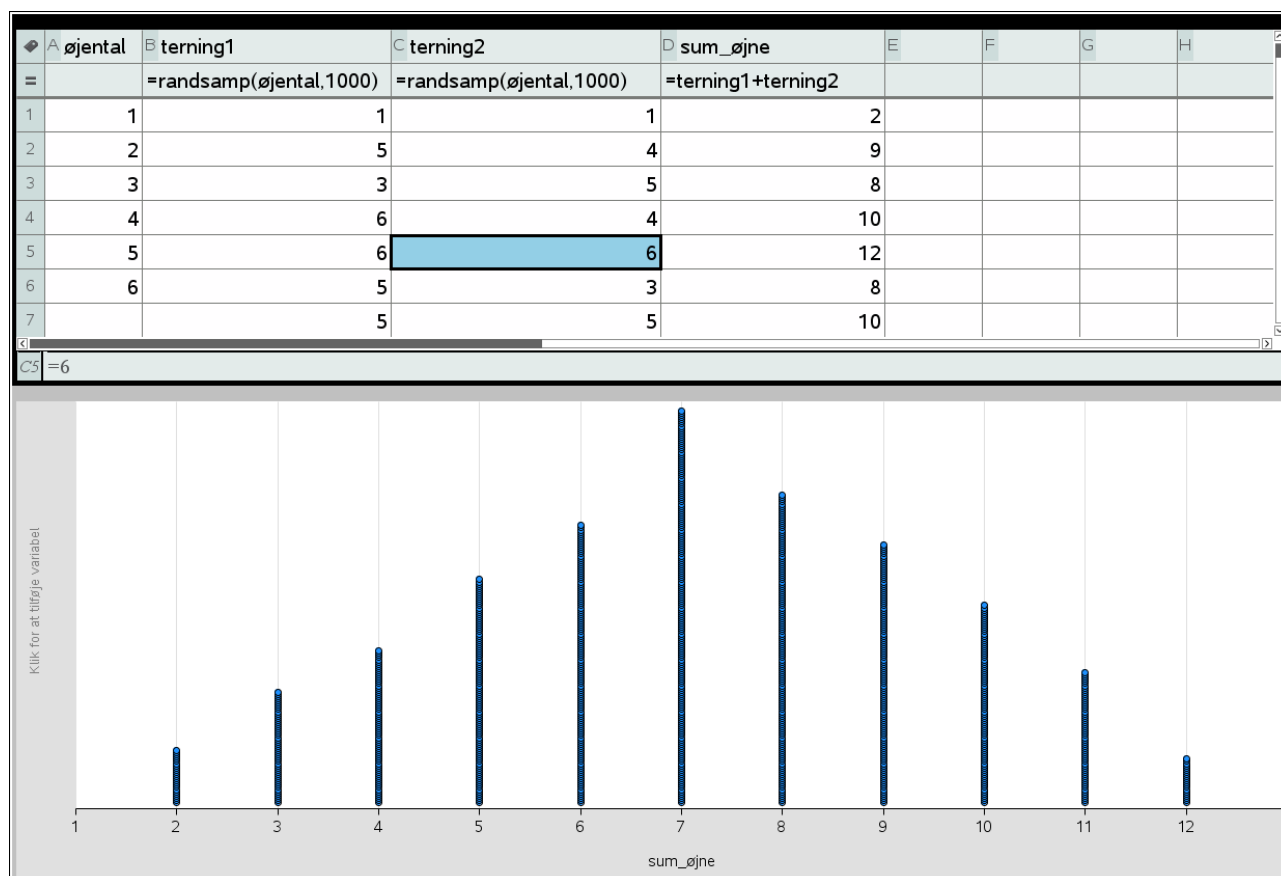


## Vejledning til at simulere terningkast mv. i Nspire, Maple og Geogebra

### TI-Nspire-CAS:

1. Opret en side med to kolonner eller to rækker – øverst: *Lister og regneark*, og nederst: *Diagrammer og statistik*.
2. I regnearket lader du nu den første kolonne være den liste, som svarer til de 6 forskellige terningekast. Navngiv kolonnen: **øjental**.
3. Næste kolonne skal være den første terning, **terning1**, og tredje kolonne den anden terning, **terning2**.
4. Du kan nu på tilfældig måde kaste terningerne det antal gange du ønsker – på en gang, fx 1000 kast – med kommandoen: **randsamp(øjental,1000)** .
5. Den næste kolonne kalder du **sum\_øjne**, og der udregner du nu summen af de to øjental, der vises samtidigt, med kommandoen: **sum(terning1+terning2)**.
6. Gå over i Diagrammer og statistik, og sæt variabelen sum\_øjne på førsteaksen, så får du et stolpediagram (pindediagram), der viser fordelingen af de 1000 kast.
7. Trykker du nu ctrl+r, så får du nye tusind terningekast med hver af de to terninger, og derfor også en genberegnet sum af øjentalene i hver af de 1000 dobbeltkast – og samtidigt opdateres stolpediagrammet.



