Last name	
First name	
Group	

Grade	

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Algorithmics
Undergraduate 1st year S1
Final Exam #1 (P1)
8 Jan. 2019 - 10 : 00
Answer Sheets

Answers 1 **(Binary Search: search "path" –** ***2 points*****)**

Valid search sequences?

- 50 - 15 - 48 - 22 - 46 - 42 YES – NO
- 48 - 15 - 45 - 22 - 47 - 42 YES – NO
- 15 - 22 - 45 - 43 - 35 - 42 YES – NO
- 22 - 45 - 43 - 15 - 35 - 42 YES – NO

Answers 2 **(Searching algorithms –** ***3 points*****)**

1. Linear search regardless of element order: ( )
2. Linear search taking into account the element order: ( )
3. Binary search: ( )

Answers 3 **(See Syracuse –** ***3 points*****)**

Specifications:

The function `syracuse(`n`)` builds the list L of all the Syracuse sequence numbers from n if $n \geq 1$. Otherwise, it returns an empty list.

Answers 4 **(Arithmetic progression –** ***4 points*****)**

Specifications:

The function `arithmetic(`L`)` tests whether the list L has at least two elements and follows an arithmetic progression. In this case, it returns the common difference, otherwise it returns 0.

Answers 5 **(Deletion in sorted list – *5 points*)**

Specifications:

The function `delete(`L`, `x`)` removes the value x, if it exists, from the list L sorted in strictly increasing order and returns a boolean that indicates whether the deletion occurred.

***Answers 6* (What is it? – *3 points*)**

1. *Result of the following application of* `what`*:*

```
1  >>> what([1,3,2,8,7,2,5,4,0,6,2,15])
2 .
3 .
```

2. We call `what(`L`)` with L a list of natural numbers.

   (a) At the end of the first loop, what does `me` represent?

   (b) At the end of the third loop, what does `X` represent?

   (c) What does this function returns?

3. **Bonus:** What is the complexity of this function?