

Assignment 2

11 September 2023 14:24

```
[ ] import numpy as np
delays = [3.74277e-11, 4.949883e-11, 6.120916e-11, 7.282830e-11, 8.441556e-11, 9.600515e-11, 1.076056e-10, 1.192169e-10]
# slope - tau, intercept = ro_inv
fanout = [1, 2, 3, 4, 5, 6, 7, 8]
print(np.polyfit(np.array(fanout), np.array(delays), 1)) # Slope and intercept
[1.16551605e-11 2.60776779e-11]
```

⇒ Calculating the slope and Intercept of the curve for delay vs fanout observed on the dut.

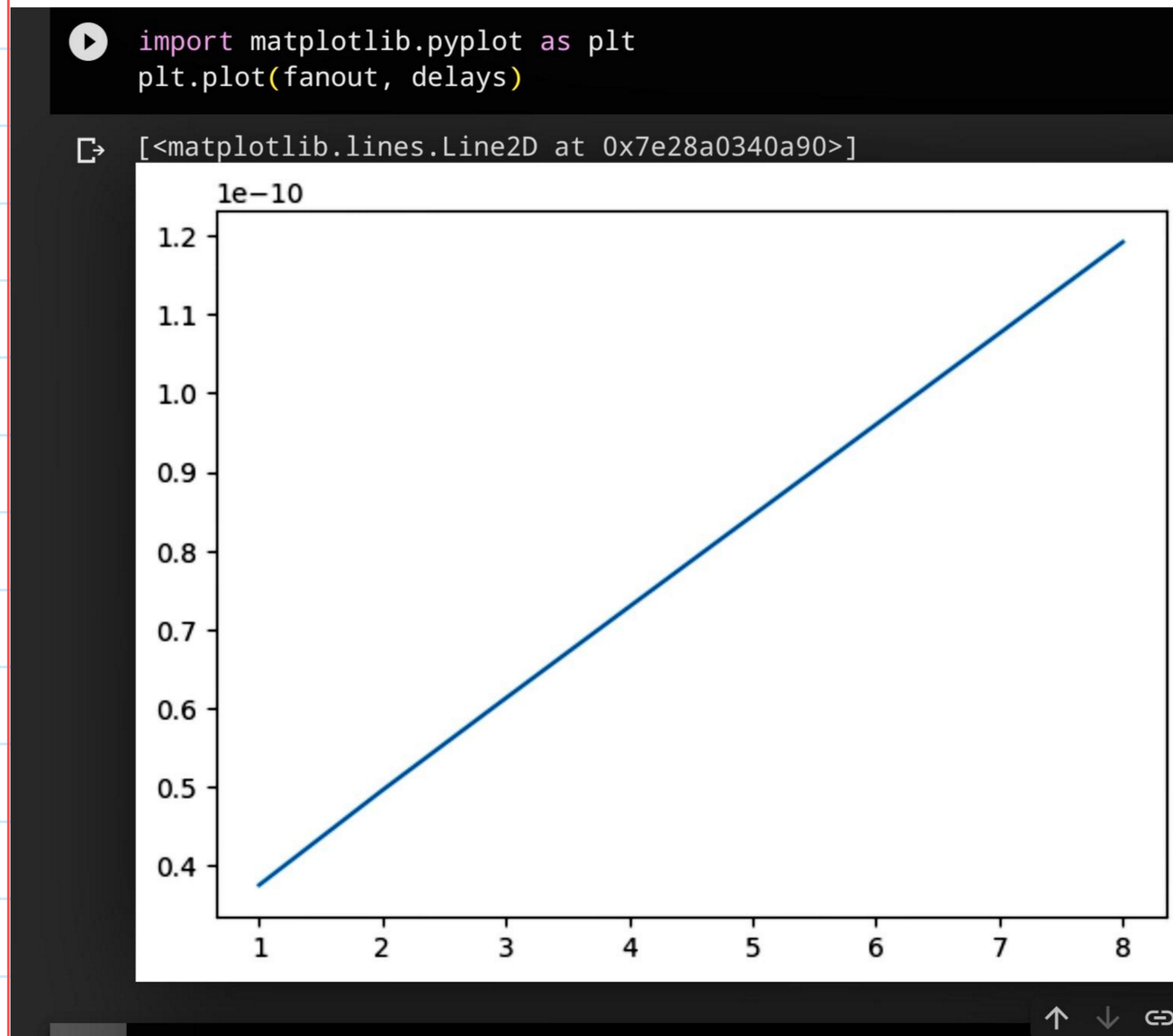
⇒ As we can see that

$$\text{Slope} = 1.16551605 \times 10^{-11} \Rightarrow \boxed{Z = 11.655 \text{ pSec/inverter}}$$

$$\text{Intercept} = 2.60776779 \times 10^{-11}$$

from this we can see that $y \text{ intercept} = 26.0776 \times 10^{-12} = P_{inv} \cdot Z$

$$\Rightarrow \boxed{P_{inv} = \frac{26.0776779}{11.6551605} = 2.23743}$$



The width of the p channels was = 1.053 μm
The width of the n channels was = 0.3161 μm

$$\text{Hence } \text{Gamma}(s) = \frac{1.053}{0.3161} = 3.3312 \approx 3.33$$