## Maple:

- a) Start med at kaste to terninger.

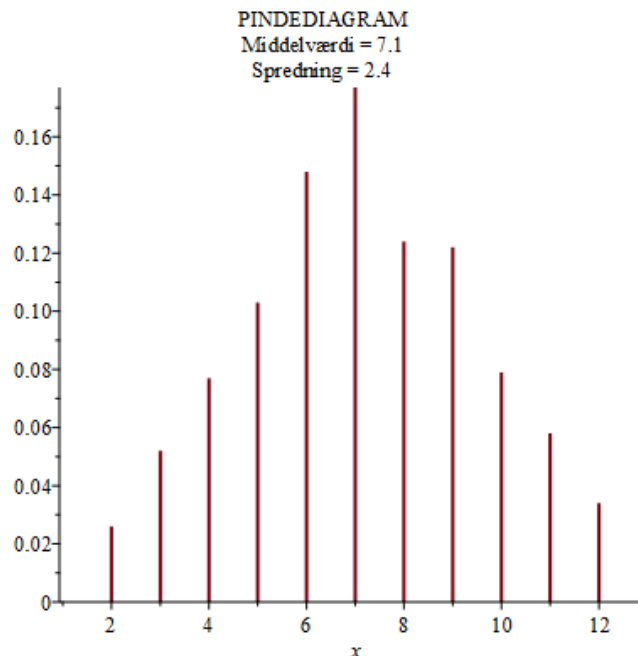
```
with(Gym) :
terning1 := rand(1..6) :
terning2 := rand(1..6) :
```

