plots_part_1

April 18, 2023

Importing the required libraries

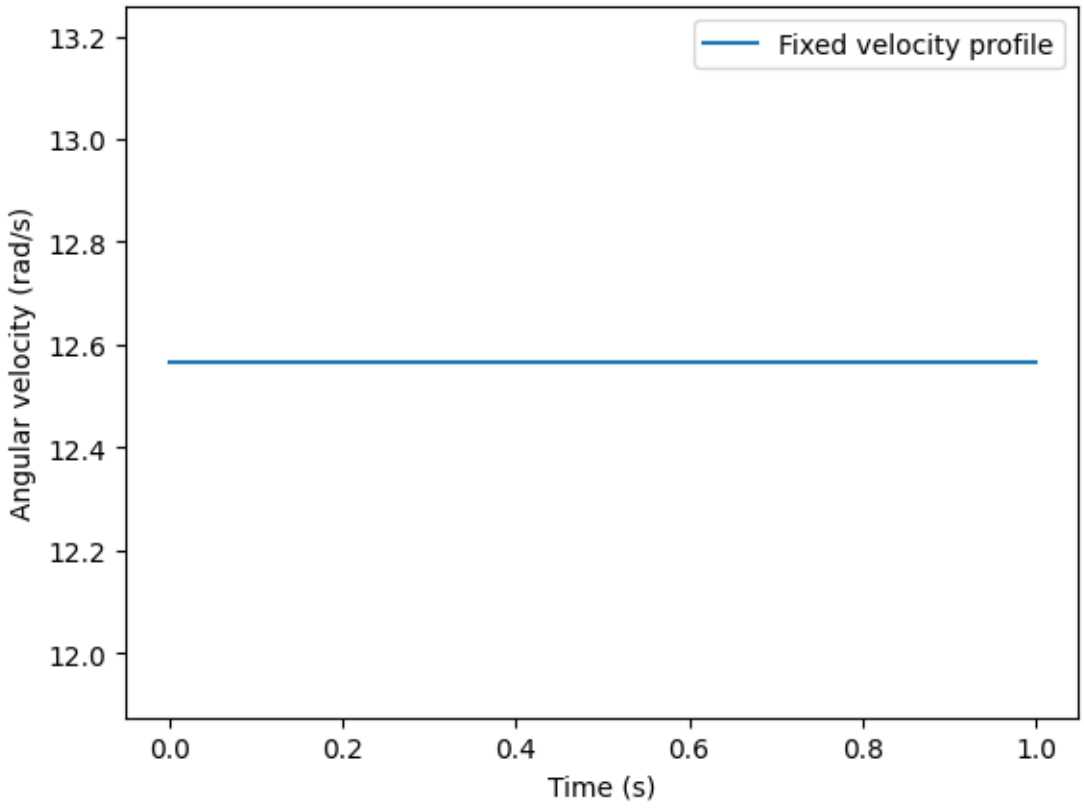
[ ]:
```
import numpy as np
import matplotlib.pyplot as plt
from scipy import integrate
```

Defnining the constants

[ ]:
```
dt = 0.001
_cycles = 2
_time = np.arange(0, 1, dt)
_omega_t = _cycles * 2 * np.pi * np.ones(len(_time))
# _omega_t = _time
_angle_t = _omega_t.cumsum() * dt # Angle in radians
angle = integrate.cumtrapz(_omega_t, _time, initial=0)
```

[ ]:
```
plt.plot(_time, _omega_t, label='Fixed velocity profile')
plt.xlabel('Time (s)')
plt.ylabel('Angular velocity (rad/s)')
plt.legend()
```

[ ]:
```
<matplotlib.legend.Legend at 0x2262ba0e448>
```



[ ]:
```
plt.plot(_time, _angle_t, label='Angle')
plt.xlabel('Time (s)')
plt.ylabel('Angle (rad)')
plt.legend()
```

