INFO221v11
“Hei!”

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Universitetet i Bergen

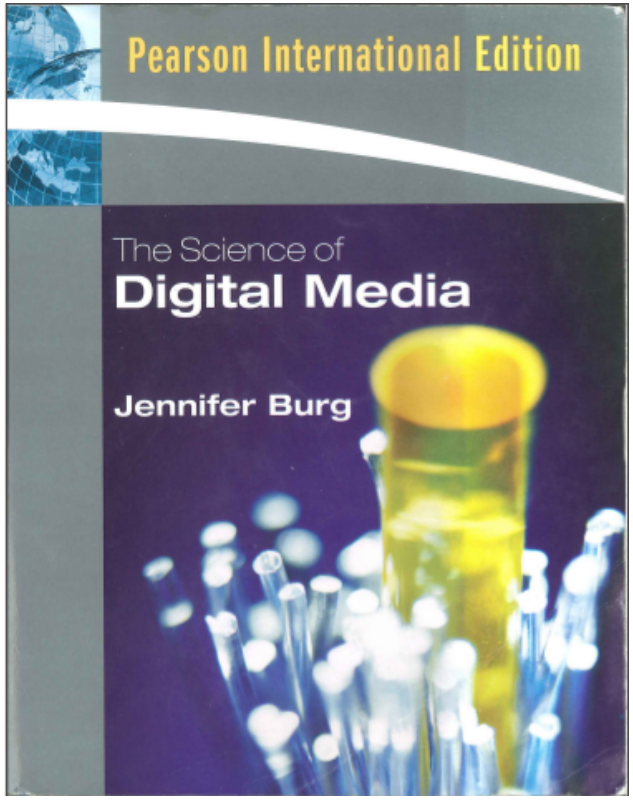
INFO221v12

Multimediabehandling vår 2012

Foreleser:	Truls Pedersen (tpe056@uib.no, rom 541)
Stud.ass:	Øyvind Døskeland (oyvind.doskeland@gmail.com)
	Snorre Davøen (sda087@student.uib.no)
Forelesning:	15 stk; onsdager kl. 10:15
	Bjørn Chr. hus, Rom 135 (01.02.12: 555)
Gruppe/lab:	U. Pihl (205 & 215)
Oblig. oppg:	Tre stk. (hhv. 15%, 15%, 30%)
Eksamen:	Skriftlig (40%)

