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问题描述 根据上面的分析，取$b=[2.5,3.5]$，间隔0.01取值，计算差分方程的收敛点。 要求： 1. 程序源代码 2. 列表记录对应b的不同取值的收敛点 3. 作出收敛点关于b的取值图

问题求解

1、代码

```matlab
b=[2.5:0.01:3.5];

x=zeros(1,length(b));

x0=0.2;

x(1,:)=b*x0*(1-x0);

for k=1:99

x(k+1,:)=b.*x(k,:).*(1-x(k,:));

end

k=(85:100)';

disp(num2str([NaN,b;k,x(k,:)],4));

x=0:0.01:1;
b(1)=2.5;
hold on;
x(1)=0.2000;
for j=1:100
    b(j+1)=b(j)+0.01;
    for i=1:100
        x(i+1)=b(j)*x(i)*(1-x(i));
        if(i>50)
            plot(b(j),x(i),'r.');
        end
    end
end
xlabel('b');
hold off;
```

2、运行结果

```
NaN       2.5     2.51     2.52     2.53     2.54     2.55     2.56
     2.57      2.58     2.59      2.6     2.61     2.62     2.63
  2.64     2.65     2.66     2.67     2.68     2.69      2.7
2.71     2.72     2.73     2.74     2.75     2.76     2.77
2.78     2.79      2.8     2.81     2.82     2.83     2.84
2.85     2.86     2.87     2.88     2.89      2.9     2.91
2.92     2.93     2.94     2.95     2.96     2.97     2.98
2.99        3     3.01     3.02     3.03     3.04     3.05
3.06     3.07     3.08     3.09      3.1     3.11     3.12
3.13     3.14     3.15     3.16     3.17     3.18     3.19
 3.2     3.21     3.22     3.23     3.24     3.25     3.26
3.27     3.28     3.29      3.3     3.31     3.32     3.33
3.34     3.35     3.36     3.37     3.38     3.39      3.4
3.41     3.42     3.43     3.44     3.45     3.46     3.47
3.48     3.49      3.5


 85       0.6    0.6016    0.6032    0.6047    0.6063    0.6078    0.6094
    0.6109    0.6124    0.6139    0.6154    0.6169    0.6183    0.6198
0.6212    0.6226    0.6241    0.6255    0.6269    0.6283    0.6296
 0.631    0.6324    0.6337     0.635    0.6364    0.6377     0.639
0.6403    0.6416    0.6429    0.6441    0.6454    0.6466    0.6479
0.6491    0.6503    0.6516    0.6528     0.654    0.6552    0.6563
0.6575    0.6586    0.6595    0.6603    0.6605    0.6596    0.6567
0.6507    0.6413    0.6297     0.618    0.6075    0.5983    0.5902
0.5828    0.5759    0.5696    0.5636     0.558    0.5527    0.5476
0.5427     0.538    0.5335    0.5291    0.5249    0.5208    0.5169
 0.513    0.5093    0.5057    0.5021    0.4986    0.4953     0.492
0.4887    0.4856    0.4825    0.4794    0.4765    0.4735    0.4707
0.4679    0.4651    0.4624    0.4597    0.4571    0.4545     0.452
0.4495     0.447    0.4447    0.4431    0.4475     0.466    0.4785
0.4872    0.4944    0.5009


 86       0.6    0.6016    0.6032    0.6047    0.6063    0.6078    0.6094
    0.6109    0.6124    0.6139    0.6154    0.6169    0.6183    0.6198
0.6212    0.6226    0.6241    0.6255    0.6269    0.6283    0.6296
 0.631    0.6324    0.6337     0.635    0.6364    0.6377     0.639
0.6403    0.6416    0.6429    0.6441    0.6454    0.6466    0.6479
0.6491    0.6503    0.6516    0.6528     0.654    0.6552    0.6564
0.6576    0.6588    0.6602    0.6617    0.6638    0.6669    0.6718
0.6796    0.6901    0.7019    0.7129    0.7225    0.7306    0.7377
 0.744    0.7498    0.7551      0.76    0.7646    0.7689    0.7729
0.7768    0.7805     0.784    0.7873    0.7905    0.7936    0.7966
```

```
0.7995      0.8022      0.8049      0.8075      0.81      0.8124      0.8148
0.8171      0.8193      0.8215      0.8236      0.8257      0.8277      0.8296
0.8315      0.8334      0.8352      0.837      0.8388      0.8405      0.8422
0.8438      0.8454      0.847      0.8489      0.853      0.861      0.8659
0.8694      0.8724      0.875

 87          0.6      0.6016      0.6032      0.6047      0.6063      0.6078      0.6094
