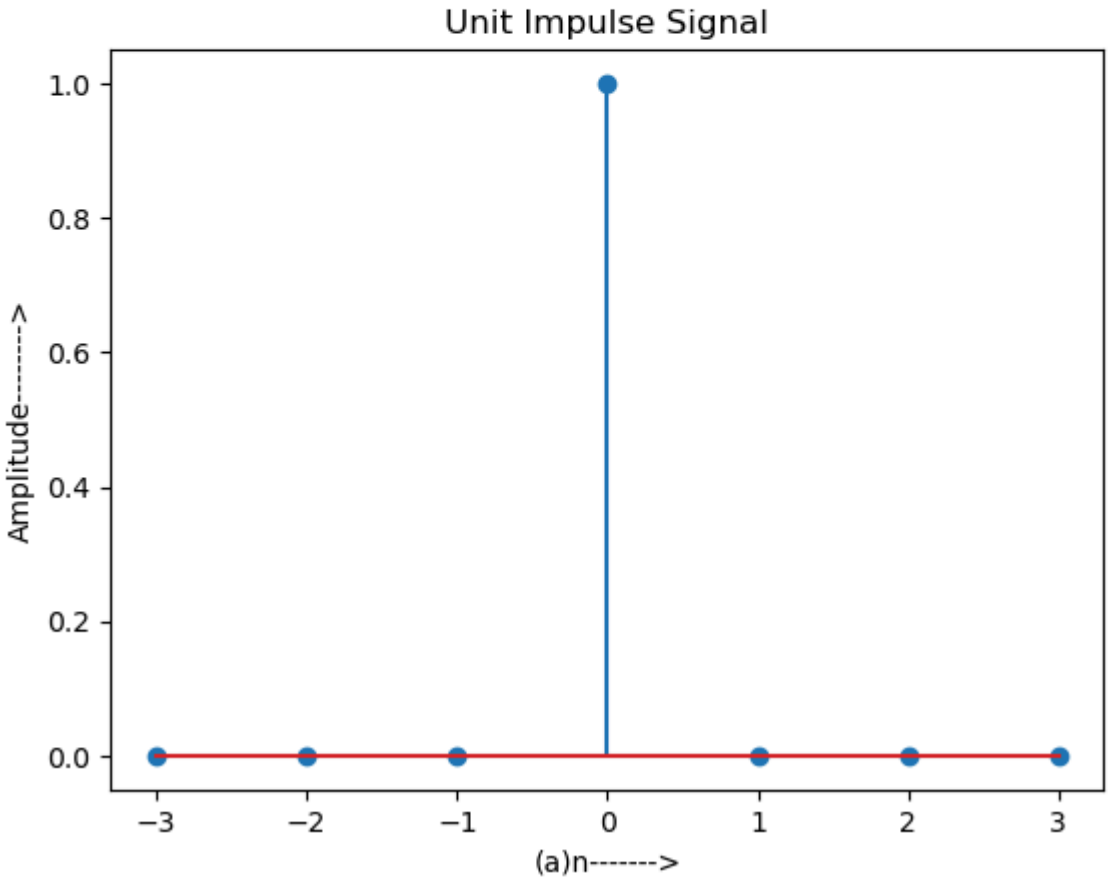
1. Unit Impulse Signal

Unit impulse signal: It's defined as a pulse compressed along the horizontal axis and stretched along the vertical axis, keeping the area unity. Diagram. It is defined as, It exists only at t= 0 and the area under impulse function is unity.

```
import numpy as np
import matplotlib.pyplot as plt
```

```
t = np.arange(-3, 4, 1)
y = np.concatenate((np.zeros(3), [1], np.zeros(3)))
```

```
plt.stem(t, y)
plt.xlabel('(a)n------->')
plt.ylabel('Amplitude-------->')
plt.title('Unit Impulse Signal')
plt.show()
```



