Last name	
First name	

Grade

S1# – Algorithmics
Midterm Exam #1 (C1)
23 avril 2019
Answer sheets

***Answers 1** (**Abstract types: Vector (errors and extension)** − **6 points**)*

1. Nature, description and solution of each of the two problems

nature	explanation	solution

2. Extension of the type *vector*:

   (a) Potential precondition

   _____

   (b) Axioms of the *reinitialize* operation

   _____

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Answers 2 (**Insertion Sort** – *7 points*)

1. **Specifications:**
   The function `insert` *x list comp* adds the element x in its place in the list *list* sorted according to the function *comp*.

   Caml function:

2. **Specifications:**
   The function `insertion_sort` *comp list* sorts the list *list* in order according to the function *comp*.
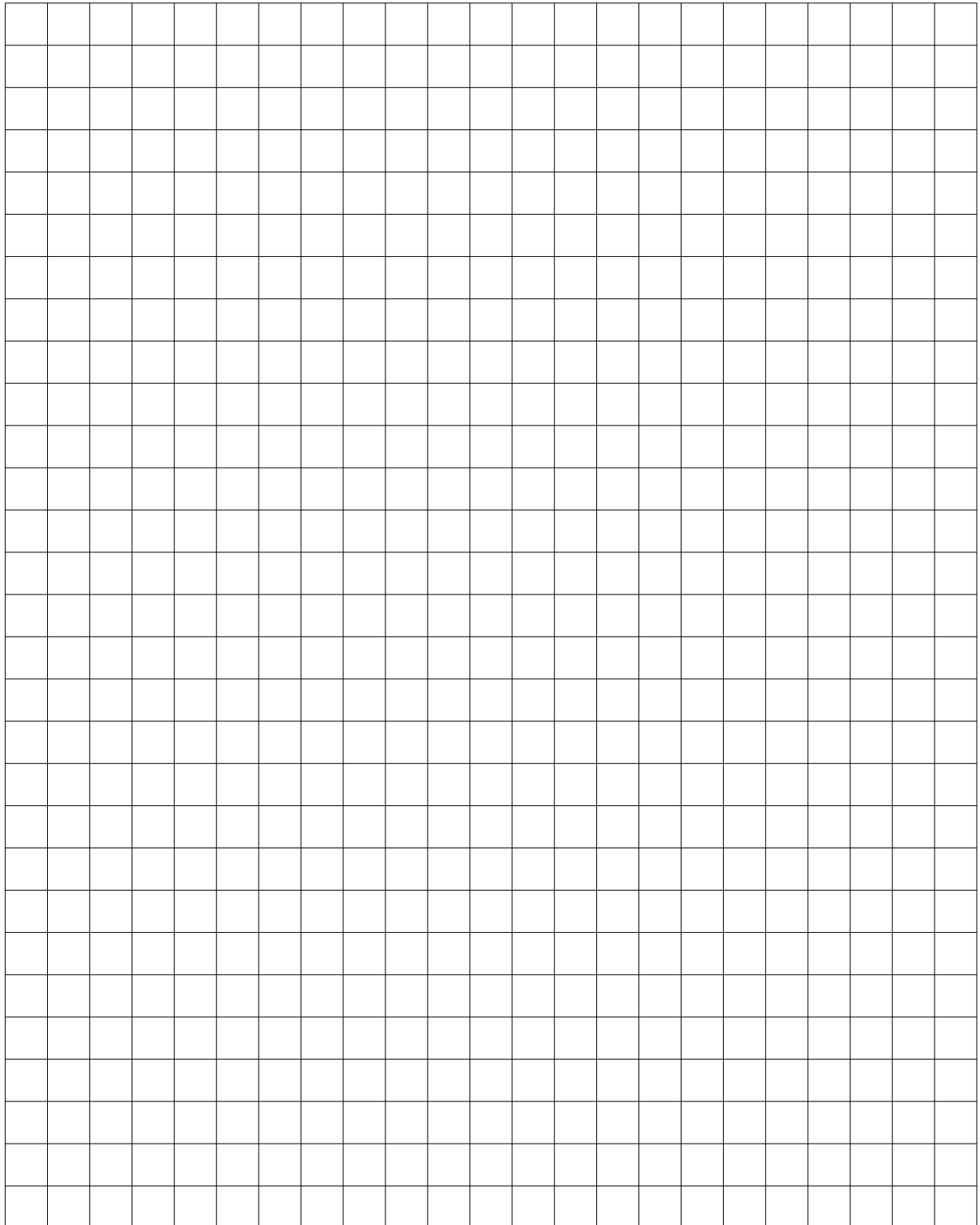
   Caml function:

Answers 3 **(Association – *5 points*)**

Specifications:

La fonction `assoc k list`, avec `list` une liste de couples (key:int, valeur:'a) triée par clés croissantes

Fonction CAML :

Answers 4 **(Mystery − *2 points*)**

1. Evaluations :

```
♯ let mystery = function
        [] -> failwith "..."
      | e::f::l -> (let rec aux_mystery m1 m2 = function
                        [] -> m2
                      | e::l -> if e < m1 then aux_mystery e m1 l
                                else if e < m2 then aux_mystery m1 e l
                                else aux_mystery m1 m2 l
                    in if e < f then aux_mystery e f l else aux_mystery f e l);;
```

_____

```
♯ mystery [1; 3; 4; 2];;
```

_____

```
♯ mystery [3.5; 8.2; 9.5; 4.0];;
```

_____

```
♯ mystery ['a'];;
```

_____

2. What is mystery ?

_____

_____

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