



# Point Park University

## Assignment ON:

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Course Code: ET204

Course Title: Programming for Engineering Technology

### **Submitted To:**

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Major: Electrical Engineering, NSET Department

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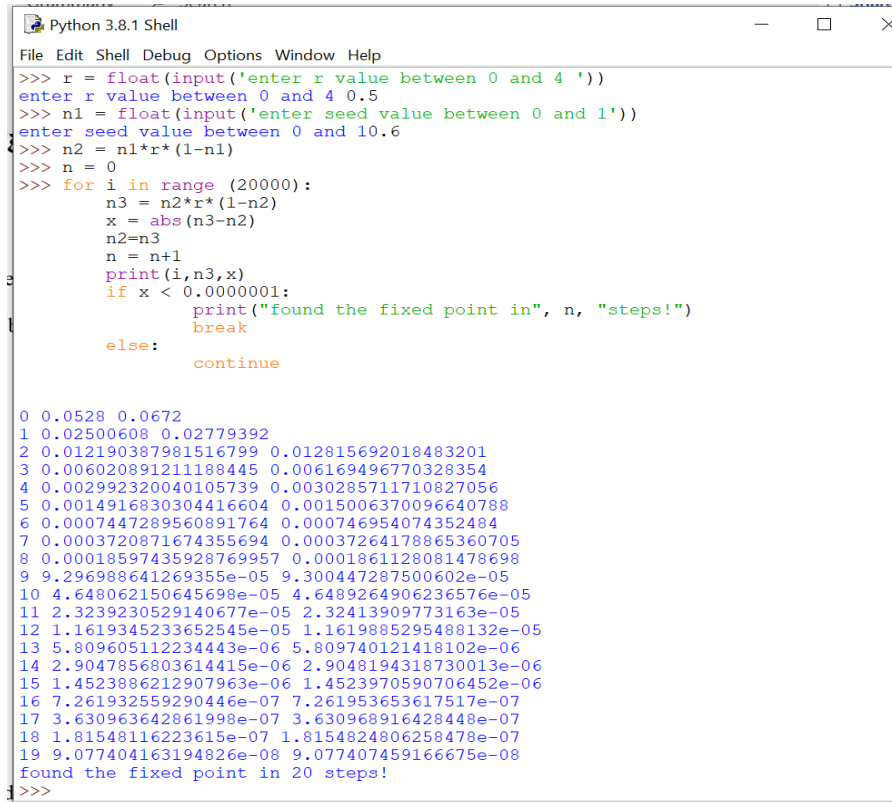
# Logistic Map

## Python Code:

```
r = float(input('enter r value between 0 and 4 '))
n1 = float(input('enter seed value between 0 and 1'))
n2 = n1*r*(1-n1)
n = 0
for i in range (20000):
    n3 = n2*r*(1-n2)
    x = abs(n3-n2)
    n2=n3
    n = n+1
    print(i,n3,x)
    if x < 0.0000001:
        print("found the fixed point in", n, "steps!")
        break
    else:
        continue
```

Output:

When  $R = 0.5$



```
Python 3.8.1 Shell
File Edit Shell Debug Options Window Help
>>> r = float(input('enter r value between 0 and 4 '))
enter r value between 0 and 4 0.5
>>> n1 = float(input('enter seed value between 0 and 1'))
enter seed value between 0 and 10.6
>>> n2 = n1*r*(1-n1)
>>> n = 0
>>> for i in range (20000):
    n3 = n2*r*(1-n2)
    x = abs(n3-n2)
    n2=n3
    n = n+1
    print(i,n3,x)
    if x < 0.0000001:
        print("found the fixed point in", n, "steps!")
        break
    else:
        continue

0 0.0528 0.0672
1 0.02500608 0.02779392
2 0.012190387981516799 0.012815692018483201
3 0.006020891211188445 0.006169496770328354
4 0.002992320040105739 0.0030285711710827056
5 0.0014916830304416604 0.0015006370096640788
6 0.0007447289560891764 0.000746954074352484
7 0.0003720871674355694 0.00037264178865360705
8 0.00018597435928769957 0.0001861128081478698
9 9.296988641269355e-05 9.300447287500602e-05
10 4.648062150645698e-05 4.6489264906236576e-05
11 2.3239230529140677e-05 2.32413909773163e-05
12 1.1619345233652545e-05 1.1619885295488132e-05
13 5.809605112234443e-06 5.809740121418102e-06
14 2.9047856803614415e-06 2.9048194318730013e-06
15 1.4523886212907963e-06 1.4523970590706452e-06
16 7.261932559290446e-07 7.261953653617517e-07
17 3.630963642861998e-07 3.630968916428448e-07
18 1.81548116223615e-07 1.8154824806258478e-07
19 9.077404163194826e-08 9.077407459166675e-08
found the fixed point in 20 steps!
>>>
```

When  $R = 3.5$

# Final Project

```
Python 3.8.1 Shell
File Edit Shell Debug Options Window Help
19960 0.5008842103072179 0.32605649628422084
19961 0.8749972636024641 0.37411305329524625
19962 0.38281968301732416 0.49217758058513994
19963 0.8269407065914387 0.44412102357411454
19964 0.5008842103072179 0.32605649628422084
19965 0.8749972636024641 0.37411305329524625
19966 0.38281968301732416 0.49217758058513994
19967 0.8269407065914387 0.44412102357411454
19968 0.5008842103072179 0.32605649628422084
19969 0.8749972636024641 0.37411305329524625
19970 0.38281968301732416 0.49217758058513994
19971 0.8269407065914387 0.44412102357411454
19972 0.5008842103072179 0.32605649628422084
19973 0.8749972636024641 0.37411305329524625
19974 0.38281968301732416 0.49217758058513994
19975 0.8269407065914387 0.44412102357411454
19976 0.5008842103072179 0.32605649628422084
19977 0.8749972636024641 0.37411305329524625
19978 0.38281968301732416 0.49217758058513994
19979 0.8269407065914387 0.44412102357411454
19980 0.5008842103072179 0.32605649628422084
19981 0.8749972636024641 0.37411305329524625
19982 0.38281968301732416 0.49217758058513994
19983 0.8269407065914387 0.44412102357411454
19984 0.5008842103072179 0.32605649628422084
19985 0.8749972636024641 0.37411305329524625
19986 0.38281968301732416 0.49217758058513994
19987 0.8269407065914387 0.44412102357411454
19988 0.5008842103072179 0.32605649628422084
19989 0.8749972636024641 0.37411305329524625
19990 0.38281968301732416 0.49217758058513994
19991 0.8269407065914387 0.44412102357411454
19992 0.5008842103072179 0.32605649628422084
19993 0.8749972636024641 0.37411305329524625
19994 0.38281968301732416 0.49217758058513994
19995 0.8269407065914387 0.44412102357411454
19996 0.5008842103072179 0.32605649628422084
19997 0.8749972636024641 0.37411305329524625
19998 0.38281968301732416 0.49217758058513994
19999 0.8269407065914387 0.44412102357411454
>>>
```

Date of Submission: 4/26/2020