Pensum

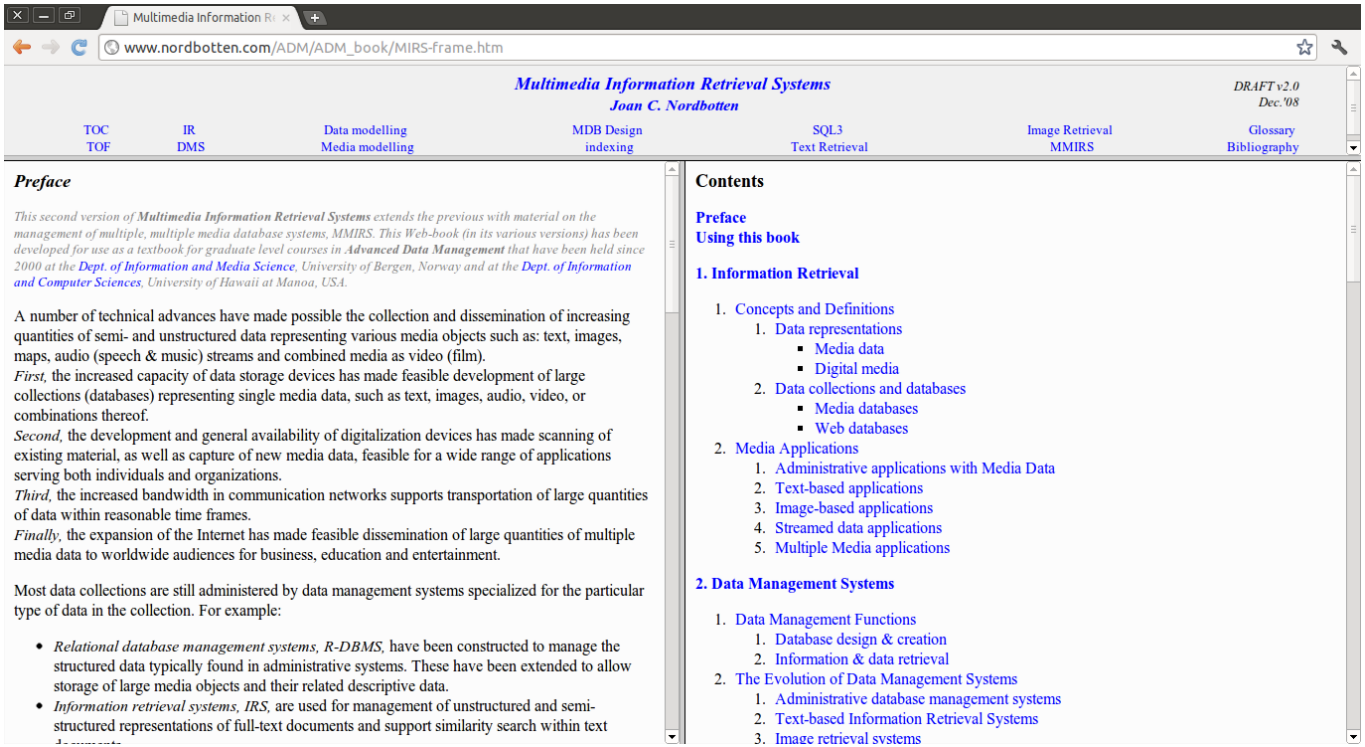
Multimedia



Hele* boken.

