8.GM model simulation

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Use the spreadsheet to simulate the GM model

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starting x = 

the speed of follow car is 

输出output表（部分）：

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Time (second)** | **Position (meter) of lead car** | **speed of lead car** | **Position (meter) of follow car** | **speed of follow car** | **acceleration** |
| 0 | 2000 | 0 | 467 | 30 | 0 |
| 1 | 2000 | 0 | 496.5303 | 29.53033 | -0.46967 |
| 2 | 2000 | 0 | 525.5967 | 29.06632 | -0.46401 |
| 3 | 2000 | 0 | 554.2046 | 28.60791 | -0.45841 |
| 4 | 2000 | 0 | 582.3596 | 28.15506 | -0.45285 |
| 5 | 2000 | 0 | 610.0673 | 27.70772 | -0.44734 |
| 6 | 2000 | 0 | 637.3332 | 27.26584 | -0.44187 |
| 7 | 2000 | 0 | 664.1626 | 26.82939 | -0.43645 |
| 8 | 2000 | 0 | 690.5609 | 26.39831 | -0.43108 |
| 9 | 2000 | 0 | 716.5334 | 25.97256 | -0.42575 |
| 10 | 2000 | 0 | 742.0855 | 25.55209 | -0.42047 |

仿真结果：

效果较好

代码：

1. **import** pandas as pd
3. datas = pd.read\_excel('Lead+car+data.xlsx')
5. **for** i **in** range(0,500):
7. dv = datas.iloc[i,2]-datas.iloc[i,4]
8. dx = datas.iloc[i,1]-datas.iloc[i,3]
9. datas.iloc[i+1,5] = 0.8\*datas.iloc[i,4]\*dv/dx
10. #     datas.iloc[i+1,5] = 0.8\*dv/dx
12. datas.iloc[i+1,4] = max(0,datas.iloc[i,4]+datas.iloc[i+1,5])
13. datas.iloc[i+1,3] = datas.iloc[i,3]+datas.iloc[i+1,4]
15. datas.to\_excel('output.xlsx',index  =False)