TUPLES, SETS
Additional retake of the first test

May 23, 16:15
Tuples

Tuple is an immutable list.

\[
tuple = (element1, element2, element3, \ldots)
\]

\[
point = (2, -3)
\]

\[
point3d = (-2, 1, 3)
\]

\[
person = ("Eve", "Truu", 1996, "Tartu")
\]
Operations with tuples

- Accessing elements
  ```python
tuple[index]
t = ("red", "green", "blue")
print(t[2])
```

- Checking existence
  ```python
if element in tuple:
  ...
if "green" in t:
  print("yes")
else:
  print("no")
```
Looping through a tuple

• Loop over indices
  ```python
  for i in range(len(tuple)):
    ...
  ```

• Loop over elements
  ```python
  for el in tuple:
    ...
  ```

  ```python
  for i in range(len(t)):
    print(t[i])
  ```

  ```python
  for el in t:
    print(el)
  ```
Multiple return values

```python
def funcname(args):
    statements
    statements
    return (var1, var2)

def findmin(a):
    val = 1000
    for i in range(len(a)):
        if a[i] < val:
            val = a[i]
            ind = i
    return (val, ind)
```

Immutability

Immutable means that its value cannot be changed.

Tuple is immutable:
• Values of individual elements cannot be changed.
• Elements cannot be added or removed.
• Once created, the tuple remains as it is until the end of the program.
Sets

Set is an unordered collection of elements.

```python
set = {
    element1,
    element2,
    element3,
    ...
}
towns = {
    "Tallinn",
    "Tartu",
    "Narva",
    "Pärnu",
    "Viljandi"
}
```

Empty set is created with `set()`
Adding and removing elements

```
set.add(element)  
towns.add("Rakvere")
```

```
set.remove(element)  
towns.remove("Pärnu")
```
Checking the elements in a set

```python
if element in set:
    ...

for element in set:
    ...

len(set)
```

```python
if "Tapa" in towns:
    print("yes, found")

for t in towns:
    print(t)

print(len(towns))
```
Set operations

A & B          Intersection of sets A and B
A | B          Union of sets A and B
A - B          Difference of sets A and B
A ^ B          Symmetric difference of sets A and B
A <= B         A is subset of B
A >= B         A is superset of B