Pensum

Information Retrieval 1

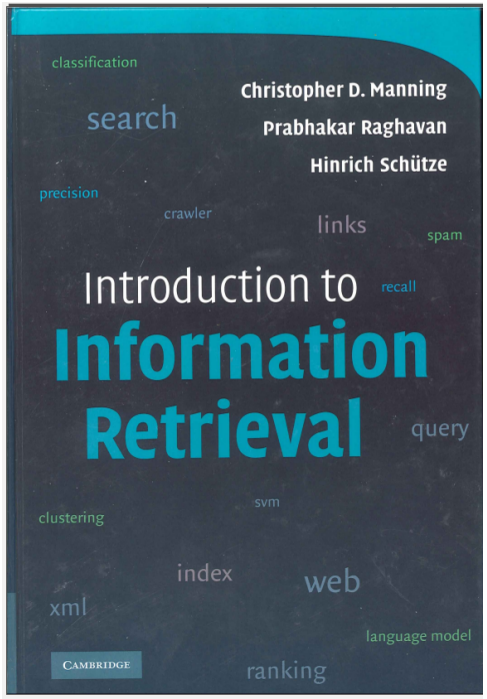


`www.nordbotten.com/ADM/ADM_book/MIRS-frame.htm`

Kapitler : 1 - 4, 6

Pensum

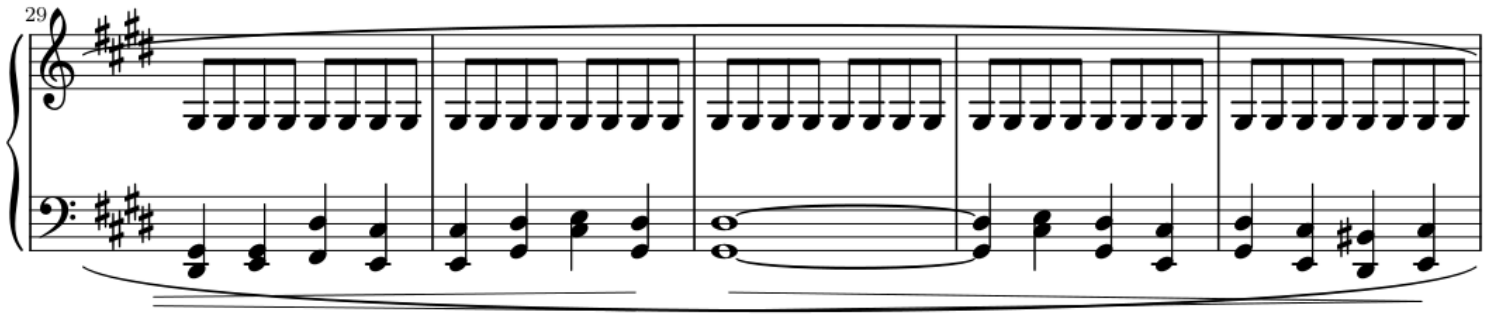
Information Retrieval 2



Kapitler: 1 - 4, 6 - 9

Multimediabehandling og gjenfinning

Motivasjon



...8A 2B 23 29 CA D9 83 23 0D 92 B9 FD 89...

