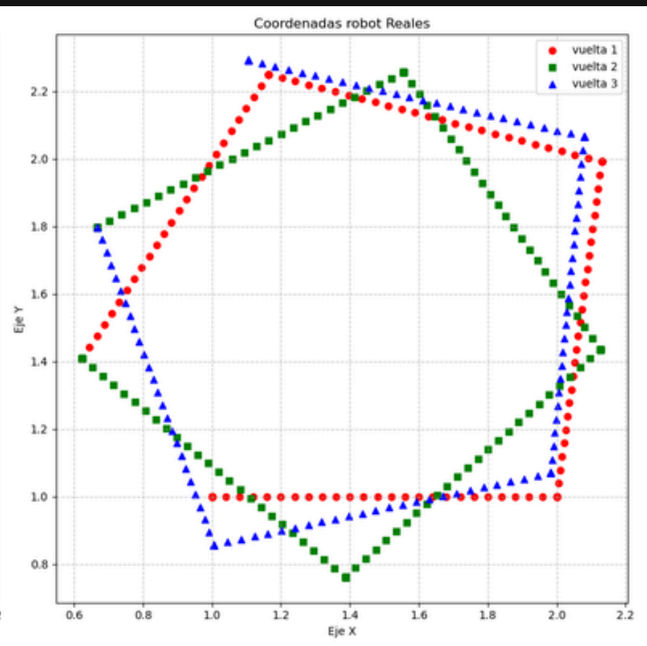
Grupo 8

Integrantes:
Martín Fuentes Flores
Paulo Oses

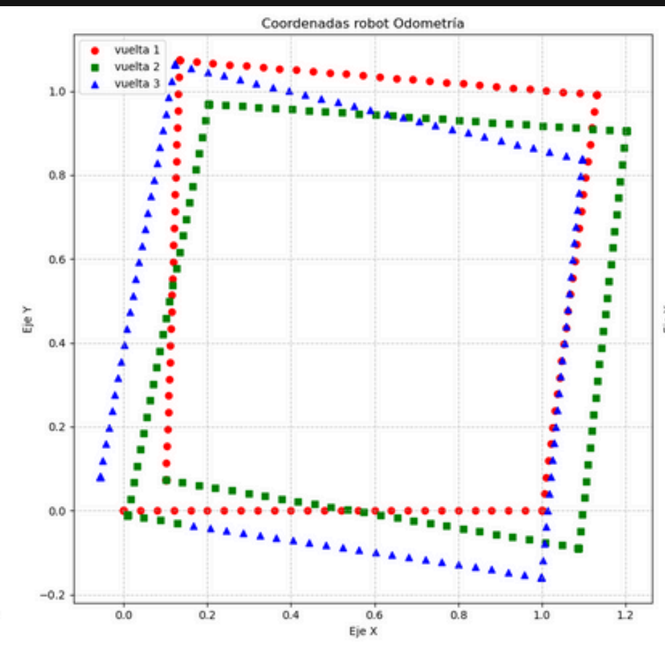
# Parte 1: Programar movimientos

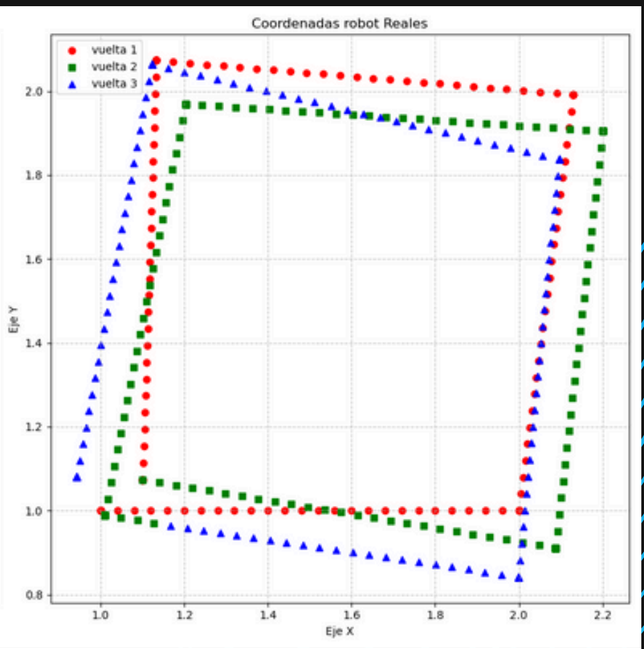
## Gráfico de trayectoria *dead reckoning* sin factor de corrección:




## Gráfico de trayectoria *dead reckoning* con factor de corrección:



# Parte 1: Programar movimientos

**Gráfico de trayectoria control P:**
ctrl. lineal: kp = 0.5
ctrl. angular: kp = 0.3

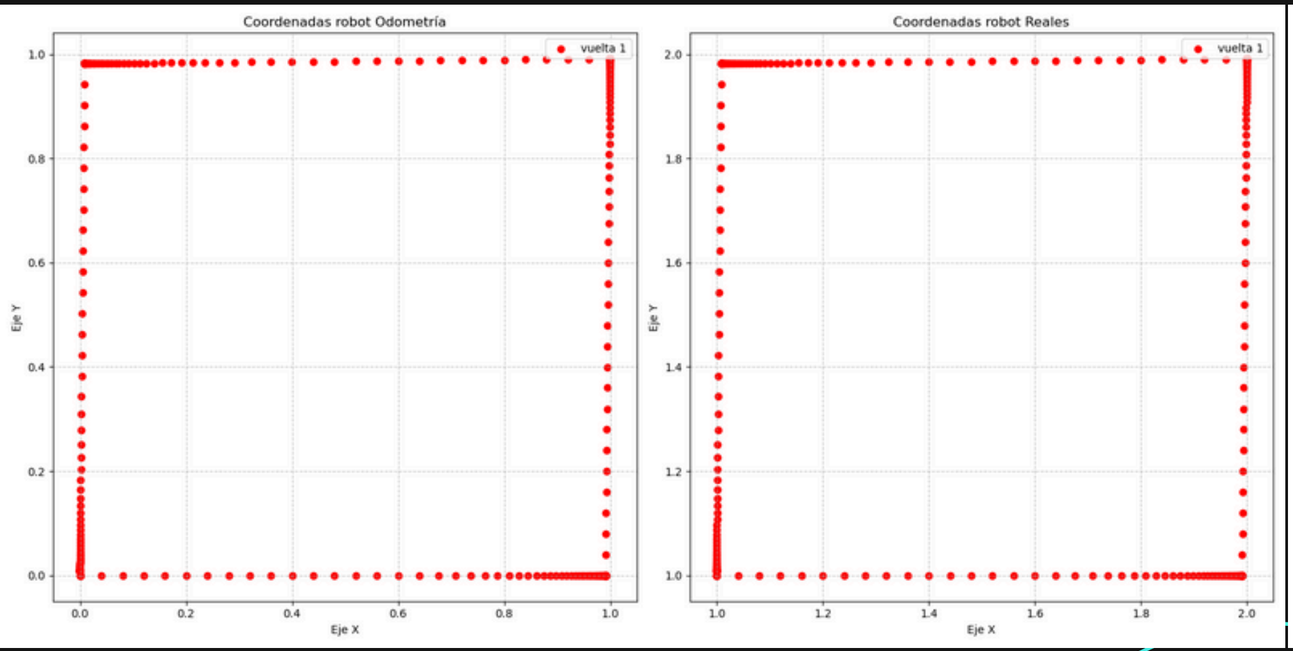
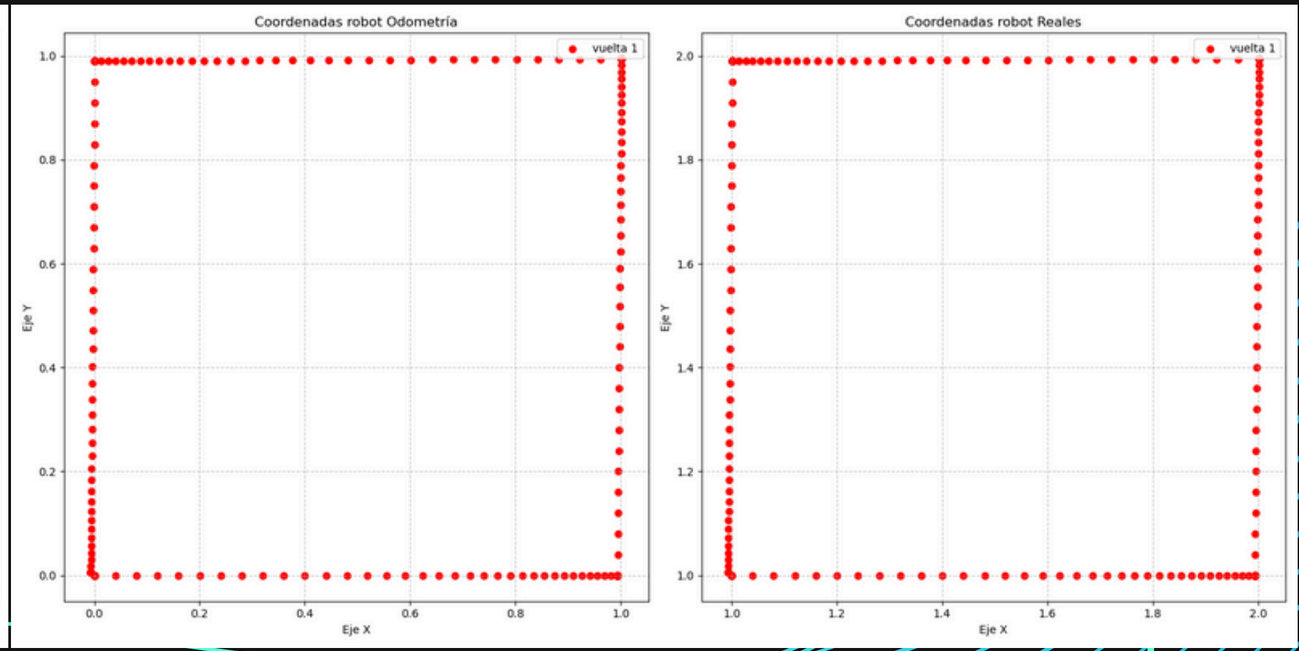