- b) Herefter kan vi lave en liste med 1000 kast af de to terninger, hvor vi tæller summen af de viste øjne.

```
with(Gym) :
terning1 := rand(1..6) :
terning2 := rand(1..6) :
liste := [seq(terning1() + terning2(), i = 1..1000)]
liste := [4, 8, 7, 6, 2, 9, 7, 8, 9, 8, 5, 9, 5, 7, 6, 7, 9, 8, 10, 4, 6, 9, 9, 6, 7, 7, 6, 9, 8, 11, 9, 8, 8, 7, 9, 9, 5, 11, 8, 7, 11, 3, 4, 5, 6, 6, 9, 11, 8, 8, 4, 11, 8, 4, 5, 4, 4, 6, 8, 6, 4, 3, 9, 8, 3, 6, 10, 6, 3, 9, 5, 7, 7, 3, 5, 4, 8, 12, 3, 7, 10, 10, 6, 6, 3, 6, 8, 8, 6, 5, 7, 8, 5, 11, 12, 7, 8, 12, 11, 8, 7, 6, 8, 6, 11, 9, 9, 8, 2, 7, 9, 9, 9, 6, 5, 5, 10, 4, 8, 8, 6, 8, 7, 9, 7, 6, 9, 10, 10, 7, 9, 8, 2, 5, 6, 10, 9, 6, 9, 3, 5, 12, 4, 11, 4, 4, 4, 7, 7, 5, 5, 7, 2, 6, 6, 3, 5, 6, 6, 7, 8, 4, 5, 7, 8, 6, 10, 6, 12, 8, 8, 6, 9, 9, 6, 4, 7, 10, 4, 10, 3, 8, 7, 6, 3, 11, 9, 5, 7, 7, 5, 7, 8, 5, 8, 12, 11, 10, 9, 4, 9, 7, 7, 4, 8, 4, 12, 6, 9, 5, 7, 8, 8, 2, 3, 8, 11, 11, 7, 8, 6, 10, 7, 4, 7, 5, 8, 9, 7, 7, 8, 9, 7, 7, 8, 3, 5, 7, 6, 5, 8, 5, 8, 11, 10, 6, 8, 2, 6, 11, 8, 6, 10, 3, 6, 6, 3, 7, 7, 6, 4, 7, 9, 11, 4, 8, 4, 6, 2, 5, 10, 7, 6, 10, 6, 6, 6, 3, 6, 9, 4, 4, 8, 9, 9, 4, 3, 7, 4, 11, 7, 5, 12, 2, 2, 3, 5, 11, 12, 5, 7, 12, 9, 6, 6, 11, 9, 6, 6, 4, 3, 6, 5, 9, 7, 10, 7, 4, 7, 6, 8, 7, 11, 7, 2, 7, 7, 8, 4, 6, 10, 12, 5, 4, 12, 4, 8, 8, 5, 8, 6, 11, 6, 6, 3, 6, 11, 8, 5, 9, 10, 3, 7, 9, 9, 8, 6, 3, 4, 8, 6, 9, 9, 7, 6, 9, 10, 7, 10, 8, 9, 11, 7, 6, 5, 12, 4, 4, 6, 7, 2, 10, 7, 11, 5, 8, 7, 7, 8, 6, 9, 9, 5, 9, 8, 4, 7, 5, 10, 6, 10, 4, 5, 6, 5, 6, 10, 7, 6, 4, 10, 10, 5, 3, 5, 8, 10, 7, 3, 7, 8, 7, 10, 12, 7, 7, 10, 10, 10, 7, 7, 10, 2, 8, 6, 6, 8, 8, 3, 3, 5, 11, 5, 6, 4, 10, 9, 8, 5, 7, 9, 10, 10, 8, 9, 7, 11, 2, 6, 3, 4, 3, 11, 8, 4, 8, 5, 6, 8, 8, 9, 10, 7, 8, 5, 9, 9, 11, 7, 9, 8, 9, 6, 7, 6, 7, 5, 9, 7, 7, 8, 8, 6, 8, 12, 10, 4, 7, 9, 7, 2, 7, 9, 6, 10, 10, 8, 8, 9, 6, 8, 4, 9, 5, 4, 7, 7, 10, 11, 10, 8, 12, 8, 10, 5, 8, 6, 9, 6, 9, 9, 10, 9, 8, 10, 7, 7, 10, 6, 5, 7, 5, 7, 8, 5, 7, 5, 2, 9, 7, 8, 5, 5, 7, 6, 8, 6, 5, 6, 11, 8, 8, 10, 5, 7, 11, 7, 5, 2, 9, 8, 9, 2, 9, 10, 6, 6, 6, 10, 6, 3, 9, 8, 11, 5, 5, 7, 10, 11, 4, 3, 10, 6, 6, 5, 6, 7, 8, 12, 6, 9, 9, 5, 5, 6, 12, 5, 7, 6, 6, 10, 9, 9, 11, 7, 12, 6, 10, 6, 6, 7, 11, 5, 12, 10, 10, 6, 7, 10, 8, 10, 10, 6, 9, 8, 11, 9, 11, 3, 8, 9, 11, 7, 5, 2, 8, 9, 8, 5, 6, 2, 11, 12, 10, 9, 10, 7, 8, 7, 11, 2, 9, 11, 6, 9, 8, 9, 4, 6, 5, 6, 9, 7, 5, 7, 10, 8, 7, 12, 6, 7, 10, 11, 5, 4, 11, 7, 11, 9, 9, 7, 5, 4, 7, 6, 7, 5, 7, 5, 7, 2, 7, 10, 9, 3, 6, 6, 11, 9, 3, 7, 3, 7, 3, 6, 5, 5, 7, 9, 7, 8, 8, 9, 6, 6, 7, 7, 5, 6, 5, 6, 12, 7, 12, 9, 4, 9, 9, 6, 10, 4, 4, 8, 7, 7, 10, 12, 6, 12, 7, 6, 9, 7, 9, 9, 6, 9, 3, 3, 2, 10, 8, 5, 8, 3, 6, 4, 9, 7, 5, 9, 5, 9, 4, 9, 7, 7, 11, 6, 5, 12, 7, 9, 9, 5, 7, 6, 6, 3, 5, 8, 7, 10, 7, 5, 6, 4, 7, 11, 6, 5, 10, 4, 7, 7, 4, 6, 6, 2, 7, 4, 4, 2, 7, 7, 2, 3, 4, 10, 6, 4, 3, 9, 7, 10, 7, 7, 5, 10, 8, 9, 7, 9, 4, 11, 3, 5, 7, 3, 8, 12, 6, 11, 9, 11, 6, 7, 12, 7, 10, 4, 8, 4, 6, 5, 7, 9, 8, 7, 9, 9, 7, 3, 7, 5, 6, 7, 7, 6, 9, 5, 7, 9, 8, 2, 10, 7, 11, 12, 7, 3, 6, 9, 4, 5, 5, 6, 7, 6, 7, 10, 5, 11, 11, 6, 7, 7, 7, 9, 4, 5, 4, 5, 5, 11, 6, 6, 7, 6, 11, 6, 6, 9, 5, 3, 5, 5, 7, 4, 4, 8, 12, 7, 6, 6, 8, 7, 7, 8, 7, 6, 7, 4, 3, 8, 7, 8, 9, 6, 6, 6, 7, 8, 8, 5, 6, 3, 11, 7, 10, 10, 8, 5, 3, 8, 10, 6, 5, 9, 8, 9, 4, 7, 4, 9, 7, 6, 9, 7, 12, 9, 3, 11, 12, 4, 12, 8, 7, 11, 8, 4, 4, 8, 3, 10, 7, 7, 3, 5, 4, 9, 7, 8, 4]
```

- c) Vi kan tegne et pindediagram.

```
plotPindediagram(liste)
```



- d) Hvis vi genberegner dokumentet, så får vi en ny stikprøve.

