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In [1]: import pandas as pd
import numpy as np
```

```
In [3]: s=pd.read_excel("C:\\Users\\alanv\\OneDrive\\Desktop\\Raw Data_gyroscope.xlsx")
d=pd.DataFrame(s)
print(d.head())
```

	Time (s)	Gyroscope x (rad/s)	Gyroscope y (rad/s)	Gyroscope z (rad/s)	\
0	0.048774	0.335682	-0.408384	-1.172023	
1	0.051250	0.286681	-0.368970	-1.160305	
2	0.053726	0.249531	-0.350861	-1.159240	
3	0.056203	0.216509	-0.347665	-1.162436	
4	0.058673	0.180291	-0.341274	-1.157109	

	Absolute (rad/s)
0	1.285728
1	1.250853
2	1.236611
3	1.232479
4	1.219785

```
In [24]: z=d.iloc[:,3].values
print(z)
```

```
[-1.17202258 -1.16030502 -1.15923989 ... -0.48081955 -0.48401526
 -0.48721096]
```

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In [25]: time_diff=0.00247
```

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In [17]: #time = np.arange(len(z)) * time_diff
```

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In [26]: acceleration = np.gradient(z,time_diff)
```

```
In [27]: print(acceleration)
```

```
[ 4.74395061  2.58758968 -0.43127713 ... -3.01887874 -1.2938069
 -1.29380688]
```

```
In [21]: print(acceleration[:20],"\n")
print(z[:20])
```

```
[ 4.74395061  2.58758968 -0.43127713  0.43127692  0.86252996 -0.86252976
 -1.07816842 -0.43127713  0.64691559  0.21563846  0.          1.50944555
 2.15633684  2.80322814  2.3719751   1.72508381  2.80325243  3.23450526
 2.3719753   2.15636093]
```

```
[-1.17202258 -1.16030502 -1.15923989 -1.16243553 -1.15710938 -1.15817463
 -1.16137028 -1.16350079 -1.16350079 -1.16030502 -1.16243553 -1.16030502
 -1.15497887 -1.14965272 -1.14113092 -1.13793516 -1.13260901 -1.12408709
 -1.11663055 -1.11236954]
```