     0.6109      0.6124      0.6139      0.6154      0.6169      0.6183      0.6198
0.6212      0.6226      0.6241      0.6255      0.6269      0.6283      0.6296
 0.631      0.6324      0.6337      0.635      0.6364      0.6377      0.639
0.6403      0.6416      0.6429      0.6441      0.6454      0.6466      0.6479
0.6491      0.6503      0.6516      0.6528      0.654      0.6552      0.6563
0.6575      0.6586      0.6596      0.6603      0.6606      0.6598      0.657
0.6511      0.6416      0.6298      0.6181      0.6076      0.5983      0.5902
0.5828      0.5759      0.5696      0.5636      0.558      0.5527      0.5476
0.5427      0.538      0.5335      0.5291      0.5249      0.5208      0.5169
 0.513      0.5093      0.5057      0.5021      0.4986      0.4953      0.492
0.4887      0.4856      0.4825      0.4794      0.4765      0.4735      0.4707
0.4679      0.4651      0.4624      0.4597      0.4571      0.4545      0.452
0.4495      0.447      0.4445      0.4413      0.4327      0.4141      0.4029
0.3951      0.3885      0.3828

 88          0.6      0.6016      0.6032      0.6047      0.6063      0.6078      0.6094
     0.6109      0.6124      0.6139      0.6154      0.6169      0.6183      0.6198
0.6212      0.6226      0.6241      0.6255      0.6269      0.6283      0.6296
 0.631      0.6324      0.6337      0.635      0.6364      0.6377      0.639
0.6403      0.6416      0.6429      0.6441      0.6454      0.6466      0.6479
0.6491      0.6503      0.6516      0.6528      0.654      0.6552      0.6564
0.6576      0.6588      0.6601      0.6617      0.6637      0.6667      0.6715
0.6792      0.6899      0.7018      0.7129      0.7225      0.7306      0.7377
 0.744      0.7498      0.7551      0.76      0.7646      0.7689      0.7729
0.7768      0.7805      0.784      0.7873      0.7905      0.7936      0.7966
0.7995      0.8022      0.8049      0.8075      0.81      0.8124      0.8148
0.8171      0.8193      0.8215      0.8236      0.8257      0.8277      0.8296
0.8315      0.8334      0.8352      0.837      0.8388      0.8405      0.8422
0.8438      0.8454      0.8469      0.8481      0.8469      0.8395      0.8348
0.8317      0.8291      0.8269

 89          0.6      0.6016      0.6032      0.6047      0.6063      0.6078      0.6094
     0.6109      0.6124      0.6139      0.6154      0.6169      0.6183      0.6198
0.6212      0.6226      0.6241      0.6255      0.6269      0.6283      0.6296
 0.631      0.6324      0.6337      0.635      0.6364      0.6377      0.639
0.6403      0.6416      0.6429      0.6441      0.6454      0.6466      0.6479
```

```
0.6491    0.6503    0.6516    0.6528    0.654    0.6552    0.6563
0.6575    0.6586    0.6596    0.6604    0.6607    0.66      0.6573
0.6514    0.6418    0.6299    0.6181    0.6076    0.5983    0.5902
0.5828    0.5759    0.5696    0.5636    0.558    0.5527    0.5476
0.5427    0.538     0.5335    0.5291    0.5249    0.5208    0.5169
0.513     0.5093    0.5057    0.5021    0.4986    0.4953    0.492
0.4887    0.4856    0.4825    0.4794    0.4765    0.4735    0.4707
0.4679    0.4651    0.4624    0.4597    0.4571    0.4545    0.452
0.4495    0.447     0.4447    0.443     0.4474    0.4663    0.4785
0.4872    0.4944    0.5009
```

```
90        0.6     0.6016    0.6032    0.6047    0.6063    0.6078    0.6094
   0.6109    0.6124    0.6139    0.6154    0.6169    0.6183    0.6198
0.6212    0.6226    0.6241    0.6255    0.6269    0.6283    0.6296
0.631     0.6324    0.6337    0.635    0.6364    0.6377    0.639