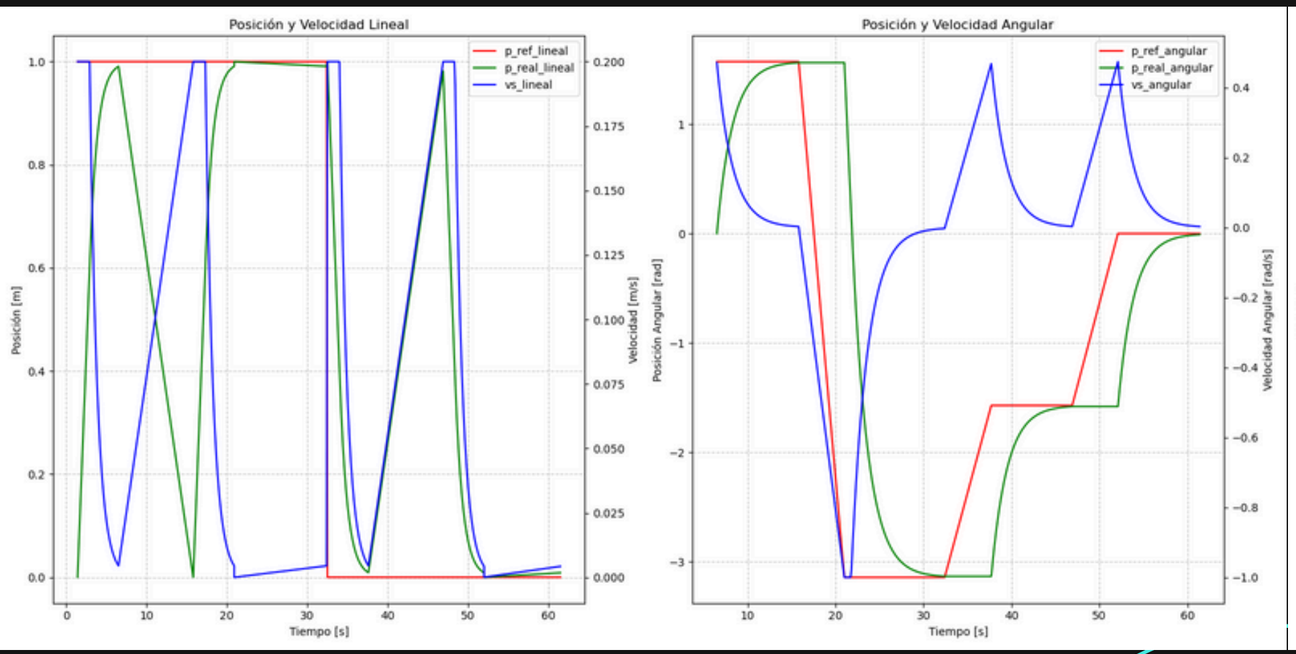

**Gráfico de trayectoria control PI:**
ctrl.lineal: kp= 0.3, ki = 0.02
ctrl.angular: kp = 0.1, ki = 0.007




Tolerancia: error < 0.01
error_lineal < 1cm y error_angular < 0.5 º

