



Technische Universität Berlin
Faculty VII (Economics and Management)
Workgroup for Infrastructure Policy (WIP)

Operations Research – Coding Lab

Homework 1

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Approximately 15.000 tons of radioactive waste from spent fuels of nuclear power plants have accumulated in Germany until 2016. Assume that only 1% of this nuclear waste is Plutonium-239.

Exercise 1 - Variables

- Calculate the amount of PU-239 from the radioactive waste that has accumulated until 2016 and store it as a variable
- Convert the variable type to a Float64
- Create a variable of type String that shortly explains this number
- Print out both variables in the console using the the dollar function

The given template contains an array with nuclear power plants (NPP) that were shut down in 2021 (npp2021), an array with currently active nuclear power plants (npp2022) and one array with the power output of each plant (power2021, power2022).

Exercise 2 - Arrays

- Use an adequate function to add the the vectors with the names to one large vector called “allNPP”
- Add a fantasy plant to the end of the vector
- Print out the length of this vector
- Use an adequate function to horizontally combine “power2021” and “power2022” to a matrix. It should have 3 rows and 2 columns. Store it as “allPower”
- Find the maximum power output within this matrix using an adequate function
- Print out the name of the largest NPP together with its power output. Use the dollar function to directly access the value from the matrix

Exercise 3 - Dictionaries and Tuples

- Create a named tuple for each power plant that were shut down in 2021 (stored in “npp2021”) with the name of the power plant and its power (stored in “power2021”). Create the tuple from the arrays using an index.
- Create a dictionary that contains the name of the plant as a key and the power as value from “npp2022” and “power2022”