Simulation - Derivatives

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Outline

- Derivatives
- Second derivatives
- Partial Derivatives
- Dicretization

Derivatives

- Rate of change of a function (slope)

Derivatives

- Instantaneous rate of change of a function

Second derivative

- It describes the rate of change speed

Partial Derivatives

- The function varies jointly to a set of variables
- Strategy: Take one to work with and the others are constant

Discretization

- Taylor series about 0 (again)

Discretization

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Discretization

- The intermediate value theorem:
- If f is continuous on [a,b] and f(a) < k < f(b). Then, there exists at least one number c in the closed interval [a,b] for which f(c) = k

Right approximation method

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Left approximation method

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Central difference approximation method

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Second derivative approximation

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HW

- Code the second derivative approximation method (+10%)