

Assignment 17

CS374

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Contents

1	Predator - Prey Model	3
1.1	Initial values	3
1.2	$Y_1(0) = 3$ and $Y_2(0) = 5$	4
1.2.1	Graph	4
1.3	$Y_1(0) = 3$ and $Y_2(0) = 1$	5
1.3.1	Graph	5
1.4	$Y_1(0) = 3$ and $Y_2(0) = 1.5$	6
1.4.1	Graph	6
1.5	$Y_1(0) = 3$ and $Y_2(0) = 1.9$	7
1.5.1	Graph	7

1 Predator - Prey Model

$$\begin{aligned}Y_1' &= AY_1(1 - BY_2) \\ Y_2' &= CY_2(DY_1 - 1)\end{aligned}$$

1.1 Initial values

$$A = 4$$

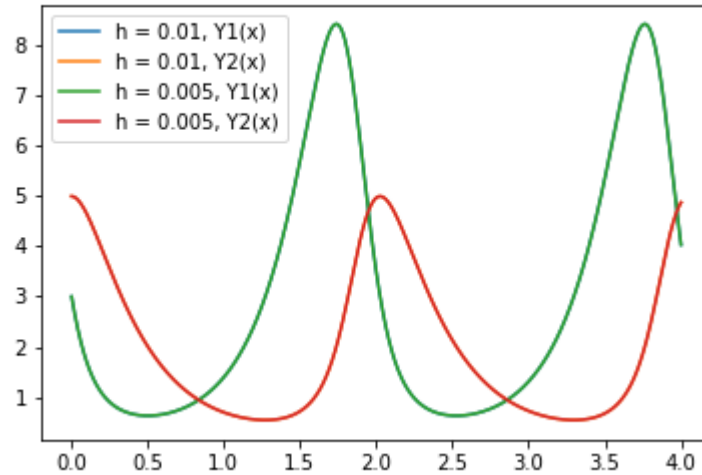
$$B = 0.5$$

$$C = 3$$

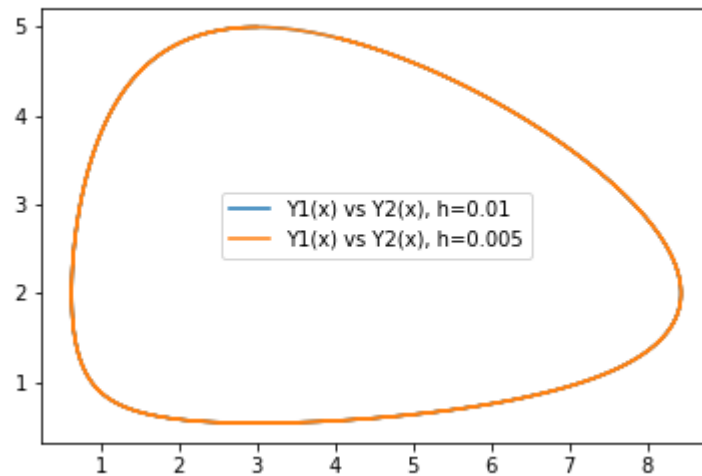
$$D = \frac{1}{3}$$

1.2 $Y_1(0) = 3$ and $Y_2(0) = 5$

1.2.1 Graph



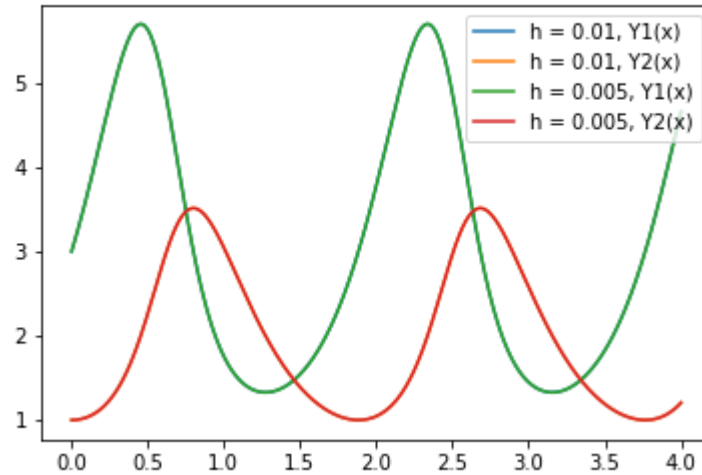
Plot of $Y_1(x)$ and $Y_2(x)$ versus x for $h = 0.01$ and $h = 0.005$



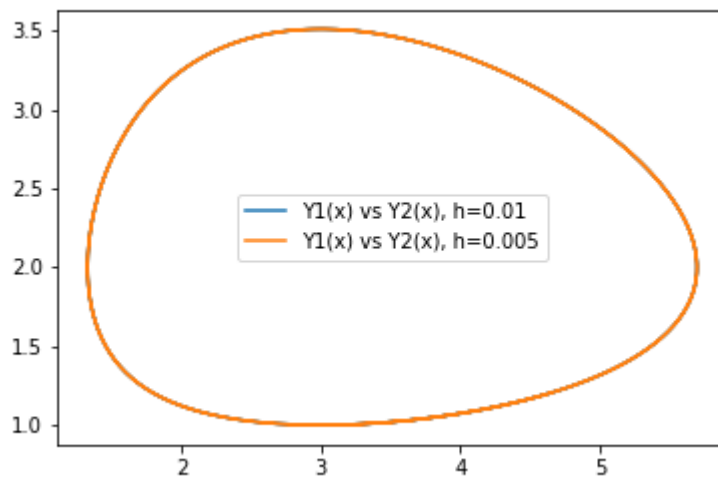
Plot of $Y_1(x)$ versus $Y_2(x)$ for $h = 0.01$ and $h = 0.005$

