In [ ]:
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# Tejas Acharya
# EE-541
# Homework 01
# Problem 03
```

In [ ]:
```
#Importing Libraries
import sys
from func import f
```

In [ ]:
```
#Constants
CONVERGENCE_CRITERION = 10e-10
```

In [ ]:
```
def secant_method(a, b):
    N = 0
    xn = None
    xn_1 = b
    xn_2 = a
    while True:
        numerator = xn_1 - xn_2
        denominator = f(xn_1) - f(xn_2)
        xn = xn_1 - (numerator / denominator) * f(xn_1)
        N += 1
        if abs(xn - xn_1) < CONVERGENCE_CRITERION :
            break
        xn_2 = xn_1
        xn_1 = xn

    return (N, xn_2, xn_1, xn)
```

In [ ]:
```
def main():
    if (len(sys.argv) != 3):
        print('[Usage]:python3 secant_method.py a b')
        sys.exit(1)

    try:
        a = float(sys.argv[1])
        b = float(sys.argv[2])
    except:
        sys.stderr.write('Command line arguments are not of numeric type')
        sys.exit(1)

    if a >= b:
        sys.stderr.write('a must be less than b')
        sys.exit(1)
    elif (f(a) * f(b)) >= 0:
        sys.stderr.write('f(a) * f(b) must be less than 0')
        sys.exit(1)

    N, xn_2, xn_1, xn = secant_method(a, b)
    print(N)
    print(xn_2)
    print(xn_1)
    print(xn)

    return
```

In [ ]:
```
main()
```