UNIVERSITY OF COPENHAGEN

Ninth exercise class

Class 5

Introduction to numerical programming and analysis

Asker Nygaard Christensen

Spring 2021

Plan

1. Problem Set 5, P.2-P.4
2. P.5 and P.6, intuition
3. Self work 15:40-16:45
4. Going through P.5 and P.6 together
5. Recap

Problem Set 5, P.2-P.4

PS 5

I don't have to many direct notes for problem set 5, P.2-P.4, since there are many references already. I have uploaded my version of the answers if you're interested in alternative solutions. There is also an faster implementation of the sieve of Eratosthenes in the last problem (which you'll need if you have a crack at project Euler).

P.2-P.4

P.2 **Factorical**. If recursion is messing with your mind you can watch this video, which is explains it quit nicely, using the factorial as an example.
They also made this video, with a slightly more complicated example.

P.3 **Bubble sort**. As noted, you can use the *bubble_sort()* from the lectures, the change you have to make, is to make the function sort in descending order instead of ascending.

P.4 **Linear search**. As noted, take inspiration from *linear_search()* from the lectures. And notice that this time you are not looking for an exact match

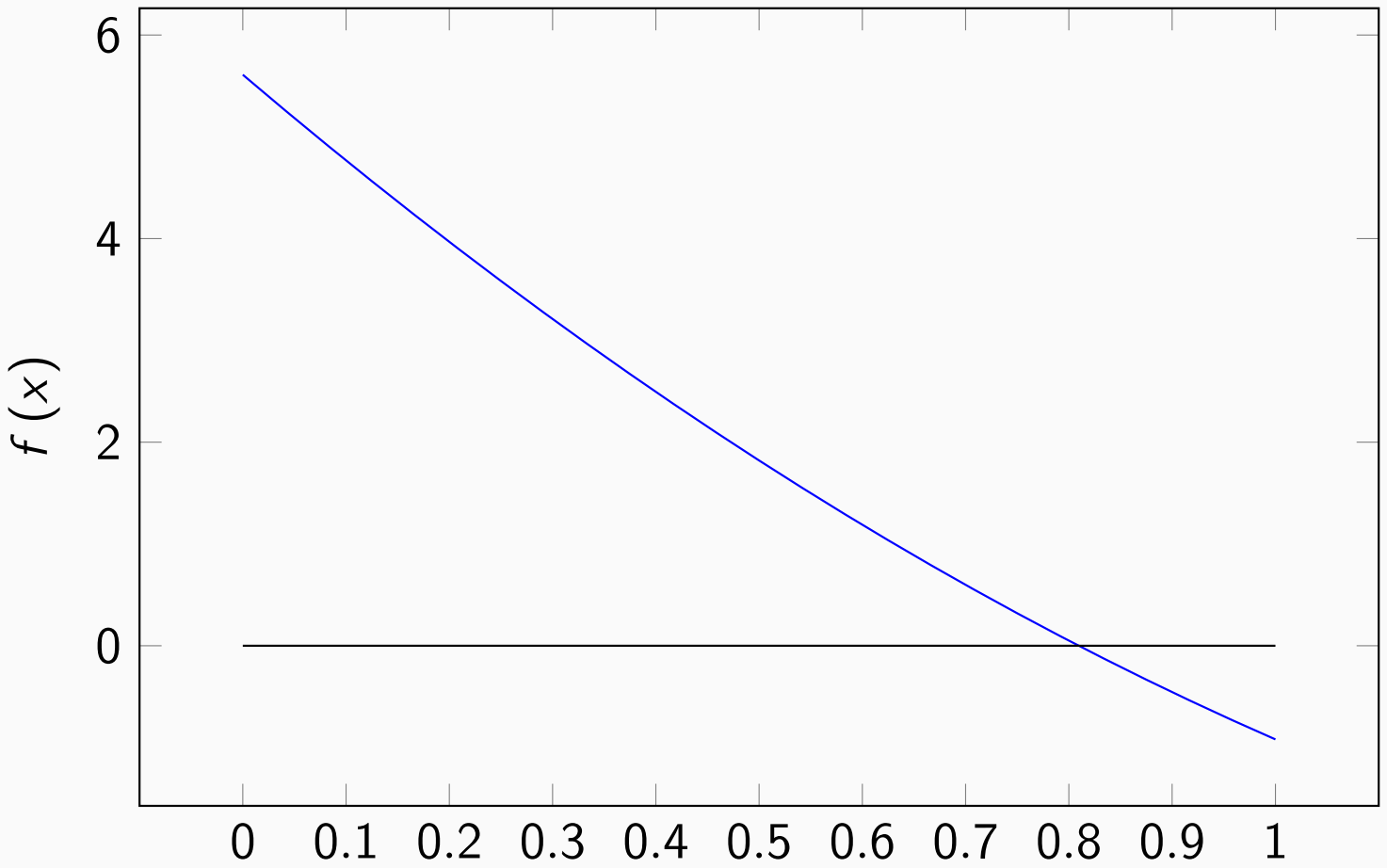
P.5 and P.6, intuition

P.5-P.6

For **Bisection** and **Finding prime numbers** there is no corresponding functions in the lectures. So these are a bit harder. There are, however, algorithmic 'cooking recipes' to use a guide.
I'll try to explain the intuition now, and then we'll go through the answer at the end of class.

P.5, intuition

$$f(x) = (2.1 \cdot x - 1.7) \cdot (x - 3.3)\,\frac{1}{x^2}$$



P.6, intuition

Definition of prime: A prime number is a natural number, greater than 1 that is not a product of two smaller natural numbers.

	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Self work 15:40-16:45

Going through P.5 and P.6 together

Recap

Euler

You're very welcome to ask my questions about Euler problems also.
ALSO: Remember to do your peer feedback, they're a requirement for the exam!