

Title

— *Author* —

1. Dezember 2022

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1 Introduction

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1.1 Subsection

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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
<code>\abs</code>	$ \frac{1}{2}x^2 $	$ \frac{1}{2}x^2 $
<code>\norm</code>	$\ \frac{1}{2}x^2\ $	$\ \frac{1}{2}x^2\ $

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

¹see <https://tex.stackexchange.com/a/43009>

3.2 Sets and Tupels

Command: `\mset` produces the following:

$$\{1, 2, 3, 4\}$$
$$\left\{ a \mid \frac{a}{2} > 5 \right\}$$

Command: `\msetempty` produces the following:

$$\{\}$$

Command: `\mtupel` produces the following:

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

Command: `\mtupeleempty` 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 ... Boltzmann constant

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

4 Logic

4.1 Verum and Falsum

Command: `\ltrue` produces the following:

⊤

Command: `\lfalse` produces the following:

⊥

5 lstlistings

5.1 Python

```
1 import numpy as np
2
3 def incmatrix(genl1, genl2):
4     m = len(genl1)
5     n = len(genl2)
6     M = None #to become the incidence matrix
7     VT = np.zeros((n*m, 1), int) #dummy variable
8
9     #compute the bitwise xor matrix
10    M1 = bitxormatrix(genl1)
11    M2 = np.triu(bitxormatrix(genl2), 1)
12
13    for i in range(m-1):
14        for j in range(i+1, m):
```

²see <https://tex.stackexchange.com/a/95842>

```
15         [r,c] = np.where(M2 == M1[i,j])
16         for k in range(len(r)):
17             VT[(i)*n + r[k]] = 1;
18             VT[(i)*n + c[k]] = 1;
19             VT[(j)*n + r[k]] = 1;
20             VT[(j)*n + c[k]] = 1;
21
22         if M is None:
23             M = np.copy(VT)
24         else:
25             M = np.concatenate((M, VT), 1)
26
27         VT = np.zeros((n*m,1), int)
28
29     return M
```

5.2 C++

```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     int n, t1 = 0, t2 = 1, nextTerm = 0;
6
7     cout << "Enter the number of terms: ";
8     cin >> n;
9
10    cout << "Fibonacci Series: ";
11
12    for (int i = 1; i <= n; ++i) {
13        // Prints the first two terms.
14        if(i == 1) {
15            cout << t1 << ", ";
16            continue;
17        }
18        if(i == 2) {
19            cout << t2 << ", ";
20            continue;
21        }
22        nextTerm = t1 + t2;
23        t1 = t2;
24        t2 = nextTerm;
25
26        cout << nextTerm << ", ";
27    }
28    return 0;
29 }
```

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

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

code.pseudo

```

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

```

pseudo

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

```

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11 loop do
12 if the frontier is empty then return failure
13 choose a leaf node and remove it from the frontier
14 if the node contains a goal state then return the corresponding solution
15 expand the chosen node, adding the resulting nodes to the frontier

```

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

$$1 + 2 = 3$$