2. Unit Step Sequence [u(n)-u(n-N)]

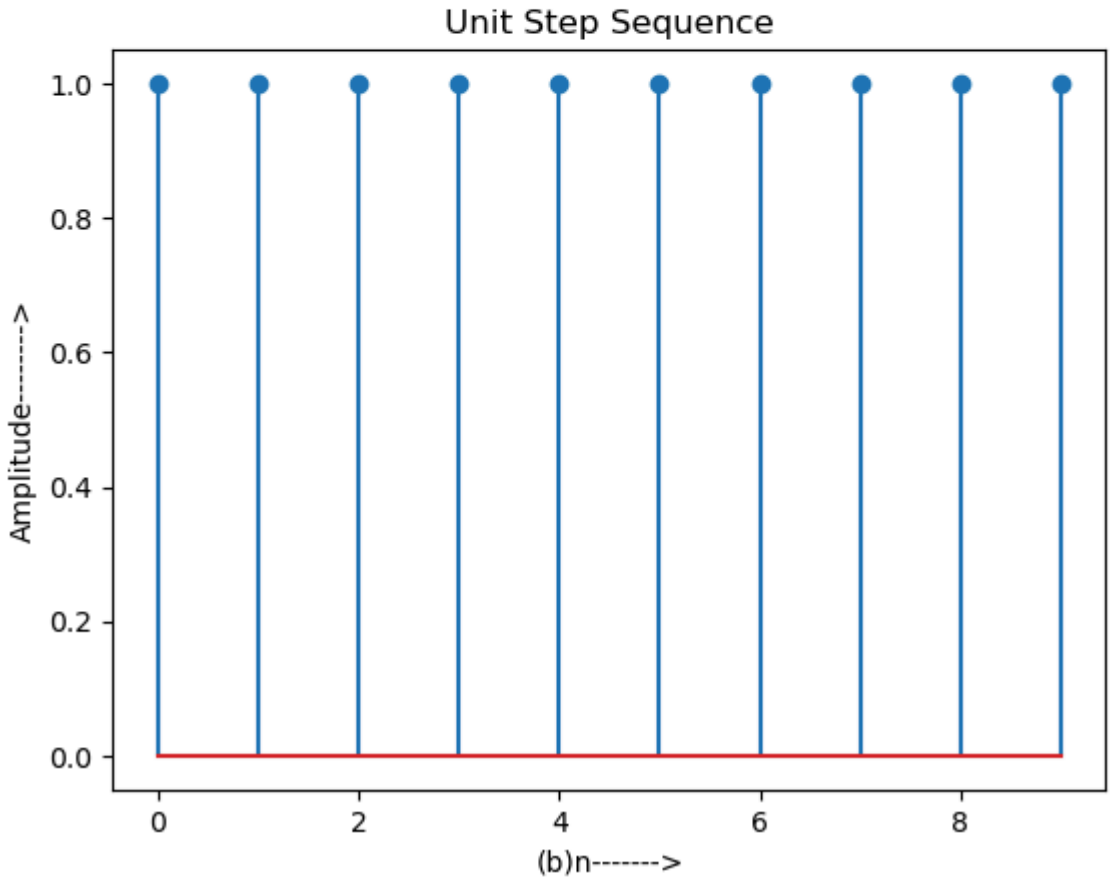
Unit Step Sequence: A unit step sequence is a discrete-time signal that represents a step function. In discrete-time signal processing, a sequence is a set of values indexed by integers.

```
import numpy as np
import matplotlib.pyplot as plt
```

```
n = int(input("Enter the value of N : "))
t = np.arange(0, n, 1)
y = np.ones(n)
```

```
Enter the value of N : 10
```

```
plt.stem(t, y)
plt.xlabel('(b)n------->')
plt.ylabel('Amplitude-------->')
plt.title('Unit Step Sequence')
plt.show()
```



