



# CHAOS

Melikşah Türker

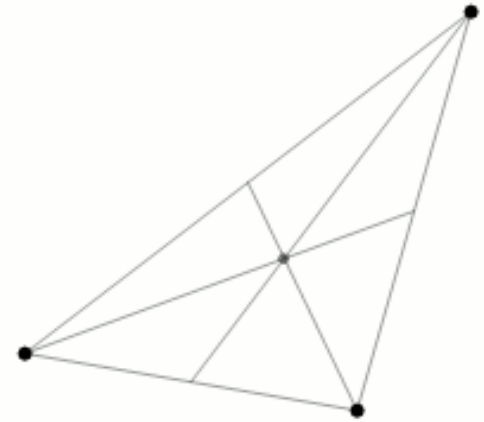
04.12.19

# Definiton

- Chaos theory is a branch of mathematics focusing on the study of chaos—states of dynamical systems whose **apparently-random** states of disorder and irregularities are often governed by deterministic laws that are **highly sensitive to initial conditions**.

# History

- 1880
  - Mathematician Henri Poincaré
  - Three Body Problem
- 1961
  - Meteorologist Edward Lorenz
  - Weather Forecast
- 2004
  - Popular Culture: Butterfly Effect movie

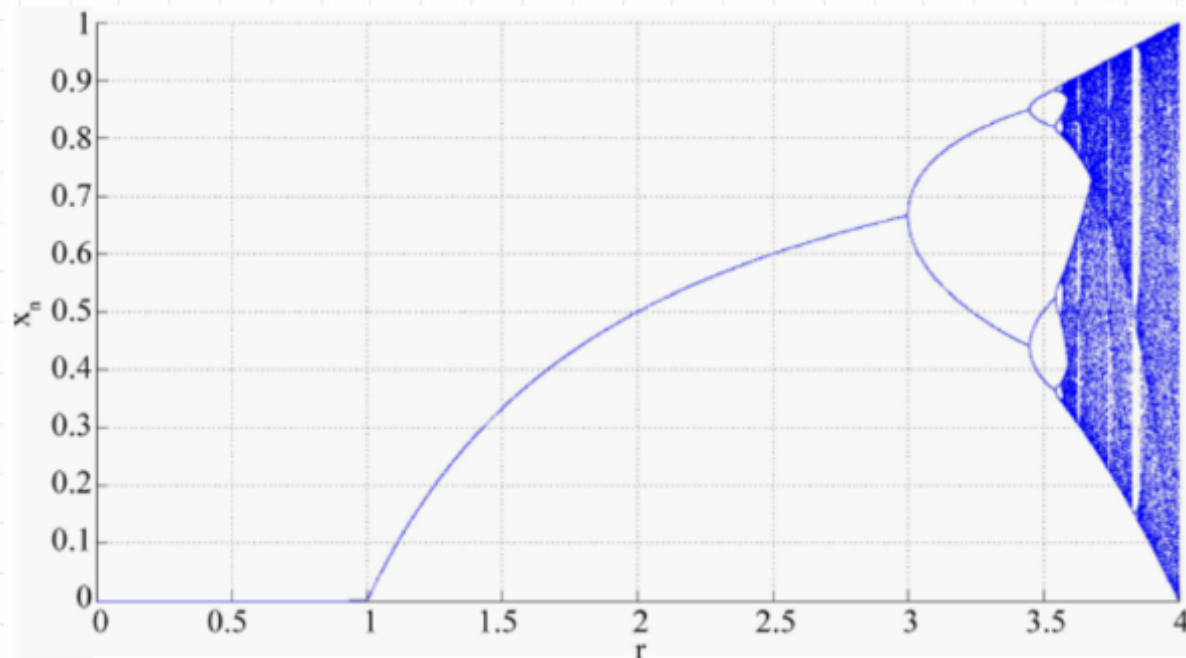


# Logistic Map Function

Logistic Map Function  $f : [0, 1] \rightarrow [0, 1]$  where  $0 \leq r \leq 4$

$$x_{n+1} = r x_n (1 - x_n)$$

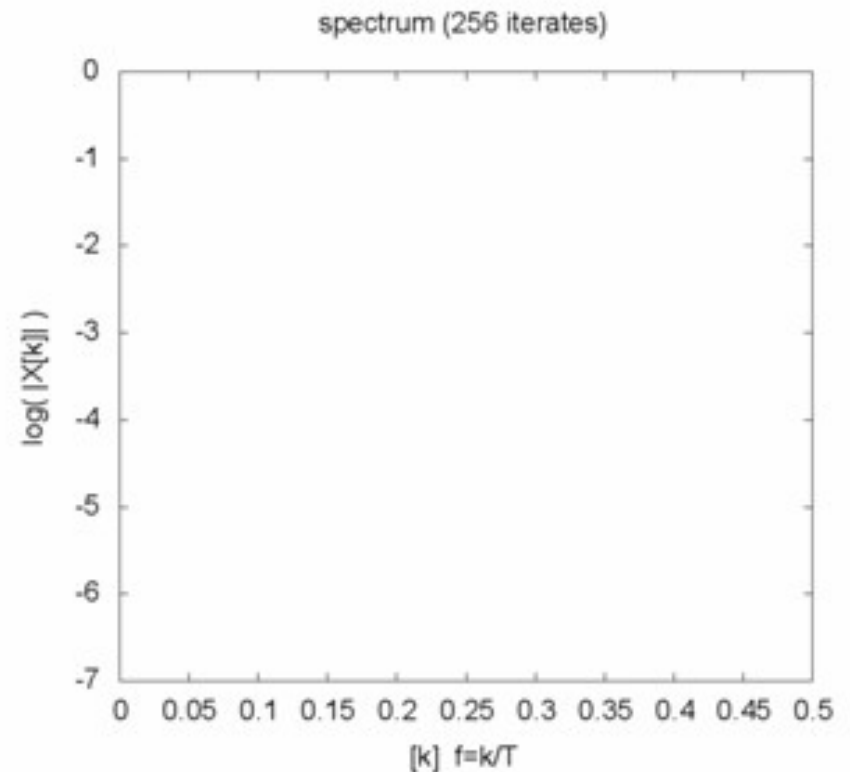
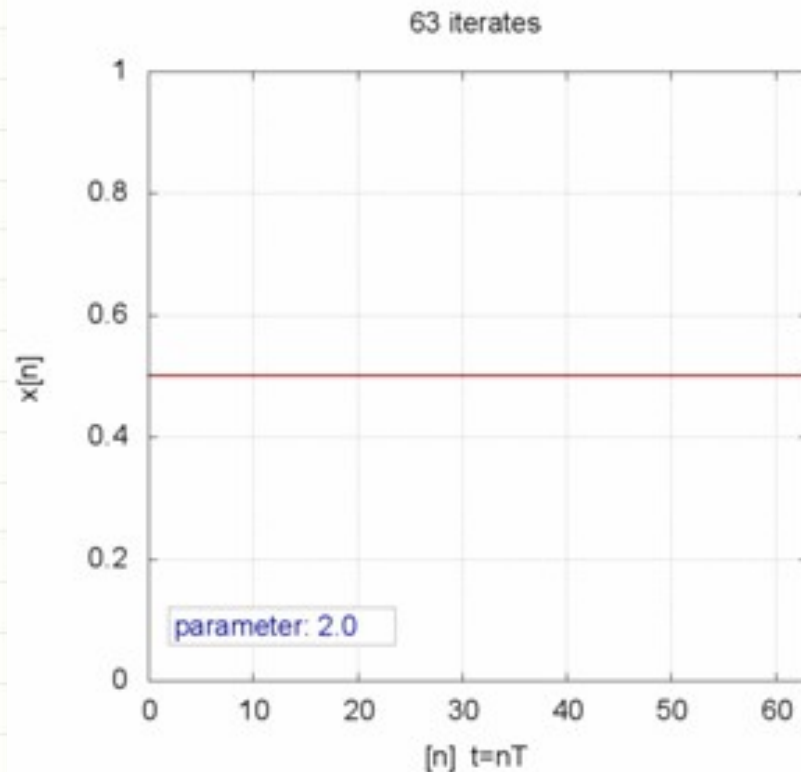
- 1971
  - Biologist Robert May
  - Discrete-time demographic model



# Logistic Map Function

Logistic Map Function  $f : [0, 1] \rightarrow [0, 1]$  where  $0 \leq r \leq 4$

$$x_{n+1} = r x_n (1 - x_n)$$





**THANK YOU  
ANY QUESTIONS?**