Intelligent Learning and Analysis Systems SS19, Exercise Sheet 1

Andreas Hene, Niklas Mertens, Richard Palme

April 13, 2019

1. Finding Two Missing Items

2. Identifying the Majority

Let $\sigma = \langle a_1, \ldots, a_m \rangle, a_i \in [n]$.

Algorithm 1 Algorithm for finding the majority of σ, if it exists

```
 1: c ← 0
 2: for all i ∈ [m] do
 3:     if c = 0 then
 4:         s ← a_i
 5:         c ← 1
 6:     end if
 7:     if s = a_i then
 8:         c += 1
 9:     else
10:         c -= 1
11:     end if
12: end for
13: return s
```
---

3. Reservoir Sampling I.

4. Reservoir Sampling II.

5. The ϕ-HH Problem: Lower Bounds