**Problem 1**

1. **Aggregate method**

Ci = cost of i th operation

We have: **Ci = (if i is an exact power of 2) ? i : 1;**

|  |  |
| --- | --- |
| **i th operation** | **Cost** |
| 1 | 1 |
| 2 | 2 |
| 3 | 1 |
| 4 | 4 |
| 5 | 1 |
| 6 | 1 |
| 7 | 1 |
| 8 | 8 |
| … | … |
| … | … |
| n |  |

Average cost of operation = Total cost / n < 3

By aggregate analysis, the amortized cost per operation is O(1)

**Problem 2**

Please refer to **Prob2\_BubbleSort1.java** file

**Problem 3**

Please refer to **Prob4\_BubbleSort2.java** file

**Problem 4**

Please refer to **Prob4\_MySort.java** file

**Proof**

Just one FOR loop so it is O(n)