0.6403    0.6416    0.6429    0.6441    0.6454    0.6466    0.6479
0.6491    0.6503    0.6516    0.6528    0.654    0.6552    0.6564
0.6576    0.6588    0.6601    0.6616    0.6635    0.6665    0.6712
0.6789    0.6896    0.7017    0.7129    0.7224    0.7306    0.7377
0.744     0.7498    0.7551    0.76     0.7646    0.7689    0.7729
0.7768    0.7805    0.784     0.7873    0.7905    0.7936    0.7966
0.7995    0.8022    0.8049    0.8075    0.81     0.8124    0.8148
0.8171    0.8193    0.8215    0.8236    0.8257    0.8277    0.8296
0.8315    0.8334    0.8352    0.837    0.8388    0.8405    0.8422
0.8438    0.8454    0.847     0.8488    0.853    0.8611    0.8659
0.8694    0.8724    0.875
```

```
91        0.6     0.6016    0.6032    0.6047    0.6063    0.6078    0.6094
   0.6109    0.6124    0.6139    0.6154    0.6169    0.6183    0.6198
0.6212    0.6226    0.6241    0.6255    0.6269    0.6283    0.6296
0.631     0.6324    0.6337    0.635    0.6364    0.6377    0.639
0.6403    0.6416    0.6429    0.6441    0.6454    0.6466    0.6479
0.6491    0.6503    0.6516    0.6528    0.654    0.6552    0.6563
0.6575    0.6586    0.6596    0.6605    0.6608    0.6602    0.6576
0.6518    0.6421    0.6301    0.6181    0.6076    0.5983    0.5902
0.5828    0.5759    0.5696    0.5636    0.558    0.5527    0.5476
0.5427    0.538     0.5335    0.5291    0.5249    0.5208    0.5169
0.513     0.5093    0.5057    0.5021    0.4986    0.4953    0.492
0.4887    0.4856    0.4825    0.4794    0.4765    0.4735    0.4707
0.4679    0.4651    0.4624    0.4597    0.4571    0.4545    0.452
0.4495    0.447     0.4445    0.4414    0.4327    0.4139    0.4029
0.3951    0.3885    0.3828
```

```
92        0.6     0.6016     0.6032     0.6047     0.6063     0.6078     0.6094
     0.6109     0.6124     0.6139     0.6154     0.6169     0.6183     0.6198
0.6212     0.6226     0.6241     0.6255     0.6269     0.6283     0.6296
 0.631     0.6324     0.6337      0.635     0.6364     0.6377      0.639
0.6403     0.6416     0.6429     0.6441     0.6454     0.6466     0.6479
0.6491     0.6503     0.6516     0.6528      0.654     0.6552     0.6564
0.6576     0.6588     0.6601     0.6615     0.6634     0.6663      0.671
0.6786     0.6894     0.7016     0.7128     0.7224     0.7306     0.7377
 0.744     0.7498     0.7551       0.76     0.7646     0.7689     0.7729
0.7768     0.7805      0.784     0.7873     0.7905     0.7936     0.7966
0.7995     0.8022     0.8049     0.8075       0.81     0.8124     0.8148
0.8171     0.8193     0.8215     0.8236     0.8257     0.8277     0.8296
0.8315     0.8334     0.8352      0.837     0.8388     0.8405     0.8422
0.8438     0.8454     0.8469     0.8482     0.8469     0.8394     0.8348
0.8317     0.8291     0.8269


93        0.6     0.6016     0.6032     0.6047     0.6063     0.6078     0.6094
     0.6109     0.6124     0.6139     0.6154     0.6169     0.6183     0.6198
0.6212     0.6226     0.6241     0.6255     0.6269     0.6283     0.6296
 0.631     0.6324     0.6337      0.635     0.6364     0.6377      0.639
0.6403     0.6416     0.6429     0.6441     0.6454     0.6466     0.6479
0.6491     0.6503     0.6516     0.6528      0.654     0.6552     0.6563
0.6575     0.6586     0.6597     0.6605     0.6609     0.6604     0.6579
0.6521     0.6424     0.6302     0.6182     0.6076     0.5983     0.5902
0.5828     0.5759     0.5696     0.5636      0.558     0.5527     0.5476
0.5427      0.538     0.5335     0.5291     0.5249     0.5208     0.5169
 0.513     0.5093     0.5057     0.5021     0.4986     0.4953      0.492