Det er ikke lett å ha en vag idé om et stykke musikk og søke gjennom mp3 filer som “ligner”.

Hva kan vi fra før?

- programmere
- databaser
- enkel matematikk
  - og vektorer

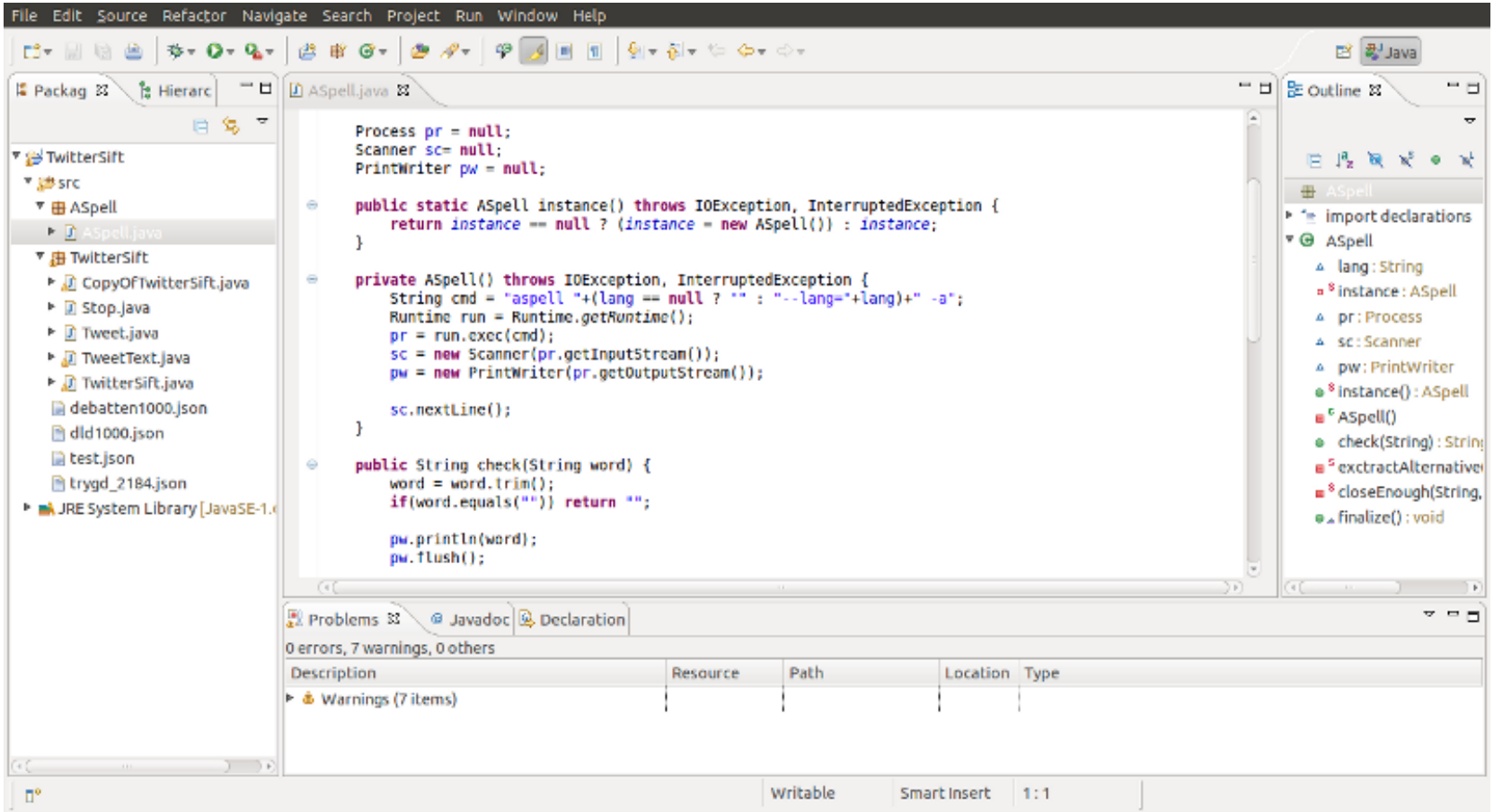
Programmering

```
public static void main(String[] args) {
    int w = 10, h = 6, n = w*h;

    for (int i = 0; i < n; i++) {
        out.print("("+i%w+","+i/w+(i%w==w-1?")\n":") "));
    }
}
```

