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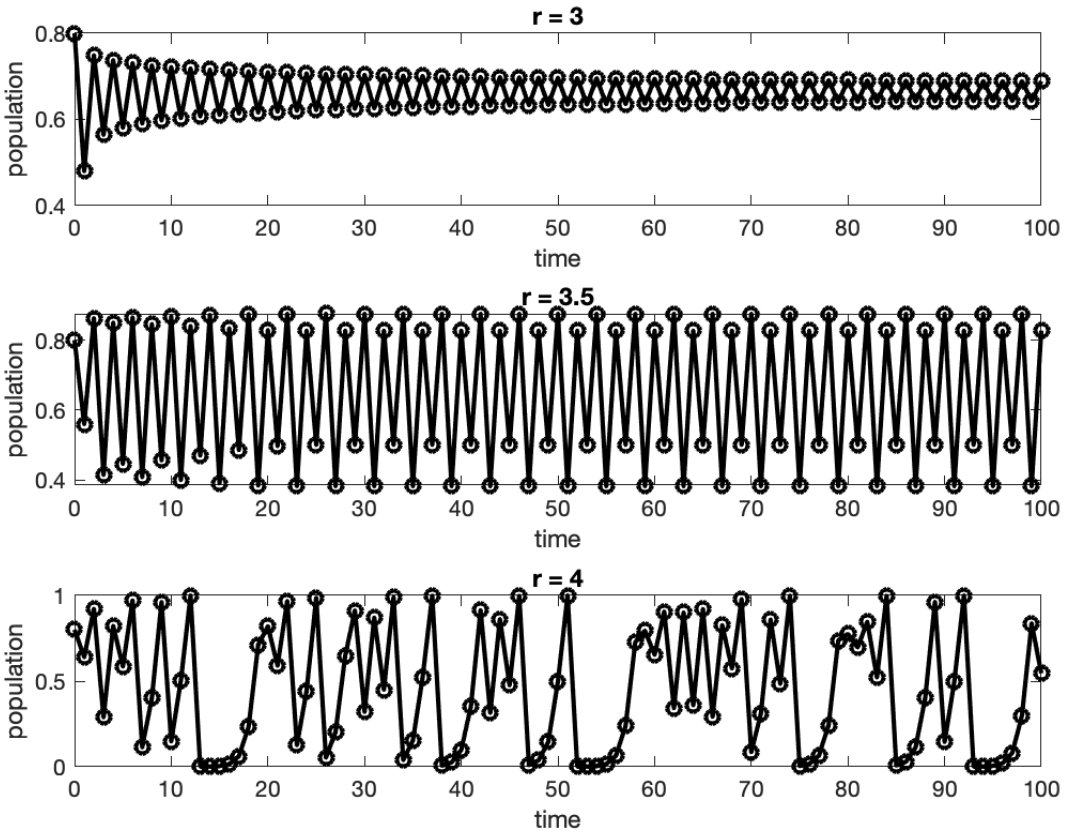
AMATH 301 Spring 2020
HW1

Problem 3

X1 and x3 are exactly zero, but x2 and x4 are not. 0.25, 0.2, 0.125 and 0.1 can be written as 1/4, 1/5, 1/8 and 1/10. Because things are stored with binary representation so 2^n is stored more accurately, thus we can get x1 and x3 exactly equal to zero.

Problem 4



Problem 5

D

Code

```
%Problem 3
sum1 = 0;
for k = 1:8000
    sum1 = sum1 + 0.25;
end
x1 = abs(2000-sum1);
disp(x1);

sum2 = 0;
for k = 1:10000
    sum2 = sum2 + 0.2;
end
x2 = abs(2000-sum2);
disp(x2);

sum3 = 0;
for k = 1:16000
    sum3 = sum3 + 0.125;
end
x3 = abs(2000-sum3);
disp(x3);

sum4 = 0;
for k = 1:20000
    sum4 = sum4 + 0.1;
end
x4 = abs(2000-sum4);
disp(x4);

%Problem 4
p = [1:101];
p(1) = 0.8;

for j = 1:3
    subplot(3,1,j)
    r = 3 + 0.5 * (j-1);
    for k = 2:101
        p(k) = r * p(k-1)*(1-p(k-1));
    end
    time = [0:100];
    plot(time, p, 'ko-', 'Linewidth', [2])

    xlabel('time')
    ylabel('population')
    title(['r = ' num2str(r)])
end
print('HW1_fig1.png','-dpng')
```