## Geogebra:

- a) Start med at skrive =TilfældigMellem(1,6)+TilfældigMellem(1,6) i regnearket.

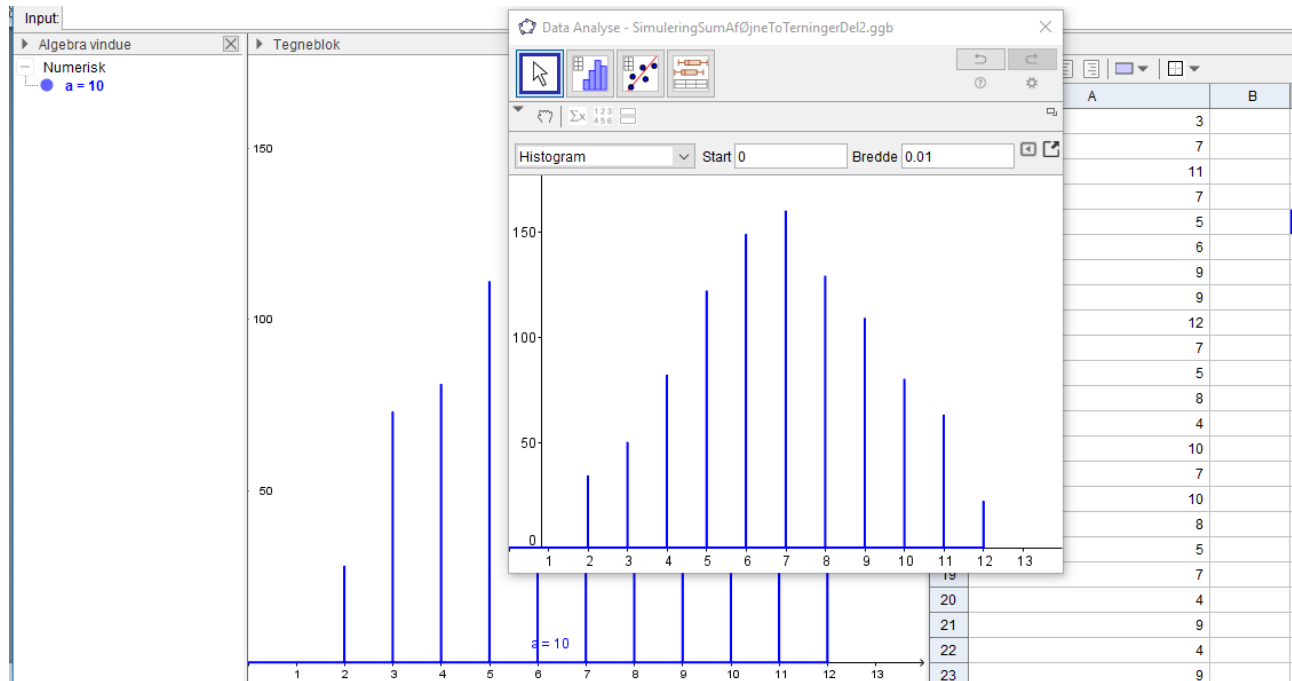
- b) Vi kan nu trække i cellemarkering og få en 1000 tilfældige kast.

▼ Regneark

|    | A  |
|----|----|
| 1  | 8  |
| 2  | 8  |
| 3  | 10 |
| 4  | 10 |
| 5  | 9  |
| 6  | 7  |
| 7  | 5  |
| 8  | 3  |
| 9  | 11 |
| 10 | 10 |
| 11 | 12 |
| 12 | 4  |
| 13 | 5  |
| 14 | 8  |
| 15 | 9  |
| 16 | 5  |
| 17 | 6  |
| 18 | 8  |
| 19 | 7  |
| 20 | 4  |
| 21 | 3  |
| 22 | 9  |
| 23 | 5  |

- c) Vi kan nu lave et pindediagram over fordelingen.

website: link fra kapitel 9, Sandsynlighedsregning og statistik, afsnit 2



d) Hvis vi genberegner regnearket med CTRL R, så får vi en ny fordeling.