Programmering

Programmering



Databaser

Databaser

```
> CREATE DATABASE tlf;
```

Databaser

```
> CREATE DATABASE tlf;
> USE tlf;
> CREATE TABLE liste (navn VARCHAR(255),
                      nummer INT,
                      PRIMARY KEY (navn,nummer));
```

Databaser

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> CREATE DATABASE tlf;
> USE tlf;
> CREATE TABLE liste (navn VARCHAR(255),
                      nummer INT,
                      PRIMARY KEY (navn,nummer));
> INSERT INTO liste (navn) VALUES ('Truls');
```

Databaser

```
> CREATE DATABASE tlf;
> USE tlf;
> CREATE TABLE liste (navn VARCHAR(255),
                      nummer INT,
                      PRIMARY KEY (navn,nummer));
> INSERT INTO liste (navn) VALUES ('Truls');
> INSERT INTO liste (navn) VALUES ('Truls');
```

Databaser

```
> CREATE DATABASE tlf;
> USE tlf;
> CREATE TABLE liste (navn VARCHAR(255),
                      nummer INT,
                      PRIMARY KEY (navn,nummer));
> INSERT INTO liste (navn) VALUES ('Truls');
> INSERT INTO liste (navn) VALUES ('Truls');
> INSERT INTO liste (navn,nummer)
                      VALUES ('Truls',55589124);
```

Databaser

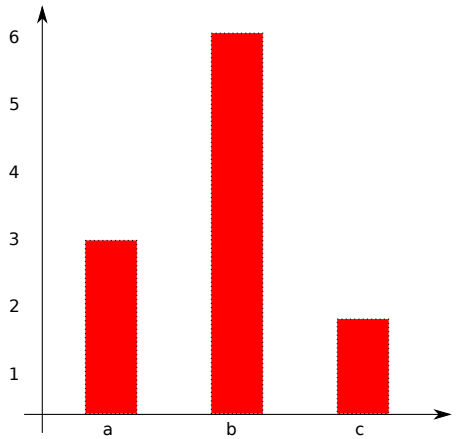
```
> CREATE DATABASE tlf;
> USE tlf;
> CREATE TABLE liste (navn VARCHAR(255),
                      nummer INT,
                      PRIMARY KEY (navn,nummer));
> INSERT INTO liste (navn) VALUES ('Truls');
> INSERT INTO liste (navn) VALUES ('Truls');
> INSERT INTO liste (navn,nummer)
                      VALUES ('Truls',55589124);
> CREATE INDEX hvemringer ON liste (nummer);