3. Ramp sequence

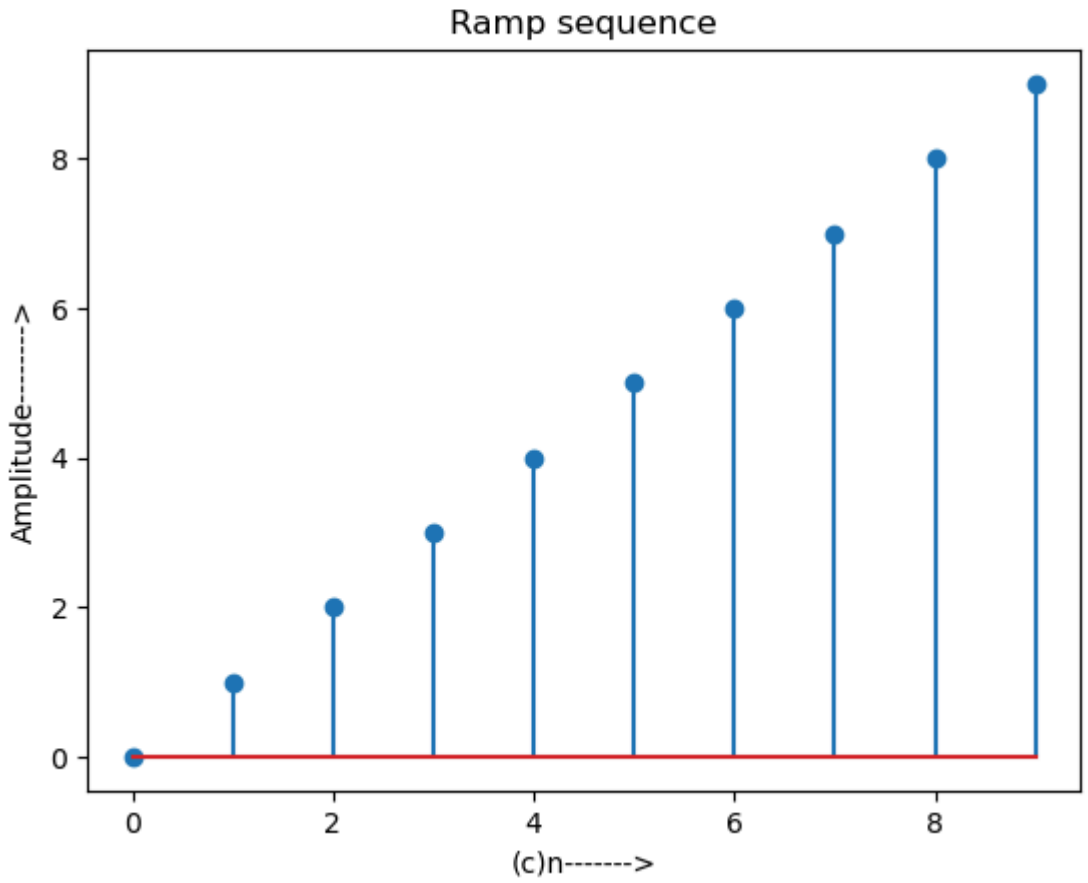
Ramp sequences occur when the average translational efficiency of codons near the 5' end of highly expressed genes is significantly lower than the rest of the gene sequence, which counterintuitively increases translational efficiency by decreasing downstream ribosomal collisions

```
import numpy as np
import matplotlib.pyplot as plt
```

```
n = int(input("Enter the value of N : "))
t = np.arange(0, n, 1)
```

```
Enter the value of N : 10
```

```
plt.stem(t, t)
plt.xlabel('(c)n------->')
plt.ylabel('Amplitude-------->')
plt.title('Ramp sequence')
plt.show()
```



