AuD Übung 02

PDF

3 ADT Pair

1.

Copy

```
type Pair =
  sorts:
          T1, T2, Pair

  functions:
    create: T1 x T2 -> Pair
    getFirst: Pair -> T1
    getSecond: Pair -> T2
    setFirst: Pair x T1 -> Pair
    setSecond: Pair x T2 -> Pair
end.
```

2.

```python
class Pair:
    def __init__(self, first, second):
        self.first = first
        self.second = second

    def get_first(self):
        return self.first

    def get_second(self):
        return self.second

    def set_first(self, value):
        self.first = value
        return self

    def set_second(self, value):
        self.second = value
        return self
```

3.

```
class Pair:
    def __init__(self, first, second):
        self.first = first
        self.second = second

    def get_first(self):
        return self.first

    def get_second(self):
        return self.second

    def set_first(self, value):
        self.first = value
        return self

    def set_second(self, value):
        self.second = value
        return self

        def empty():
                return Pair(null, null)


class Sequence:
    def __init__(self):
        self.sequence = Pair.empty()

    def insert(self, x, p):
                if p == 0:
                        return Pair(x, self.sequence)
                return Pair(self.sequence.get_first(), 
self.insert(self.sequence.get_second(), x, p-1))


    def delete(self, p):
        # Delete the element at position 'p', adjusting the index because 
lists are 0-indexed.
        if 0 <= p - 1 < len(self.sequence):
            del self.sequence[p - 1]
        else:
            raise IndexError('Position out of bounds')


# Demonstration of usage
seq = Sequence()
seq.insert(Pair('a', 1), 1)  # Here we are using a Pair as an element for 
the sequence.
```

```
seq.insert(Pair('b', 2), 2)
seq.delete(1)  # Deletes the first element ('a', 1).
```

4 ADT Menge

1.

```
type Menge =
        sorts:
                T, bool, menge

        functions:
                empty: -> menge
                isEmpty: menge -> bool
                contains: T x menge -> bool
                add: T x menge -> menge
                remove: T x menge -> menge
end.
```

2.

```
T: I(T) Datentyp des Grundtypen
   I(bool) = {true, false}
   I(menge) = P(I(T)) # Potenzmenge
            = \{\{x \in I(T) \mid \text{es gilt } H(x)} \text{ Für eine Bedingung H \}\} \cup \{\emptyset\}
```

Zusatzaufgabe

2.

```python
def getFirstR(xs):
        if xs[0] == ():
                return xs[1]
        return getFirstR(xs[0])
```

3.