```

Databaser

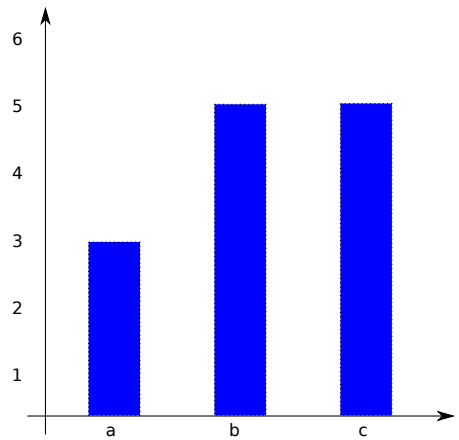
```
> CREATE DATABASE tlf;
> USE tlf;
> CREATE TABLE liste (navn VARCHAR(255),
                      nummer INT,
                      PRIMARY KEY (navn,nummer));
> INSERT INTO liste (navn) VALUES ('Truls');
> INSERT INTO liste (navn) VALUES ('Truls');
> INSERT INTO liste (navn,nummer)
                      VALUES ('Truls',55589124);
> CREATE INDEX hvemringer ON liste (nummer);
> SELECT (navn) FROM liste
                      WHERE nummer=55589124;
```

Matematikk

Vektorer



Lettøl



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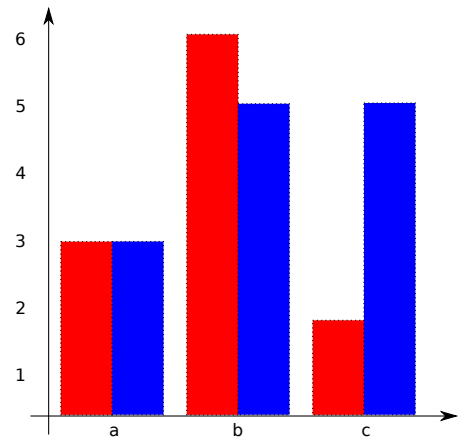
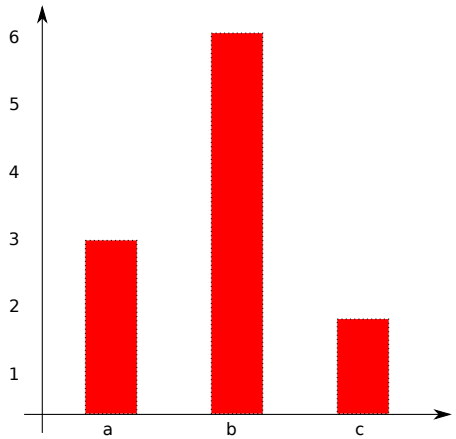
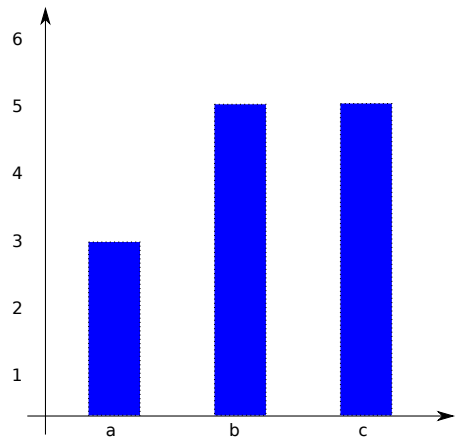


Matematikk

Vektorer



Lettøl



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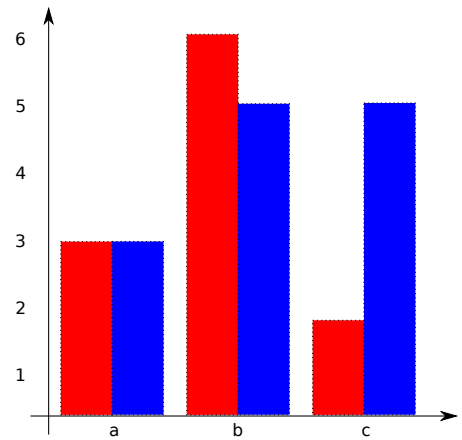
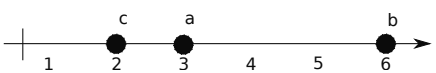
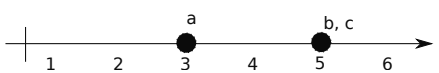
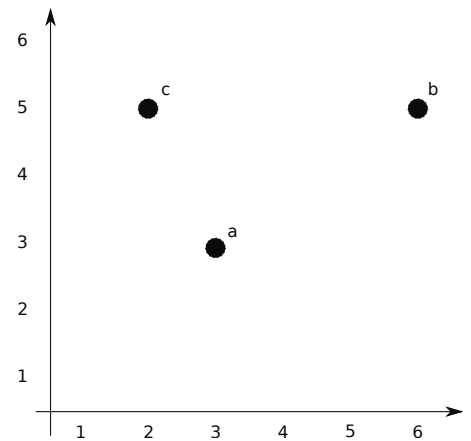


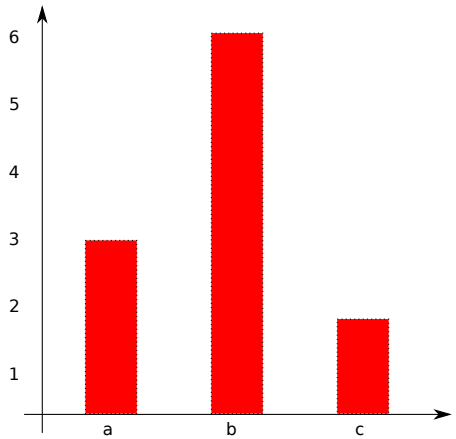




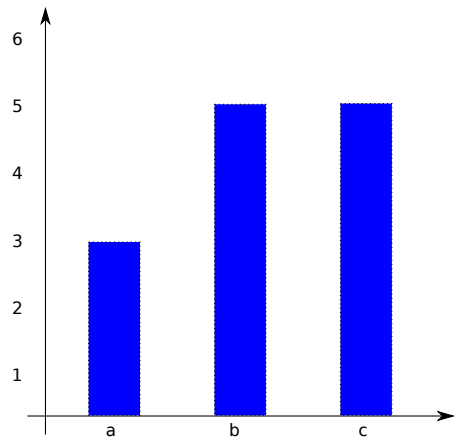


Matematikk

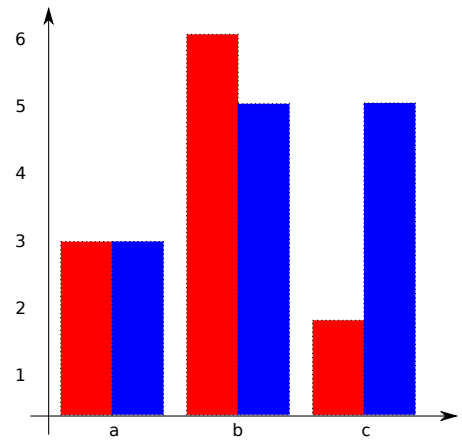
Vektorer

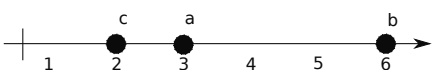


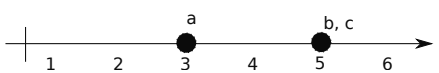
Lettøl

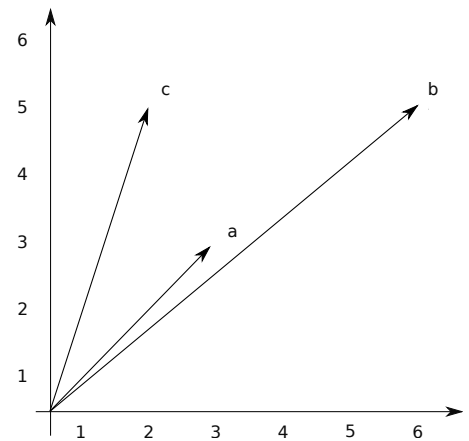


Is









Matematikk

Vektorer

$$\begin{aligned} \vec{a} &= (3,3) & |\vec{a}|^2 &= 3^2 + 3^2 \\ \vec{b} &= (6,5) & |\vec{b}|^2 &= 6^2 + 5^2 \\ \vec{c} &= (2,5) & |\vec{c}|^2 &= 2^2 + 5^2 \end{aligned}$$

Generelt:

$$\vec{v} = (x_1, x_2, \ldots, x_n)$$

$$|\vec{v}|^2 = x_1^2 + x_2^2 + \ldots + x_n^2$$

