Scientific Computing Lab

Content

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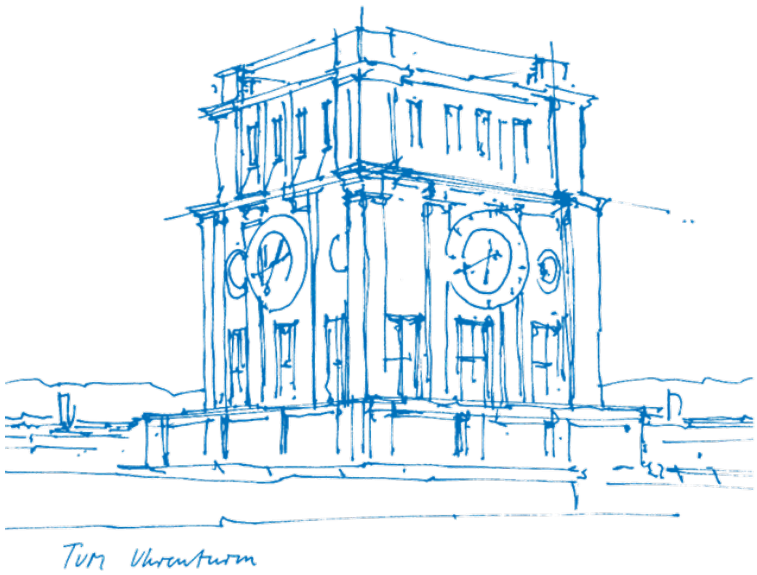
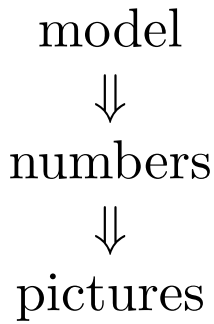
02.11.2017



Tasks

- getting a ”feeling”for Scientific Computing



quality?

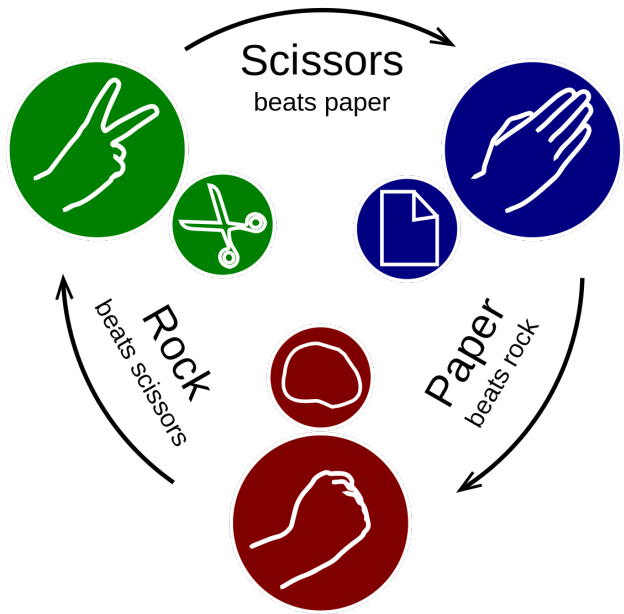
- accuracy
- costs
- robustness

Content

- discrete processes
- ordinary differential equations
  - initial value problems
- partial differential equations
  - boundary value problems
  - boundary+initial value problems

Worksheet 1: Rock-Paper-Scissors

- Hand game usually played by two people
- simoultaneously throw one of the three symbols: rock, paper, or scissors



source https://upload.wikimedia.org/

Worksheet 1: Rock-Paper-Scissors

- It's more popular as a basic child game, but there are professional championships: www.worldrps.com
- **?** Why study it?
- Game is as complex as the mind of your opponent

Worksheet 1: Rock-Paper-Scissors

- Game of chance? Humans rarely pick their throw randomly
- Game of Psychology? Study your opponent:


Typical Rock Player


Typical Paper Player


Typical Scissors Player

Rock: solid, fall back solution when other strategies appear to fail

Paper: considered as subtle, players may use it to show quiet power

Scissors: clever or crafty throw, mostly used when confident of winning

source worldrps.com

Worksheet 1: Rock-Paper-Scissors

Let's forget psychology, let's look at discrete events

Previous choice:

- Player: rock(you). Opponent: rock.

? What would you choose?

Worksheet 1: Rock-Paper-Scissors

Let's forget psychology, let's look at discrete events

Previous choice:

- Player: rock(you). Opponent: rock.

? What would you choose?

- You might choose paper, as it would beat rock.

Worksheet 1: Rock-Paper-Scissors

Let's forget psychology, let's look at discrete events

Previous choice:

- Player: rock(you). Opponent: rock.
- Player: paper(you). Opponent: paper.

? What would you choose?

Worksheet 1: Rock-Paper-Scissors

Let's forget psychology, let's look at discrete events

Previous choice:

- Player: rock(you). Opponent: rock.
- Player: paper(you). Opponent: paper.

? What would you choose?

- You might choose scissors, as it would beat paper.

Worksheet 1: Rock-Paper-Scissors

Let's forget psychology, let's look at discrete events

Previous choice:

- Player: rock(you). Opponent: rock.
- Player: paper(you). Opponent: paper.
- Player: scissors(you). Opponent: scissors.
- ...

Choice history:

? What would you choose if $\geq$50% of opponent's previous choices were rock?

Worksheet 1: Rock-Paper-Scissors

Let's forget psychology, let's look at discrete events

Previous choice:

- Player: rock(you). Opponent: rock.
- Player: paper(you). Opponent: paper.
- Player: scissors(you). Opponent: scissors.
- ...

Choice history:

? What would you choose if $\geq$50% of opponent's previous choices were rock?

- After multiple runs you can estimate your opponent's behaviour.

$\rightarrow$ In this worksheet you will implement your throw using a transition matrix