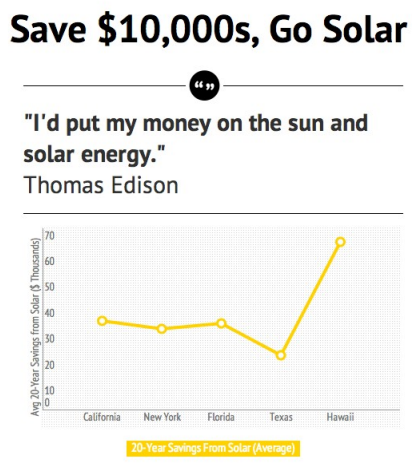


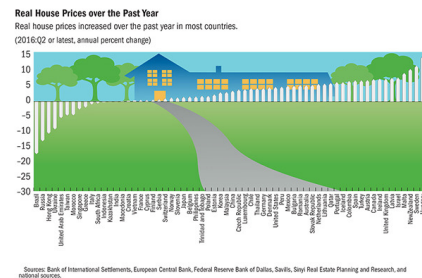
Scientific Visualization (Assignment 1)

Exercise 1.1 Visualization Examples [3 Points]

Please evaluate the appropriateness of the diagrams in figure 1a and 1b
(source: <http://viz.wtf/archive>):



(a) Line chart.



(b) Bar chart.

Figure 1: Diagrams

Exercise 1.2 Matplotlib: Functions [3 Points]

Generate an expressive visualization of the following function using Matplotlib: ¹

$$f(x, y) = \frac{1 + \cos 12\sqrt{x^2 + y^2}}{0.5(x^2 + y^2) + 2}$$

Upload your Python script and an image of your solution. A possible solution may look like the figure 2, but you are encouraged to come up with your own alternative visualization. Make sure that: you draw the function correctly, you label axes and you draw a color bar.

¹You can download Matplotlib from here: <https://matplotlib.org/users/installing.html>, you can find a PyPlot tutorial here: https://matplotlib.org/users/pyplot_tutorial.html, there is an overview of plots with source codes: <https://matplotlib.org/gallery.html>, and you can find the colour map reference here: https://matplotlib.org/examples/color/colormaps_reference.html

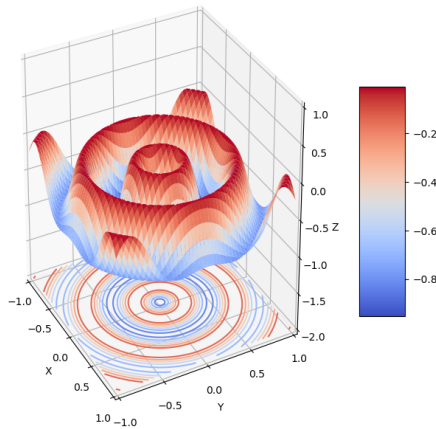


Figure 2: Plot of function $f(x, y)$ on the interval $[0, 1]^2$.

Exercise 1.3 Matplotlib: Data Input [2 Points]

View the data set in the file `data` (provided through ILIAS), that is by opening the file in an editor or by using the UNIX command `more`. Try to localize the maximum. Then use `Matplotlib` to find the position $((x, y)$ -coordinates) of the maximum in the data set visually. Save a representative plot as a postscript or image file and include the coordinates of the maximum as an annotation. Upload your python script, the plot file and the coordinates of the maximum to ILIAS.

Remarks on handing in solutions:

Every team is supposed to hand in only one archive file containing the solution in the form:

`assignment_[01][0-9]_${lastname1}(_${lastname2})?(_${lastname3})?.(zip|tar|tar.gz)`

Example for this assignment: `assignment_01_frey_ertl.zip`

Submission Deadline: 01.05.2020, 23:55

please hand in your submission through the ILIAS system.