

Partie 1: Régulation en cap

```
import rospy
```

```
from turtlesim.msg import Pose
```

```
pose = Pose() # Variable globale pour stocker la pose de la tortue
```

```
def pose_callback(data):
```

```
    global pose
```

```
    pose = data
```

```
def main():
```

```
    rospy.init_node('set_way_point_node')
```

```
    # Création du subscriber
```

```
    pose_sub = rospy.Subscriber('/turtle1/pose', Pose, pose_callback)
```

```
    # Définition du waypoint
```

```
    waypoint = Pose()
```

```
    waypoint.x = 7
```

```
    waypoint.y = 7
```

```
    rate = rospy.Rate(10) # Fréquence de boucle (10 Hz)
```

```
    while not rospy.is_shutdown():
```

```
        # Calcul de l'angle désiré
```

```
        desired_angle = math.atan2(waypoint.y - pose.y, waypoint.x - pose.x)
```

```
        # Calcul de la commande en cap
```

```
        error = math.atan2(math.sin(desired_angle - pose.theta), math.cos(desired_angle - pose.theta))
```

```
        u = Kp * error
```

```
# Publication de la commande en cap
```

```
cmd_vel = Twist()
```

```
cmd_vel.angular.z = u
```

```
cmd_vel_pub.publish(cmd_vel)
```

```
rate.sleep()
```

```
if __name__ == '__main__':
```

```
    try:
```

```
        main()
```

```
    except rospy.ROSInterruptException:
```

```
        pass
```