Title

— *Author* —

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1 Introduction

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1.1 Subsection

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1.1.1 Subsubsection

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2 Itemize and Enumerate

2.1 Itemize

- I am an item
- I am an item
- I am an item
  - I am an item
  - I am an item
  - I am an item
    - I am an item
    - I am an item
    - I am an item

2.2 Enumerate

1. I am an item
2. I am an item
3. I am an item
   (a) I am an item
   (b) I am an item
   (c) I am an item
      i. I am an item
      ii. I am an item
      iii. I am an item

3 Math

3.1 Abs and Norm

Commands `\abs` and `\norm`[1] produce the following:

command	**non-starred**	**starred**
`\abs`	$\left\lvert\frac{1}{2}x^2\right\rvert$	$\lvert\frac{1}{2}x^2\rvert$
`\norm`	$\left\lVert\frac{1}{2}x^2\right\rVert$	$\lVert\frac{1}{2}x^2\rVert$

The difference between *starred* and *non-starred* lies in the scaling of the bars.

[1] see https://tex.stackexchange.com/a/43009

3.2 Sets and Tupels

Command: `\mset` produces the following:

$$\{\, 1, 2, 3, 4 \,\}$$

$$\left\{\, a \;\middle|\; \frac{a}{2} > 5 \,\right\}$$

Command: `\msetempty` produces the following:

$$\{\}$$

Command: `\mtupel` produces the following:

$$\langle\, 1, 2, 3, 4 \,\rangle$$

Command: `\mtupelempty` produces the following:

$$\langle\rangle$$

3.3 Conditions

Environment: `\begin{conditions}` [2] can be used for the following:
Boltzmann distribution: state occupation probability of a thermodynamical system within fixed temperature T:

$$p(x) = \alpha \cdot e^{-\frac{E(x)}{k \cdot T}}$$

where:

x	... state
α	... degeneracy (= number of states x' with the same energy as x)
$E(x)$	... energy
k	... Bolzmann constant

It is possible to have different symbols instead of the dots.

4 Logic

4.1 Verum and Falsum

Command: `\ltrue` produces the following:

$$\top$$

Command: `\lfalse` produces the following:

$$\bot$$

5 lstlistings

5.1 Python

```
import numpy as np

def incmatrix(genl1,genl2):
    m = len(genl1)
    n = len(genl2)
    M = None #to become the incidence matrix
    VT = np.zeros((n*m,1), int)  #dummy variable

    #compute the bitwise xor matrix
    M1 = bitxormatrix(genl1)
    M2 = np.triu(bitxormatrix(genl2),1)

    for i in range(m-1):
        for j in range(i+1, m):
            [r,c] = np.where(M2 == M1[i,j])
```

[2] see https://tex.stackexchange.com/a/95842

```
            for k in range(len(r)):
                VT[(i)*n + r[k]] = 1;
                VT[(i)*n + c[k]] = 1;
                VT[(j)*n + r[k]] = 1;
                VT[(j)*n + c[k]] = 1;

                if M is None:
                    M = np.copy(VT)
                else:
                    M = np.concatenate((M, VT), 1)

                VT = np.zeros((n*m,1), int)

    return M
```

5.2 C++

```
#include <iostream>
using namespace std;

int main() {
    int n, t1 = 0, t2 = 1, nextTerm = 0;

    cout << "Enter the number of terms: ";
    cin >> n;

    cout << "Fibonacci Series: ";

    for (int i = 1; i <= n; ++i) {
        // Prints the first two terms.
        if(i == 1) {
            cout << t1 << ", ";
            continue;
        }
        if(i == 2) {
            cout << t2 << ", ";
            continue;
        }
        nextTerm = t1 + t2;
        t1 = t2;
        t2 = nextTerm;

        cout << nextTerm << ", ";
    }
    return 0;
}
```

5.3 Output

Output

```
Enter a positive integer: 100
Fibonacci Series: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89,
```

5.4 Pseudocode

```
function Tree-Search(problem) returns a solution, or failure
  initialize the frontier using the initial state of problem
  loop do
    if the frontier is empty then return failure
    choose a leaf node and remove it from the frontier
    if the node contains a goal state then return the corresponding solution
    expand the chosen node, adding the resulting nodes to the frontier
```

code.pseudo

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pseudo

This is a very very very very very very very very very very very very very very very very very very long title

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pseudo

6 Boxes

6.1 Infobox

Wichtig:

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6.1.1 Infobox in a minipage

This is the title

I am the left info box.

This is the title

I am the right info box.

6.2 Highlightbox

$$\boxed{1 + 2 = 3}$$