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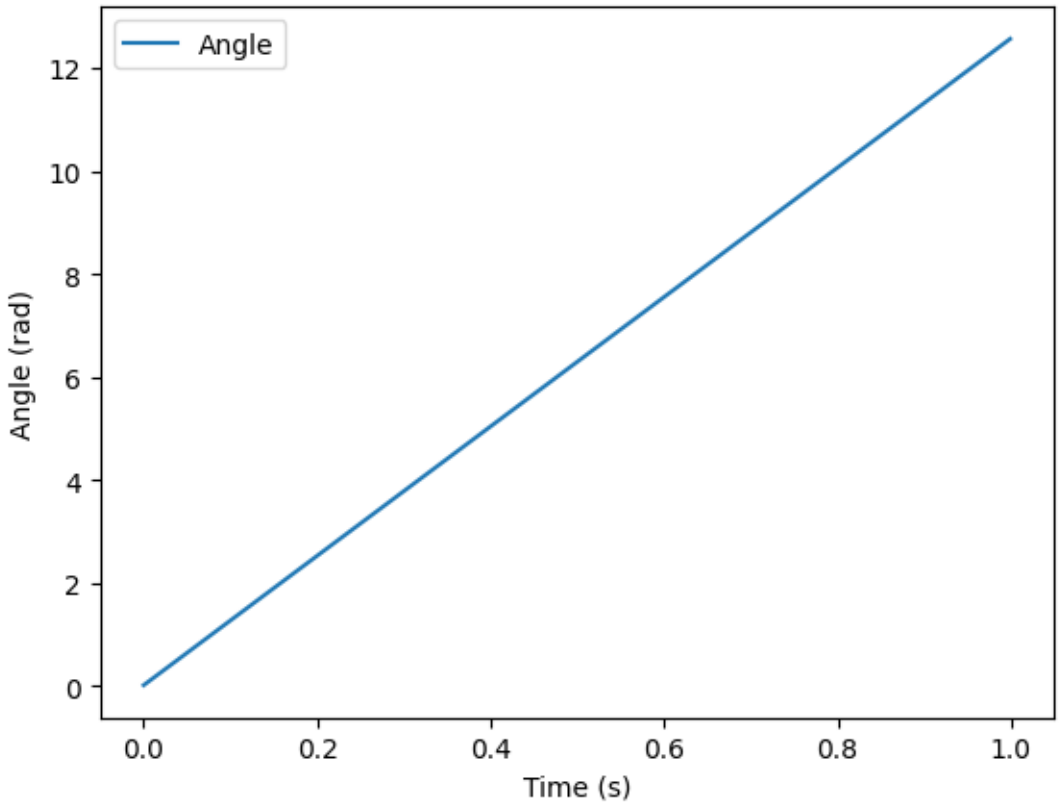
<matplotlib.legend.Legend at 0x2262ba98908>
```



[ ]:
```
# import numpy as np
import math
def find_nearest(array,value):
    idx = np.searchsorted(array, value, side="left")
    if idx > 0 and (idx == len(array) or math.fabs(value - array[idx-1]) < math.
 ↪fabs(value - array[idx])):
        return idx
    else:
        return idx
```

[ ]:
```
"""creating increment values"""

_inc = []
for i in range(_cycles):
    _inc.append(2*np.pi*i)
```

[ ]:
```
edges_pulse_A = []
edges_pulse_B = []
for idx, i in enumerate(_inc):
    edges_pulse_A.append(find_nearest(_angle_t, i))
    edges_pulse_A.append(find_nearest(_angle_t, i + np.deg2rad(5)))
```

```
    edges_pulse_A.append(find_nearest(_angle_t, i + np.deg2rad(2.5)))
    edges_pulse_B.append(find_nearest(_angle_t, i + np.deg2rad(7.5)))
```

[ ]:
```
"""generating the pulse signal"""
pulse_A = np.zeros(len(_angle_t))
pulse_B = np.zeros(len(_angle_t))
for idx, i in enumerate(_inc):
    pulse_A[raising_edge_pulse_A[idx]:falling_edge_pulse_A[idx]] = 1
    # print(idx)
    pulse_B[raising_edge_pulse_B[idx]:falling_edge_pulse_B[idx]] = 1