0.4887     0.4856     0.4825     0.4794     0.4765     0.4735     0.4707
0.4679     0.4651     0.4624     0.4597     0.4571     0.4545      0.452
0.4495      0.447     0.4446      0.443     0.4474     0.4665     0.4786
0.4872     0.4944     0.5009


94        0.6     0.6016     0.6032     0.6047     0.6063     0.6078     0.6094
     0.6109     0.6124     0.6139     0.6154     0.6169     0.6183     0.6198
0.6212     0.6226     0.6241     0.6255     0.6269     0.6283     0.6296
 0.631     0.6324     0.6337      0.635     0.6364     0.6377      0.639
0.6403     0.6416     0.6429     0.6441     0.6454     0.6466     0.6479
0.6491     0.6503     0.6516     0.6528      0.654     0.6552     0.6564
0.6576     0.6588     0.6601     0.6615     0.6633     0.6661     0.6707
0.6783     0.6892     0.7015     0.7128     0.7224     0.7306     0.7377
 0.744     0.7498     0.7551       0.76     0.7646     0.7689     0.7729
0.7768     0.7805      0.784     0.7873     0.7905     0.7936     0.7966
0.7995     0.8022     0.8049     0.8075       0.81     0.8124     0.8148
```

```
0.8171     0.8193     0.8215     0.8236     0.8257     0.8277     0.8296
0.8315     0.8334     0.8352      0.837     0.8388     0.8405     0.8422
0.8438     0.8454      0.847     0.8488      0.853     0.8611     0.8659
0.8694     0.8724      0.875


 95         0.6      0.6016     0.6032     0.6047     0.6063     0.6078     0.6094
     0.6109     0.6124     0.6139     0.6154     0.6169     0.6183     0.6198
0.6212     0.6226     0.6241     0.6255     0.6269     0.6283     0.6296
 0.631     0.6324     0.6337      0.635     0.6364     0.6377      0.639
0.6403     0.6416     0.6429     0.6441     0.6454     0.6466     0.6479
0.6491     0.6503     0.6516     0.6528      0.654     0.6552     0.6563
0.6575     0.6586     0.6597     0.6606      0.661     0.6606     0.6582
0.6524     0.6426     0.6303     0.6182     0.6076     0.5984     0.5902
0.5828     0.5759     0.5696     0.5636      0.558     0.5527     0.5476
0.5427      0.538     0.5335     0.5291     0.5249     0.5208     0.5169
 0.513     0.5093     0.5057     0.5021     0.4986     0.4953      0.492
0.4887     0.4856     0.4825     0.4794     0.4765     0.4735     0.4707
0.4679     0.4651     0.4624     0.4597     0.4571     0.4545      0.452
0.4495      0.447     0.4445     0.4415     0.4327     0.4138     0.4029
0.3951     0.3885     0.3828


 96         0.6      0.6016     0.6032     0.6047     0.6063     0.6078     0.6094
     0.6109     0.6124     0.6139     0.6154     0.6169     0.6183     0.6198
0.6212     0.6226     0.6241     0.6255     0.6269     0.6283     0.6296
 0.631     0.6324     0.6337      0.635     0.6364     0.6377      0.639
0.6403     0.6416     0.6429     0.6441     0.6454     0.6466     0.6479
0.6491     0.6503     0.6516     0.6528      0.654     0.6552     0.6564
0.6576     0.6588       0.66     0.6614     0.6632     0.6659     0.6705
 0.678      0.689     0.7014     0.7128     0.7224     0.7306     0.7377
 0.744     0.7498     0.7551       0.76     0.7646     0.7689     0.7729
0.7768     0.7805      0.784     0.7873     0.7905     0.7936     0.7966
0.7995     0.8022     0.8049     0.8075       0.81     0.8124     0.8148
0.8171     0.8193     0.8215     0.8236     0.8257     0.8277     0.8296
0.8315     0.8334     0.8352      0.837     0.8388     0.8405     0.8422
0.8438     0.8454     0.8469     0.8482     0.8469     0.8393     0.8348
0.8317     0.8291     0.8269


 97         0.6      0.6016     0.6032     0.6047     0.6063     0.6078     0.6094