Matematikk

Vektorer

$$\vec{v} = (x_1, x_2, \ldots, x_n)$$

$$\begin{aligned} 2\vec{v} =& (2x_1, 2x_2, \ldots, 2x_n) \\ & (x_1 + x_1, x_2 + x_2, \ldots, x_n + x_n) = \vec{v} + \vec{v} \end{aligned}$$

Matematikk

Vektorer

$$\vec{v} = (x_1, x_2, \ldots, x_n)$$

$$\begin{aligned} 2\vec{v} =& (2x_1, 2x_2, \ldots, 2x_n) \\ & (x_1 + x_1, x_2 + x_2, \ldots, x_n + x_n) = \vec{v} + \vec{v} \\ \frac{\vec{v}}{3} =& (\frac{x_1}{3}, \frac{x_2}{3}, \ldots, \frac{x_n}{3}) \end{aligned}$$

Matematikk

Vektorer

$$\vec{v} = (x_1, x_2, \ldots, x_n)$$

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Normalisering:

$$\hat{v} = \frac{\vec{v}}{|\vec{v}|}$$

Matematikk

Vektorer - indreprodukt

Hvis $\vec{v} = (x_1, x_2, x_3)$ og $\vec{u} = (y_1, y_2, y_3)$, så er

$$\vec{v} \cdot \vec{u} = x_1 y_1 + x_2 y_2 + x_3 y_3$$

Matematikk

Vektorer - indreprodukt

Hvis $\vec{v} = (x_1, x_2, x_3)$ og $\vec{u} = (y_1, y_2, y_3)$, så er

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Og generelt, hvis $\vec{v} = (x_1, x_2, \ldots x_n)$ og $\vec{u} = (y_1, y_2, \ldots, y_n)$, så

$$\vec{v} \cdot \vec{u} = \sum_{i=1}^{n} x_i y_i$$

Matematikk

Vektorer - indreprodukt

Hvis $\vec{v} = (x_1, x_2, x_3)$ og $\vec{u} = (y_1, y_2, y_3)$, så er

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Og generelt, hvis $\vec{v} = (x_1, x_2, \ldots x_n)$ og $\vec{u} = (y_1, y_2, \ldots, y_n)$, så

$$\vec{v} \cdot \vec{u} = \sum_{i=1}^{n} x_i y_i$$

Greit å huske

$$\vec{v} \cdot \vec{v} = |\vec{v}|^2$$

Matematikk

$$\cos\Theta = \frac{\vec{v}\cdot\vec{w}}{|\vec{v}||\vec{w}|}$$