# Parte 1: Programar movimientos

**Gráfico de señales control P:**
ctrl. lineal: kp = 0.5
ctrl. angular: kp = 0.3

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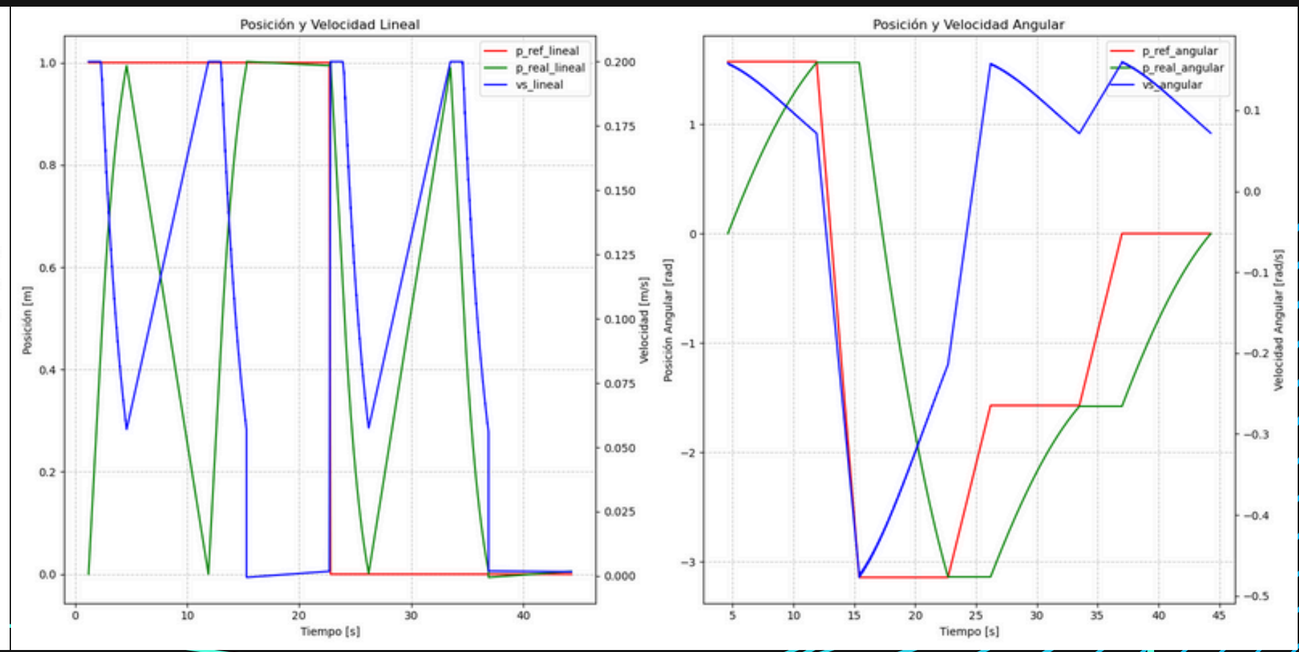
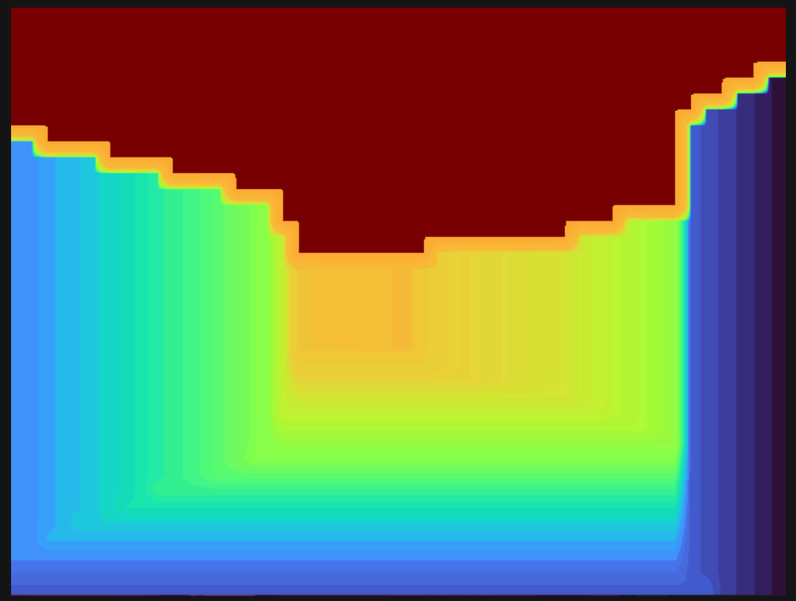