     0.6109     0.6124     0.6139     0.6154     0.6169     0.6183     0.6198
0.6212     0.6226     0.6241     0.6255     0.6269     0.6283     0.6296
 0.631     0.6324     0.6337      0.635     0.6364     0.6377      0.639
0.6403     0.6416     0.6429     0.6441     0.6454     0.6466     0.6479
0.6491     0.6503     0.6516     0.6528      0.654     0.6552     0.6563
```

0.6575	0.6586	0.6597	0.6606	0.6611	0.6607	0.6584
0.6527	0.6429	0.6304	0.6183	0.6076	0.5984	0.5902
0.5828	0.5759	0.5696	0.5636	0.558	0.5527	0.5476
0.5427	0.538	0.5335	0.5291	0.5249	0.5208	0.5169
0.513	0.5093	0.5057	0.5021	0.4986	0.4953	0.492
0.4887	0.4856	0.4825	0.4794	0.4765	0.4735	0.4707
0.4679	0.4651	0.4624	0.4597	0.4571	0.4545	0.452
0.4495	0.447	0.4446	0.4429	0.4474	0.4667	0.4786
0.4872	0.4944	0.5009				

98	0.6	0.6016	0.6032	0.6047	0.6063	0.6078	0.6094
	0.6109	0.6124	0.6139	0.6154	0.6169	0.6183	0.6198
0.6212	0.6226	0.6241	0.6255	0.6269	0.6283	0.6296	
0.631	0.6324	0.6337	0.635	0.6364	0.6377	0.639	
0.6403	0.6416	0.6429	0.6441	0.6454	0.6466	0.6479	
0.6491	0.6503	0.6516	0.6528	0.654	0.6552	0.6564	
0.6576	0.6588	0.66	0.6614	0.6632	0.6658	0.6702	
0.6778	0.6888	0.7013	0.7128	0.7224	0.7306	0.7377	
0.744	0.7498	0.7551	0.76	0.7646	0.7689	0.7729	
0.7768	0.7805	0.784	0.7873	0.7905	0.7936	0.7966	
0.7995	0.8022	0.8049	0.8075	0.81	0.8124	0.8148	
0.8171	0.8193	0.8215	0.8236	0.8257	0.8277	0.8296	
0.8315	0.8334	0.8352	0.837	0.8388	0.8405	0.8422	
0.8438	0.8454	0.847	0.8488	0.853	0.8612	0.8659	
0.8694	0.8724	0.875					

99	0.6	0.6016	0.6032	0.6047	0.6063	0.6078	0.6094
	0.6109	0.6124	0.6139	0.6154	0.6169	0.6183	0.6198
0.6212	0.6226	0.6241	0.6255	0.6269	0.6283	0.6296	
0.631	0.6324	0.6337	0.635	0.6364	0.6377	0.639	
0.6403	0.6416	0.6429	0.6441	0.6454	0.6466	0.6479	
0.6491	0.6503	0.6516	0.6528	0.654	0.6552	0.6564	
0.6575	0.6587	0.6597	0.6606	0.6612	0.6609	0.6587	
0.653	0.6431	0.6305	0.6183	0.6076	0.5984	0.5902	
0.5828	0.5759	0.5696	0.5636	0.558	0.5527	0.5476	
0.5427	0.538	0.5335	0.5291	0.5249	0.5208	0.5169	
0.513	0.5093	0.5057	0.5021	0.4986	0.4953	0.492	
0.4887	0.4856	0.4825	0.4794	0.4765	0.4735	0.4707	
0.4679	0.4651	0.4624	0.4597	0.4571	0.4545	0.452	
0.4495	0.447	0.4445	0.4415	0.4327	0.4137	0.4029	
0.3951	0.3885	0.3828					

100	0.6	0.6016	0.6032	0.6047	0.6063	0.6078	0.6094

```
         0.6109        0.6124        0.6139        0.6154        0.6169        0.6183        0.6198
  0.6212        0.6226        0.6241        0.6255        0.6269        0.6283        0.6296
   0.631        0.6324        0.6337         0.635        0.6364        0.6377         0.639
  0.6403        0.6416        0.6429        0.6441        0.6454        0.6466        0.6479
  0.6491        0.6503        0.6516        0.6528         0.654        0.6552        0.6564
  0.6576        0.6587          0.66        0.6614        0.6631        0.6656          0.67
  0.6775        0.6886        0.7012        0.7127        0.7224        0.7306        0.7377
   0.744        0.7498        0.7551          0.76        0.7646        0.7689        0.7729
  0.7768        0.7805         0.784        0.7873        0.7905        0.7936        0.7966
  0.7995        0.8022        0.8049        0.8075          0.81        0.8124        0.8148
  0.8171        0.8193        0.8215        0.8236        0.8257        0.8277        0.8296
  0.8315        0.8334        0.8352         0.837        0.8388        0.8405        0.8422
  0.8438        0.8454        0.8469        0.8482        0.8469        0.8392        0.8348
  0.8317        0.8291        0.8269
```

3、结果图形