4. Exponential sequence

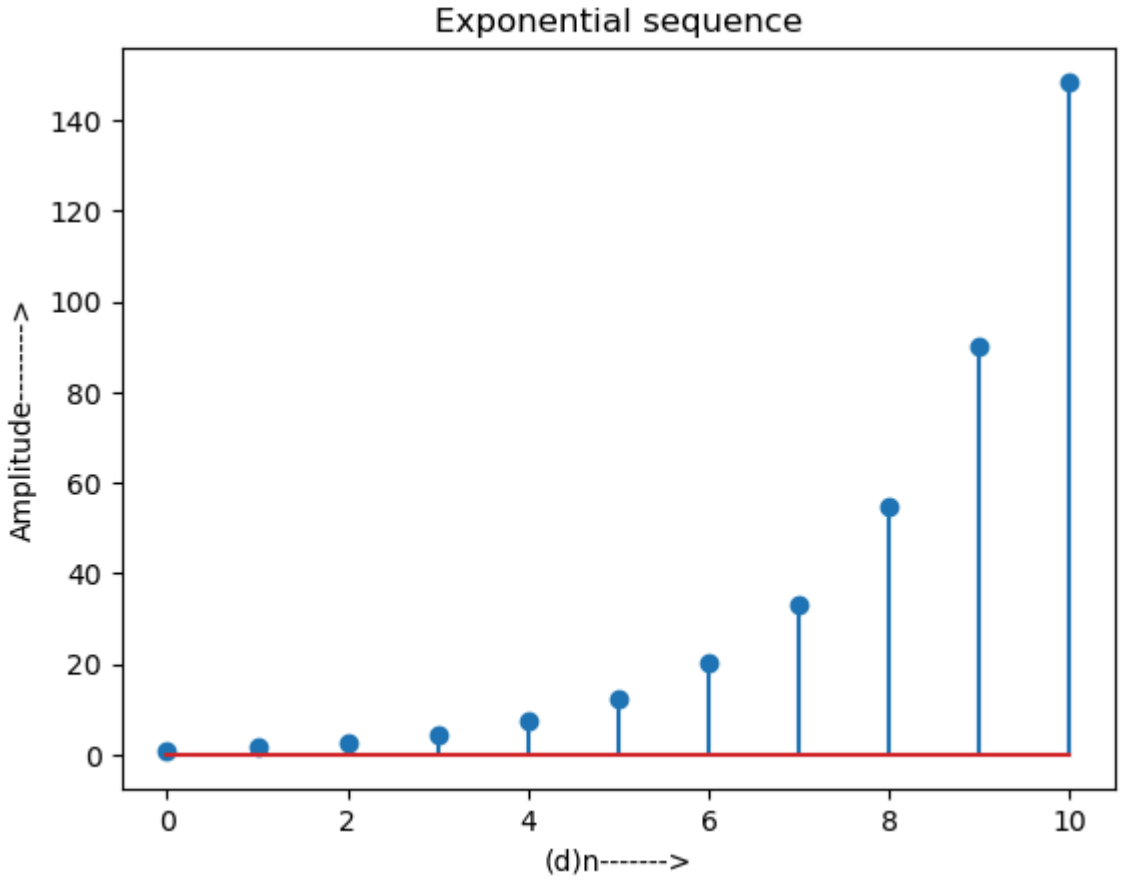
A sequence of numbers has an *exponential pattern* when each successive number increases (or decreases) by the same percent.

```
import numpy as np
import matplotlib.pyplot as plt
```

```
n = int(input("Enter the length of Exponential sequence : "))
t = np.arange(0, n + 1, 1)
a = float(input("Enter the value of a : "))
y = np.exp(a*t)
```

```
Enter the length of Exponential sequence : 10
Enter the value of a : 0.5
```

```
plt.stem(t, y)
plt.xlabel('(d)n------->')
plt.ylabel('Amplitude-------->')
plt.title('Exponential sequence')
plt.show()
```

