

Checking Convexity

In [2]:

```
1 import numpy as np
2
```

In [3]:

```
1 t=np.arange(0,1,0.01)
2 t
```

Out[3]:

```
array([0. , 0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.1 ,
       0.11, 0.12, 0.13, 0.14, 0.15, 0.16, 0.17, 0.18, 0.19, 0.2 , 0.21,
       0.22, 0.23, 0.24, 0.25, 0.26, 0.27, 0.28, 0.29, 0.3 , 0.31, 0.32,
       0.33, 0.34, 0.35, 0.36, 0.37, 0.38, 0.39, 0.4 , 0.41, 0.42, 0.43,
       0.44, 0.45, 0.46, 0.47, 0.48, 0.49, 0.5 , 0.51, 0.52, 0.53, 0.54,
       0.55, 0.56, 0.57, 0.58, 0.59, 0.6 , 0.61, 0.62, 0.63, 0.64, 0.65,
       0.66, 0.67, 0.68, 0.69, 0.7 , 0.71, 0.72, 0.73, 0.74, 0.75, 0.76,
       0.77, 0.78, 0.79, 0.8 , 0.81, 0.82, 0.83, 0.84, 0.85, 0.86, 0.87,
       0.88, 0.89, 0.9 , 0.91, 0.92, 0.93, 0.94, 0.95, 0.96, 0.97, 0.98,
       0.99])
```

In [4]:

```
1 def f(x):
2     return x*x
3 a=-1
4 b=1
5 for i in t:
6     r1=f(i*a+(1-i)*b)
7     r2=f(i*f(a)+(1-i)*f(b))
8     if(r1<=r2):
9         print("It is Convex Function")
10        break
11 if(r1>r2):
12     print("It is non-convex Function")
```

It is Convex Function

In [5]:

```
1 def f1(x):
2     return (x+1)**2
3 a=0
4 b=1
5 for i in t:
6     r1=f1(i*a+(1-i)*b)
7     r2=f1(i*f(a)+(1-i)*f1(b))
8     if(r1<=r2):
9         print("It is Convex Function")
10        break
11 if(r1>r2):
12     print("It is non-convex Function")
```

It is Convex Function

Result

In []:

1