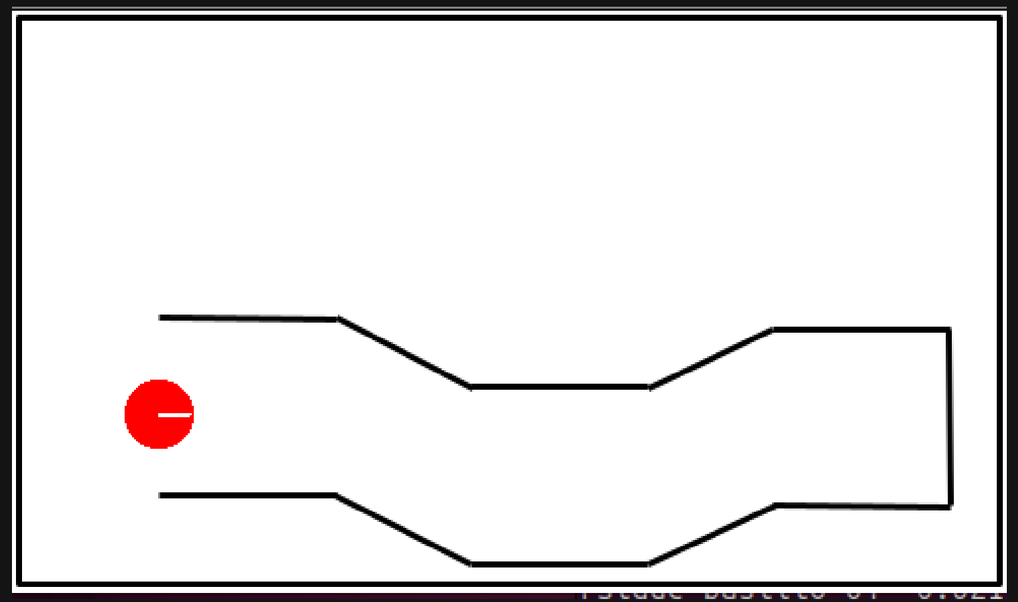
# Parte 1

# Demostración

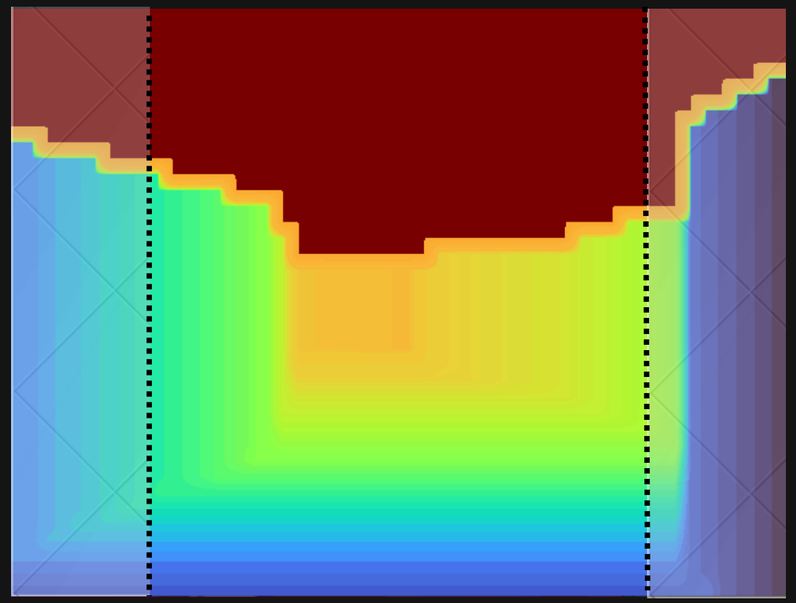
```
ROS2 LAUNCH LAB2 AVANZAR_Y_ROTAR_CTRL.XML
```

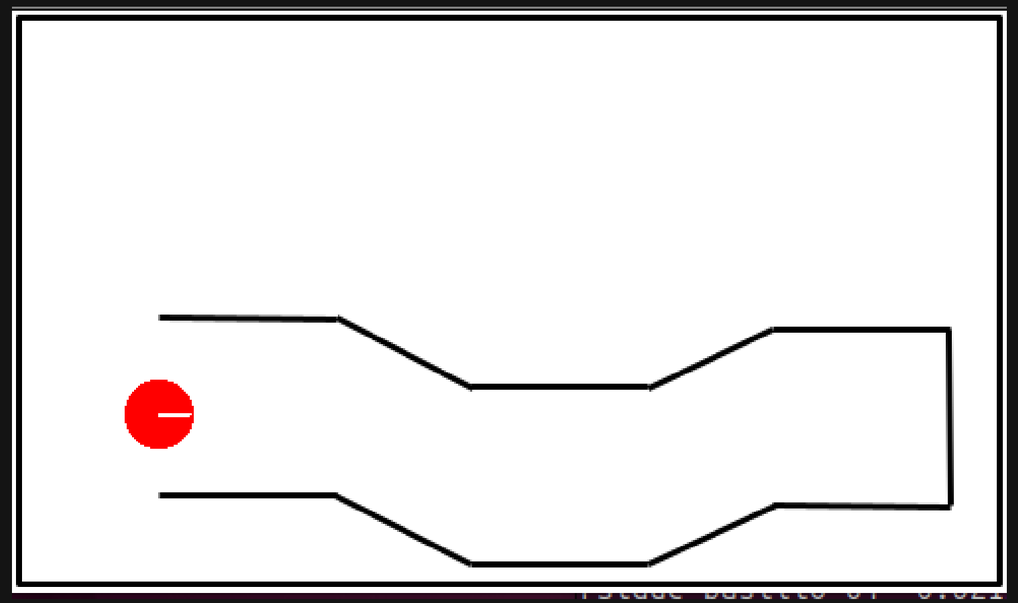
# Parte 2: Criterio de detección de las paredes:





# Parte 2: Criterio de detección de las paredes:





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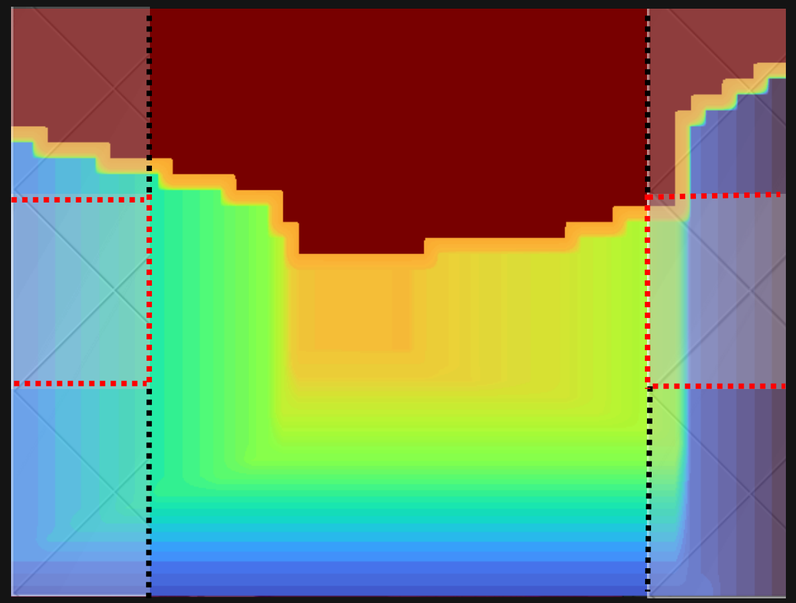
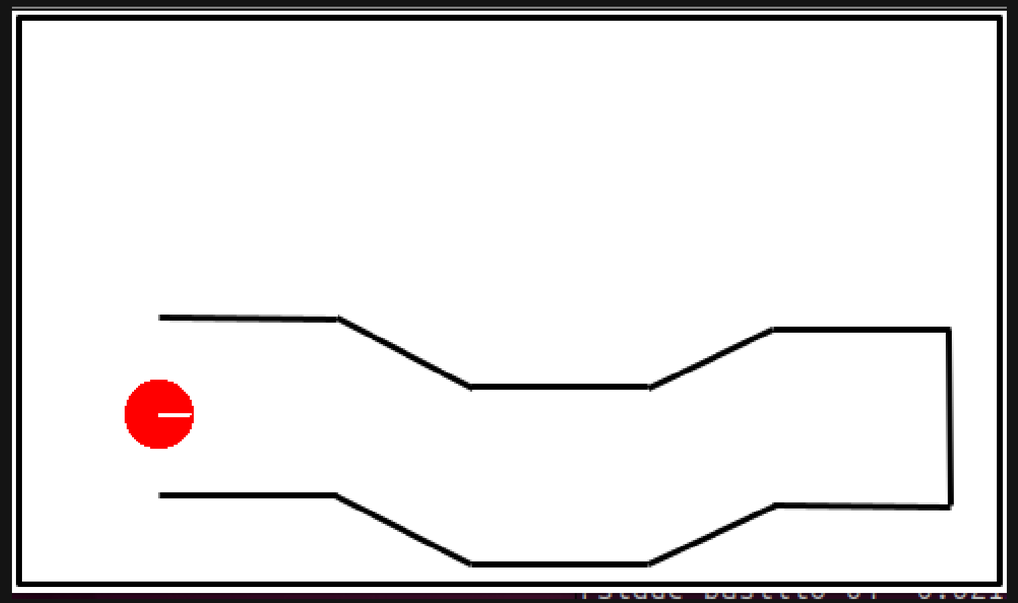
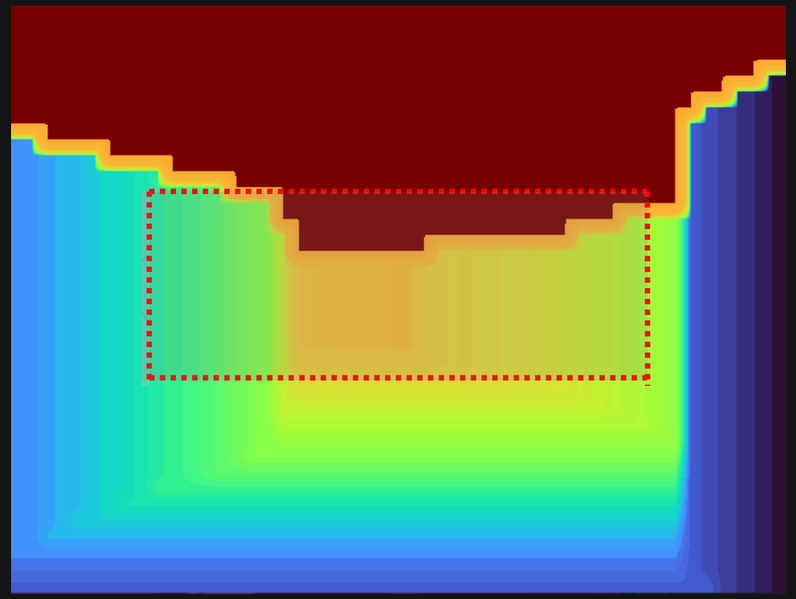




```
>_ ROS2 LAUNCH LAB_2_RM NAVEGACION_PASILLO.XML
```

