Kursus 02100 — Ugeseddel-Uge-02-Formiddag

Opgave 1

Løs nedenstående opgave.

In physics, a common useful equation for finding the position s of a body in linear motion at a given time t, based on its initial position s_0, initial velocity v_0, and rate of acceleration a, is the following:

$$s = s_0 + v_0 t + \frac{1}{2} a t^2$$

Write code to declare variables for s_0, v_0, a, and t, and then write the code to compute s based on these values.

Opgave 2

Løs nedenstående opgave.

Write a `for` loop that produces the following output:

```
1 4 9 16 25 36 49 64 81 100
```

For added challenge, try to modify your code so that it does not need to use the * multiplication operator.

Hint: Look at the differences between adjacent numbers.

Opgave 3

Løs nedenstående opgaver.

a) Write nested `for` loops that produce the following output.

```
0001112223334445556667778889999
0001112223334445556667778889999
0001112223334445556667778889999
```

b) Modify the code so that it now produces the following output.

```
99999888887777766666555554444433333222221111100000
99999888887777766666555554444433333222221111100000
99999888887777766666555554444433333222221111100000
99999888887777766666555554444433333222221111100000
99999888887777766666555554444433333222221111100000
```

c) Modify the code so that it now produces the following output.

```
99999999988888888777777766666655555444433321
99999999988888888777777766666655555444433321
99999999988888888777777766666655555444433321
99999999988888888777777766666655555444433321
```

Opgave 4

Løs nedenstående opgave.

The Fibonacci numbers are a sequence of integers in which the first two elements are 1, and each following element is the sum of the two preceding elements. The mathematical definition of each kth Fibonacci number is the following:

$$F(k) = \begin{cases} F(k-1) + F(k-2) & \text{if } k > 2 \\ 1 & \text{if } k \leq 2 \end{cases}$$

The first 12 Fibonacci numbers are:

```
1 1 2 3 5 8 13 21 34 55 89 144
```

Write a `for` loop that computes and prints the first 12 Fibonacci numbers.

Opgave 5

Løs nedenstående opgave.

Write a method called printDesign that produces the following output. Use `for` loops to capture the structure of the figure.

```
-----1-----
----333----
---55555---
--7777777--
-999999999-
```

Opgave 6

Løs nedenstående opgave.

Write a program that produces the following output. Use a class constant to make it possible to change the number of stairs in the figure.