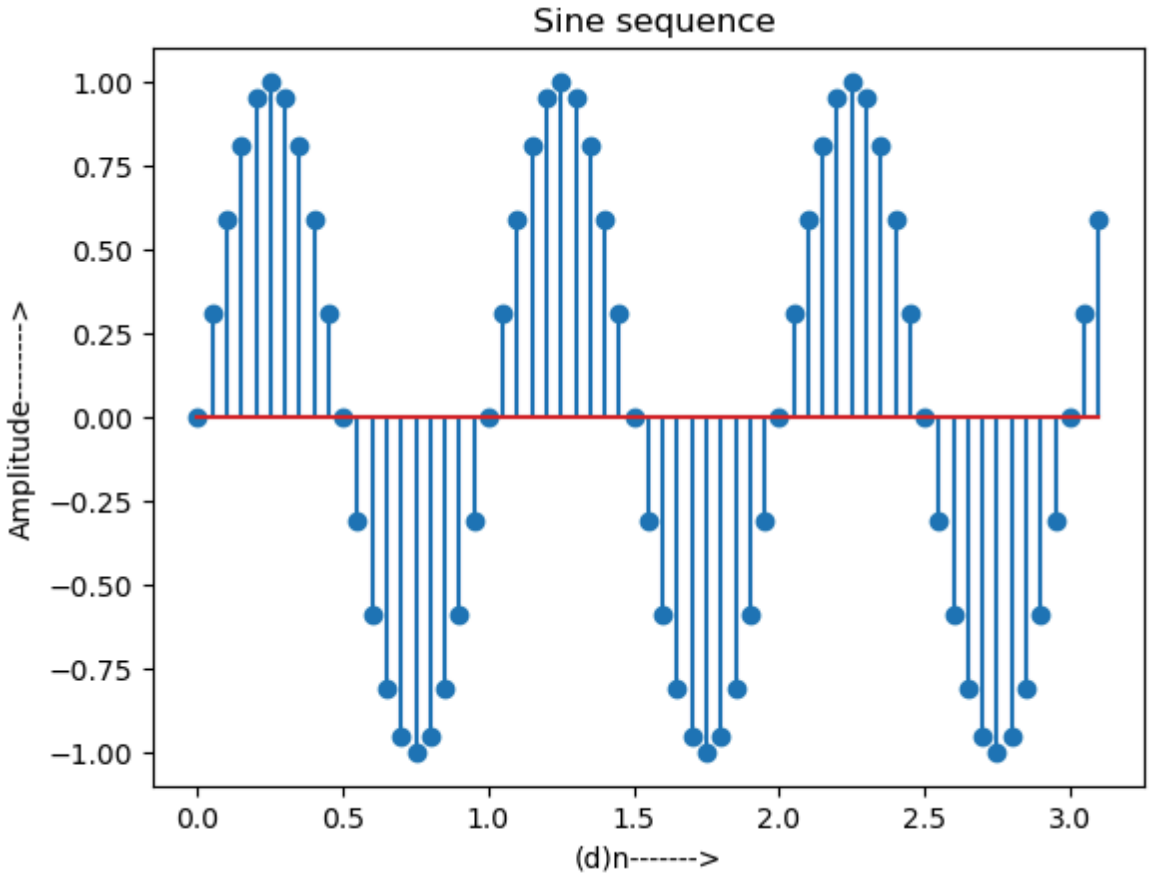


5. Sine sequence

```
import numpy as np
import matplotlib.pyplot as plt
```

```
t = np.arange(0, np.pi, 0.05)
y = np.sin(2 * np.pi * t)
```

```
plt.stem(t, y)
plt.xlabel('(d)n------->')
plt.ylabel('Amplitude-------->')
plt.title(' Sine sequence')
plt.show()
```



6. Cosine sequence

```
import numpy as np
import matplotlib.pyplot as plt
```

```
t = np.arange(0, np.pi, 0.05)
y = np.cos(2 * np.pi * t)
```

```
plt.stem(t, y)
plt.xlabel('(f)n------->')
plt.ylabel('Amplitude-------->')
plt.title('Cosine sequence')
plt.show()
```