# Caso extremo: giros bruscos



```python
if dis_centro < 0.5:
    # Si el robot está demasiado cerca de un obstáculo, detenerse
    msg_vel.linear.x = 0.0
```

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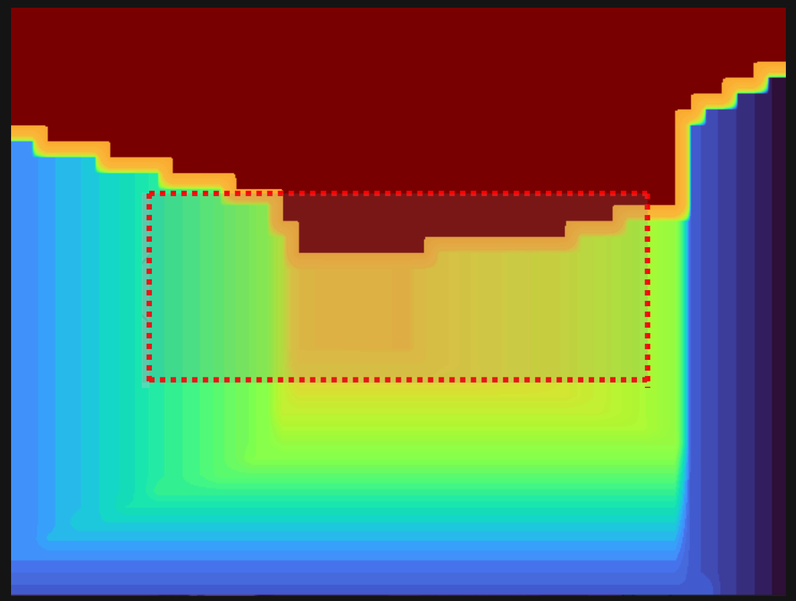

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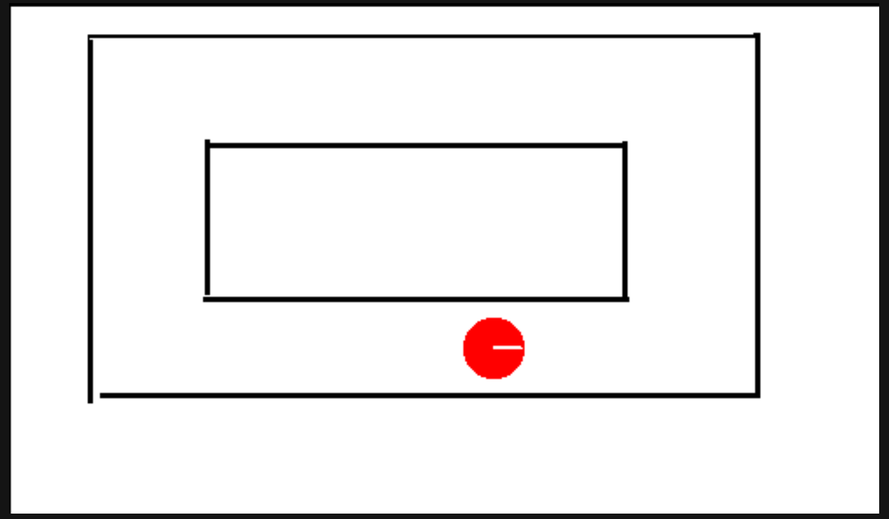
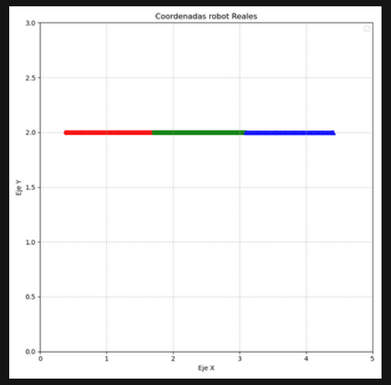


