In [11]:
```
from collections import Counter
from collections import defaultdict
import random
import psutil
import numpy as np
import pandas as pd
import math
import collections
import matplotlib.pyplot as plt
```

```
Matplotlib is building the font cache; this may take a moment.
```

In [12]:
```
cpu=psutil.cpu_percent()
ram=psutil.virtual_memory().total
ram_uso=psutil.virtual_memory().used
cache = psutil.virtual_memory()
```

In [14]:
```
valores =[2317, 9823, 1639, 4820, 3792]
arreglorn=[]
def get_pos(digs):
    val1 =0
    val2 =0
    if digs%2 !=0:
        val1 = int(digs/2)
        val2 = int(digs/2)+1
    else:
        val1 = int(digs/2)
        val2 = int(digs/2)
    return val1,val2

def calcular_num(iters, val, digs):
    x0_semilla = int(val)
    aum = get_pos(digs)
    print("ITERACIÓN", "Xn", "Xn*Xn", "Longitud","Ui","Rn")
    for i in range(iters):
        xn2= x0_semilla**2
        lon = len(str(xn2))
        ui = str(xn2)[int(lon/2)-aum[0]:int(lon/2)+aum[1]]
        rn = int(ui)/10**digs
        arreglorn.append(rn)
        #df=pd.DataFrame({"Xn":x0_semilla, "Xn*Xn":xn2 ,"Longitud":lon, "UI ":ui, "RN":
        print(i, " ", x0_semilla," ",xn2, " ", lon, " ",ui, " ", rn)
        x0_semilla=int(ui)
    print("    ")
iters = int(input("Iteraciones: "))
digs = int(input("Ingrese el digito: "))
for i in valores:
    print("************************************************************")
    print("i: ", i)
    calcular_num(iters, i, digs)
```

```
Iteraciones: 25
Ingrese el digito: 5
************************************************************
i:  2317
ITERACIÓN Xn Xn*Xn Longitud Ui Rn
0   2317   5368489   7   36848   0.36848
```

1 36848 1357775104 10 77751 0.77751
2 77751 6045218001 10 52180 0.5218
3 52180 2722752400 10 27524 0.27524
4 27524 757570576 9 75705 0.75705
5 75705 5731247025 10 12470 0.1247
6 12470 155500900 9 55009 0.55009
7 55009 3025990081 10 59900 0.599
8 59900 3588010000 10 80100 0.801
9 80100 6416010000 10 60100 0.601
10 60100 3612010000 10 20100 0.201
11 20100 404010000 9 40100 0.401
12 40100 1608010000 10 80100 0.801
13 80100 6416010000 10 60100 0.601
14 60100 3612010000 10 20100 0.201
15 20100 404010000 9 40100 0.401
16 40100 1608010000 10 80100 0.801
17 80100 6416010000 10 60100 0.601
18 60100 3612010000 10 20100 0.201
19 20100 404010000 9 40100 0.401
20 40100 1608010000 10 80100 0.801
21 80100 6416010000 10 60100 0.601
22 60100 3612010000 10 20100 0.201
23 20100 404010000 9 40100 0.401
24 40100 1608010000 10 80100 0.801

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i: 9823
ITERACIÓN Xn Xn*Xn Longitud Ui Rn
0 9823 96491329 8 49132 0.49132
1 49132 2413953424 10 39534 0.39534
2 39534 1562937156 10 29371 0.29371
3 29371 862655641 9 26556 0.26556
4 26556 705221136 9 52211 0.52211
5 52211 2725988521 10 59885 0.59885
6 59885 3586213225 10 62132 0.62132
7 62132 3860385424 10 03854 0.03854
8 3854 14853316 8 85331 0.85331
9 85331 7281379561 10 13795 0.13795
10 13795 190302025 9 03020 0.0302
11 3020 9120400 7 12040 0.1204
12 12040 144961600 9 49616 0.49616
13 49616 2461747456 10 17474 0.17474
14 17474 305340676 9 53406 0.53406
15 53406 2852200836 10 22008 0.22008
16 22008 484352064 9 43520 0.4352
17 43520 1893990400 10 39904 0.39904
18 39904 1592329216 10 23292 0.23292
19 23292 542517264 9 25172 0.25172
20 25172 633629584 9 36295 0.36295
21 36295 1317327025 10 73270 0.7327
22 73270 5368492900 10 84929 0.84929
23 84929 7212935041 10 29350 0.2935
24 29350 861422500 9 14225 0.14225

