

Discrete Math for Computing II

Diego R.R.

January 12, 2024

Chapter 1

Algorithms Ch

1.1 Algorithms

1.1.1 Problem Section (book)

Exercise 1. 49

Exercise 2. 51

```
function BINARY_INSERTION_SORT( $(a_1, a_2, \dots, a_n)$ : list of numbers)
   $left := 1$ 
   $right := n$ 
  while  $left_{idx} < right_{idx}$  do
     $mid := \lfloor \frac{left+right}{2} \rfloor$ 
    if  $a_{mid} < a_{mid+1}$  then
       $left_{idx} := mid$ 
    else
       $right_{idx} := mid_{idx}$ 
   $insert_{idx} := left_{idx}$ 
   $insert_{val} := a_{insert_{idx}}$ 
   $idx := insert_{idx} - 1$ 
  while  $idx \geq 1$  and  $a_{idx} > insert_{val}$  do
     $a_{idx+1} := a_{idx}$ 
     $idx := idx - 1$ 
   $a_{idx+1} := insert_{val}$ 
  return  $(a_1, a_2, \dots, a_n)$ 
```