NESTED LOOPS
Second test

• On November 18, 2019, during the practice session
• Covers topics from Weeks 7 to 11
• First part is small quiz consisting of questions similar to those in weekly quizzes
• Second part consists of programming tasks similar to those in homeworks and practice sessions
• Materials are not allowed in the first part but are allowed in the second part
• Programming tasks must be solved in Thonny
Retake of the second test

• Format is the same as in the main test
• Best attempt counts
• Date not fixed yet, preferably in one or two weeks
Nested loops

for variable1 in list1:
    statements1
    for variable2 in list2:
        statements2
        statements3

for i in [1, 2, 3]:
    for j in [4, 5, 6]:
        print(i*j)
    print()
Nested lists

• Nested list is a list of lists:
  \[ m = \begin{bmatrix} [1, 2, 3], & [4, 5, 6], & [7, 8, 9] \end{bmatrix} \]

• Getting the row:
  >>> m[1]
  [4, 5, 6]

• Getting the element:
  >>> m[1][2]
  6
Data structures

• Primitive types: values cannot be decomposed into smaller units. For example: int, float, bool.

• Non-primitive types (data structures): contain other values in a structured way. For example: list, str.

• Possibilities to construct new data structures are endless. For example: list of lists of lists etc.
Other common data structures

• Tuple. Like an array but nonmutable.
  \[ t = (6, -2, 3) \]

• Set. Collection of unique elements where order is unimportant.
  \[ s = \{2, 4, 6\} \]

• Dictionary. Set of key-value pairs.
  \[ d = \{ 'day': 25, 'month': 4, 'year': 2019 \} \]
Algorithms and data structures

• Data structures represent „passive part“ of programming. They describe how data are organized.

• Algorithms represent „active part“ of programming. They describe what needs to be done with the data.

• Good program has both parts implemented in an efficient way.