1.3 $Y_1(0) = 3$ and $Y_2(0) = 1$

1.3.1 Graph



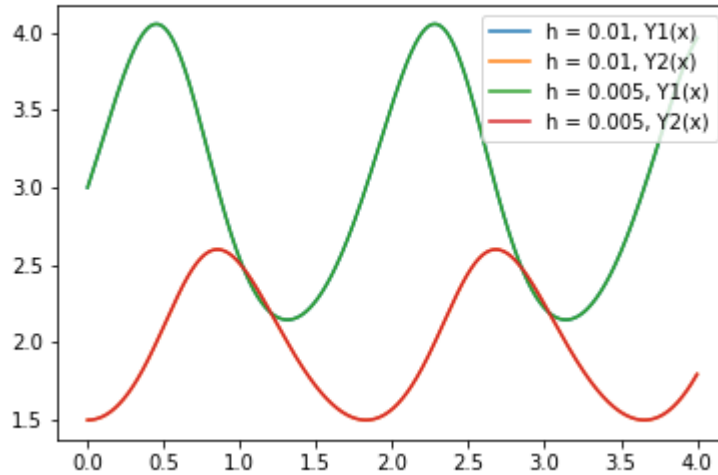
Plot of $Y_1(x)$ and $Y_2(x)$ versus x for $h = 0.01$ and $h = 0.005$



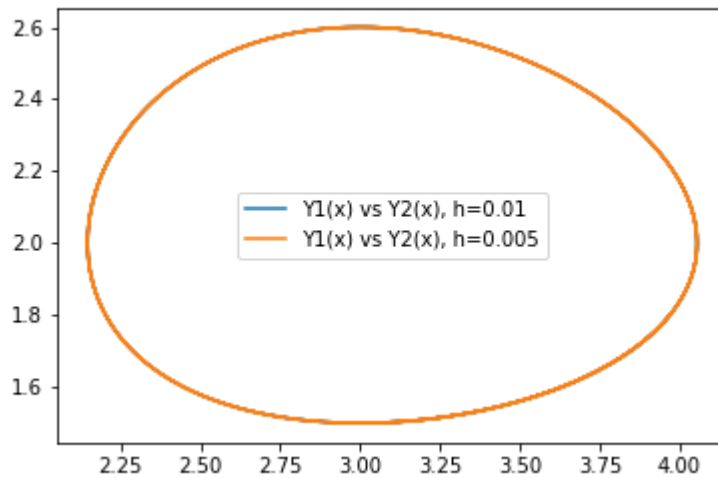
Plot of $Y_1(x)$ versus $Y_2(x)$ for $h = 0.01$ and $h = 0.005$

1.4 $Y_1(0) = 3$ and $Y_2(0) = 1.5$

1.4.1 Graph



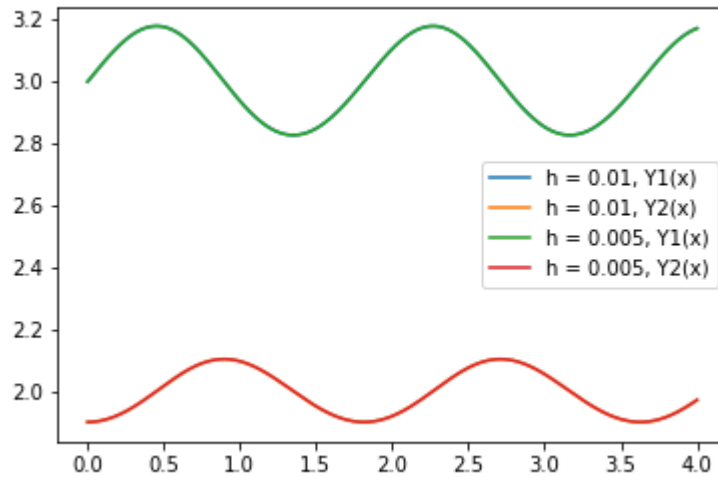
Plot of $Y_1(x)$ and $Y_2(x)$ versus x for $h = 0.01$ and $h = 0.005$



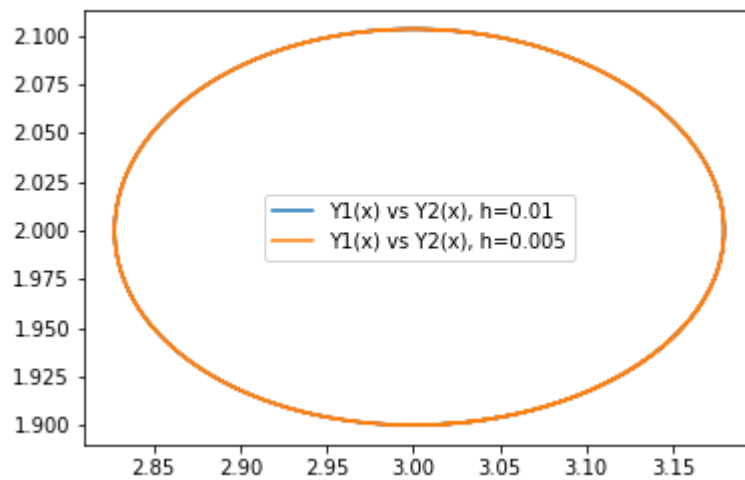
Plot of $Y_1(x)$ versus $Y_2(x)$ for $h = 0.01$ and $h = 0.005$

1.5 $Y_1(0) = 3$ and $Y_2(0) = 1.9$

1.5.1 Graph



Plot of $Y_1(x)$ and $Y_2(x)$ versus x for $h = 0.01$ and $h = 0.005$



Plot of $Y_1(x)$ versus $Y_2(x)$ for $h = 0.01$ and $h = 0.005$