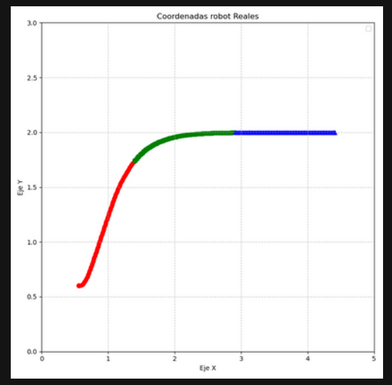
```
ROS2 LAUNCH LAB_2_RM NAVEGACION_CUADRADO_PERFECTO.XML
```

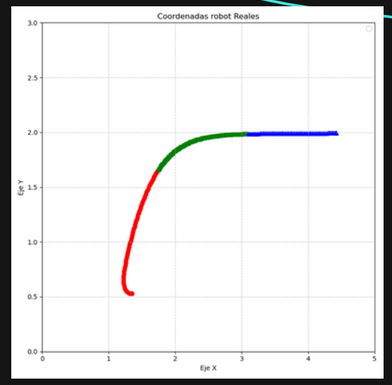
# Parte 3: “Follow the carrot”

# Parte 3: “Follow the carrot”

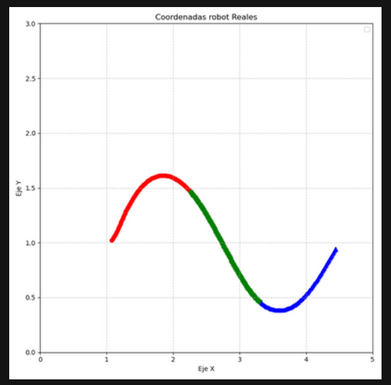
line

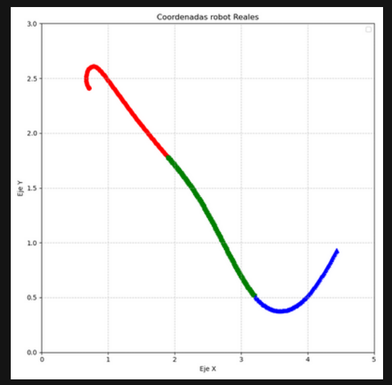


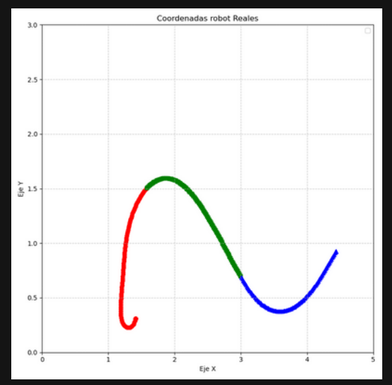



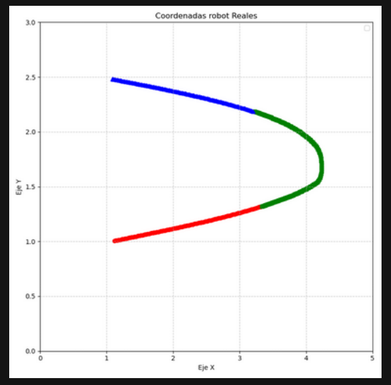

sine

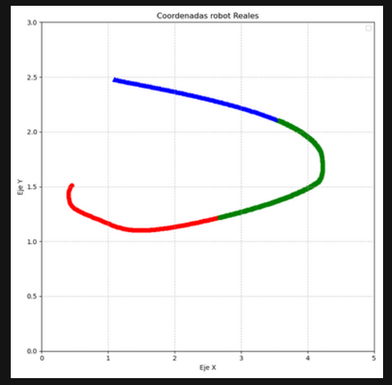


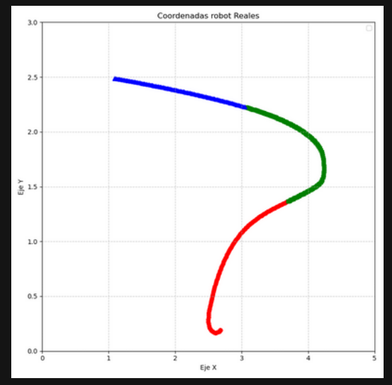




sqrt




Parámetros:

Look ahead distance: 0.2

k_p = 1.5
k_i = 0.01
k_d = 0

# Parte 3

# Demostración

```
ROS2 LAUNCH LAB_2_RM FOLLOW_THE_CARROT_LINE.XML
```

```
ROS2 LAUNCH LAB_2_RM FOLLOW_THE_CARROT_SIN.XML
```

```
ROS2 LAUNCH LAB_2_RM FOLLOW_THE_CARROT_SQRT.XML
```