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Practical 9

Leaky Bucket

- **Implement Leaky Bucket mechanism..**

leaky_bucket.py

```
import random
import numpy as np

def possion_distribution(x):
    ex=np.exp(-x)
    num=0
    p=1
    while(1):
        p=p*random.random()
        num+=1
        if(p<ex):
            break
    return(num)

avg_arrival_rate=int(input("Enter the Avrage arrival rate
: "))
bucket_capacity=int(input("Enter Bucket Capacity : "))
avg_transmission_rate=int(input("Enter the Avrage
Transmission rate : "))
maximum_data=int(input("Enter the maximum data : "))
x=0
y=maximum_data
filed_bucket=0
i=1

while(maximum_data>=0):
```

```
    new_packet=possion_distribution(avg_arrival_rate)
    filed_bucket=filed_bucket+new_packet
    if(maximum_data>avg_transmission_rate):
        print(f"\n\n*** After {i} Sec ****\n")
        i+=1
        print(f"new tokens Genrated(arrival) :
{new_packet}")
        if(filed_bucket<=bucket_capacity):
            if(filed_bucket-avg_transmission_rate>=0):
                filed_bucket-=avg_transmission_rate
                x=x+avg_transmission_rate
            else:
                x+=filed_bucket
                filed_bucket=0
            print(f"Packet in Buffer storage :
{filed_bucket}")
        else:
            x=x+(filed_bucket-bucket_capacity)
+avg_transmission_rate
            print(f"Lost token :",(filed_bucket-
bucket_capacity))
            filed_bucket=bucket_capacity
            filed_bucket-=avg_transmission_rate
            print(f"Buffer storage : {filed_bucket}")
    maximum_data=maximum_data-new_packet

print(f"\n\n*** After {i} Sec ****\n")
if(filed_bucket>bucket_capacity):
    print(f"Lost token :",(filed_bucket-bucket_capacity))
    filed_bucket=bucket_capacity
print(f"new tokens Genrated(arrival) : {new_packet}")
print(f"Packet in Buffer storage : {(filed_bucket+x)-y}")
```

EXECUTION

Input :

avg_arrival_rate=100

bucket_capacity=150

avg_transmission_rate=90

maximum_data=1000

Output :

*** After 1 Sec ****

new tokens Genrated(arrival) : 54
Packet in Buffer storage : 9

*** After 2 Sec ****

new tokens Genrated(arrival) : 41
Packet in Buffer storage : 5

*** After 3 Sec ****

new tokens Genrated(arrival) : 60
Packet in Buffer storage : 20

*** After 4 Sec ****

new tokens Genrated(arrival) : 45
Packet in Buffer storage : 20

*** After 5 Sec ****

new tokens Genrated(arrival) : 49
Packet in Buffer storage : 24

*** After 6 Sec ****

new tokens Genrated(arrival) : 58
Lost token : 7
Buffer storage : 30

*** After 7 Sec ****

new tokens Genrated(arrival) : 42
Packet in Buffer storage : 27

*** After 8 Sec ****

new tokens Genrated(arrival) : 61
Lost token : 13
Buffer storage : 30

*** After 9 Sec ****

new tokens Genrated(arrival) : 43
Packet in Buffer storage : 28

*** After 10 Sec ****

new tokens Genrated(arrival) : 46
Packet in Buffer storage : 29

*** After 11 Sec ****

new tokens Genrated(arrival) : 46

Packet in Buffer storage : 45

leaky_bucket.py

Python Language | Run | Stop | Run Settings... | Back/Forward | View

leaky_bucket.py

```
14
15  avg_arrival_rate=int(input("Enter the Avrage arrival rate : "))
16  bucket_capacity=int(input("Enter Bucket Capacity : "))
17  avg_transmission_rate=int(input("Enter the Avrage Transmission
        rate : "))
18  maximum_data=int(input("Enter the maximum data : "))
19  x=0
20  y=maximum_data
21  filed_bucket=0
22  i=1
```

Filter | All Output

```
Enter the Avrage arrival rate : 50
Enter Bucket Capacity : 75
Enter the Avrage Transmission rate : 45
Enter the maximum data : 500


*** After 1 Sec ****

new tokens Genrated(arrival) : 54
Packet in Buffer storage : 9


*** After 2 Sec ****

new tokens Genrated(arrival) : 41
Packet in Buffer storage : 5


*** After 3 Sec ****

new tokens Genrated(arrival) : 60
Packet in Buffer storage : 20
```

Run Succeeded | Time 751 ms | Peak Memory 22.8M | Symbol | Spaces: 4 | Line 1, Column 1