plt.plot(_time, pulse_A, label='Pulse A')
plt.plot(_time, pulse_B, label='Pulse B')
plt.xlabel('Time (s)')
plt.ylabel('Pulse')
plt.legend()
```

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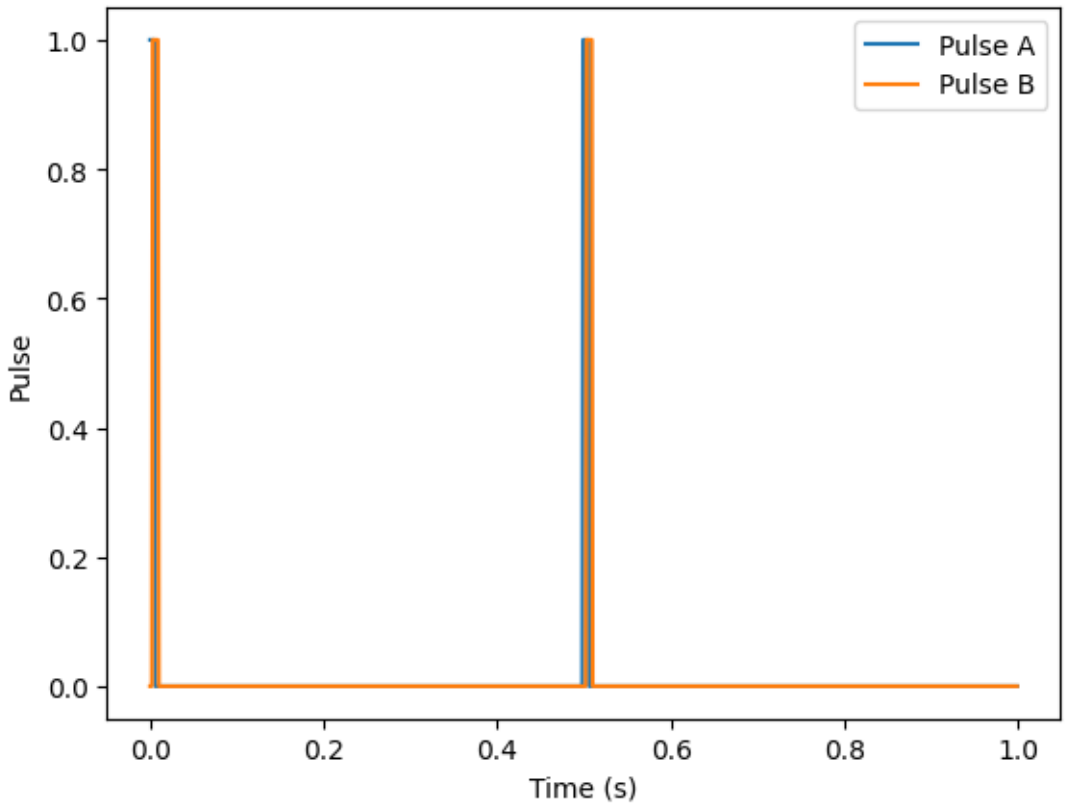
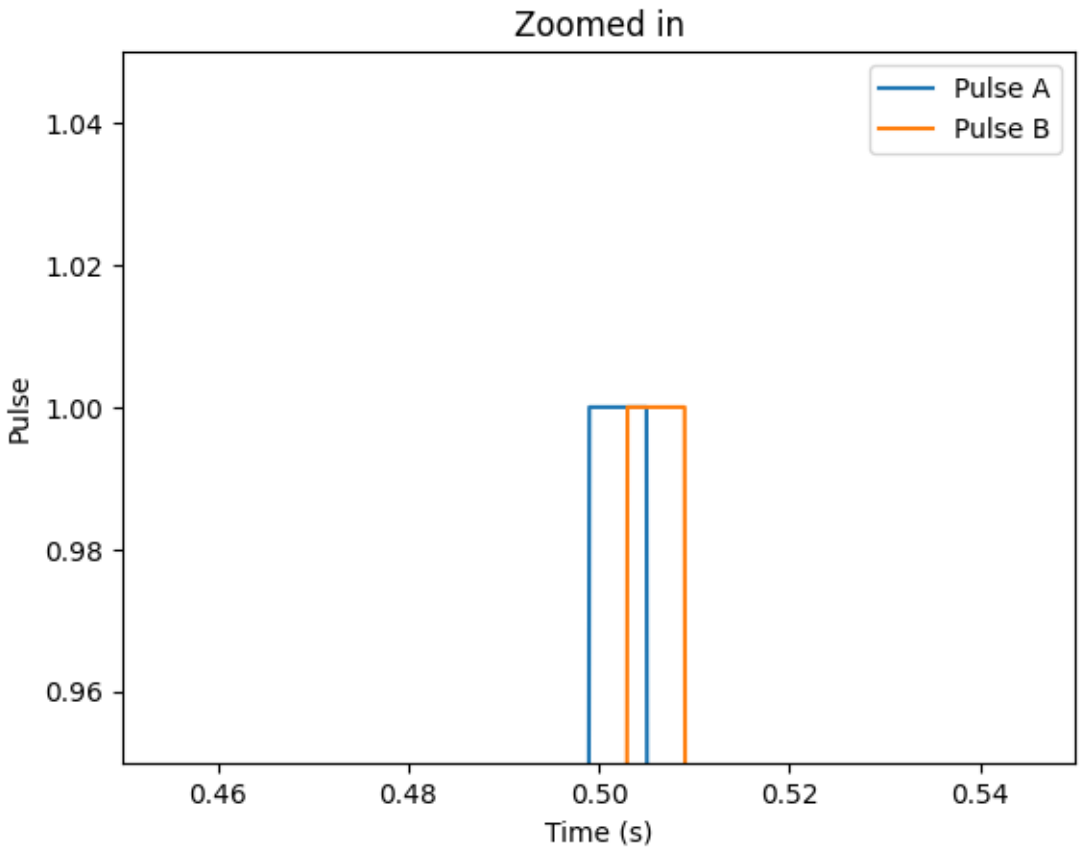
```
<matplotlib.legend.Legend at 0x2262cee5d08>
```



[ ]:
```
plt.plot(_time, pulse_A, label='Pulse A')
plt.plot(_time, pulse_B, label='Pulse B')
plt.axis([0.45, 0.55, 0.95, 1.05])
plt.title('Zoomed in')
plt.xlabel('Time (s)')
plt.ylabel('Pulse')
plt.legend()
```

[ ]:
```
<matplotlib.legend.Legend at 0x2262cb73ec8>
```



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