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i: 1639
ITERACIÓN Xn Xn*Xn Longitud Ui Rn
0 1639 2686321 7 68632 0.68632
1 68632 4710351424 10 03514 0.03514
2 3514 12348196 8 34819 0.34819
3 34819 1212362761 10 23627 0.23627
4 23627 558235129 9 82351 0.82351
5 82351 6781687201 10 16872 0.16872
6 16872 284664384 9 46643 0.46643
7 46643 2175569449 10 55694 0.55694

```
8   55694   3101821636   10   18216   0.18216
9   18216   331822656   9   18226   0.18226
10   18226   332187076   9   21870   0.2187
11   21870   478296900   9   82969   0.82969
12   82969   6883854961   10   38549   0.38549
13   38549   1486025401   10   60254   0.60254
14   60254   3630544516   10   05445   0.05445
15   5445   29648025   8   64802   0.64802
16   64802   4199299204   10   92992   0.92992
17   92992   8647512064   10   75120   0.7512
18   75120   5643014400   10   30144   0.30144
19   30144   908660736   9   86607   0.86607
20   86607   7500772449   10   07724   0.07724
21   7724   59660176   8   66017   0.66017
22   66017   4358244289   10   82442   0.82442
23   82442   6796683364   10   66833   0.66833
24   66833   4466649889   10   66498   0.66498

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i:  4820
ITERACIÓN Xn Xn*Xn Longitud Ui Rn
0   4820   23232400   8   23240   0.2324
1   23240   540097600   9   00976   0.00976
2   976   952576   6   52576   0.52576
3   52576   2764235776   10   42357   0.42357
4   42357   1794115449   10   41154   0.41154
5   41154   1693651716   10   36517   0.36517
6   36517   1333491289   10   34912   0.34912
7   34912   1218847744   10   88477   0.88477
8   88477   7828179529   10   81795   0.81795
9   81795   6690422025   10   04220   0.0422
10   4220   17808400   8   80840   0.8084
11   80840   6535105600   10   51056   0.51056
12   51056   2606715136   10   67151   0.67151
13   67151   4509256801   10   92568   0.92568
14   92568   8568834624   10   88346   0.88346
15   88346   7805015716   10   50157   0.50157
16   50157   2515724649   10   57246   0.57246
17   57246   3277104516   10   71045   0.71045
18   71045   5047392025   10   73920   0.7392
19   73920   5464166400   10   41664   0.41664
20   41664   1735888896   10   58888   0.58888
21   58888   3467796544   10   77965   0.77965
22   77965   6078541225   10   85412   0.85412
23   85412   7295209744   10   52097   0.52097
24   52097   2714097409   10   40974   0.40974

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i:  3792
ITERACIÓN Xn Xn*Xn Longitud Ui Rn
0   3792   14379264   8   37926   0.37926
1   37926   1438381476   10   83814   0.83814
2   83814   7024786596   10   47865   0.47865
3   47865   2291058225   10   10582   0.10582
4   10582   111978724   9   19787   0.19787
5   19787   391525369   9   15253   0.15253
6   15253   232654009   9   26540   0.2654
7   26540   704371600   9   43716   0.43716
8   43716   1911088656   10   10886   0.10886
9   10886   118504996   9   85049   0.85049
10   85049   7233332401   10   33324   0.33324
11   33324   1110488976   10   04889   0.04889
12   4889   23902321   8   90232   0.90232
13   90232   8141813824   10   18138   0.18138
14   18138   328987044   9   89870   0.8987
```

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15   89870   8076616900   10   66169   0.66169
16   66169   4378336561   10   83365   0.83365
17   83365   6949723225   10   97232   0.97232
18   97232   9454061824   10   40618   0.40618
19   40618   1649821924   10   98219   0.98219
20   98219   9646971961   10   69719   0.69719
21   69719   4860738961   10   07389   0.07389
22   7389   54597321   8   59732   0.59732
23   59732   3567911824   10   79118   0.79118
24   79118   6259657924   10   96579   0.96579
```

In [ ]: