

Statistics of

Bebras 2010 Mandatory tasks



Lietuvos
mokslo
taryba



ŠVIETIMO IR MOKSLO MINISTERIJA



Ieva Jonaitytė

Vilnius University



Percentage of:

VII-VIII

IX-X

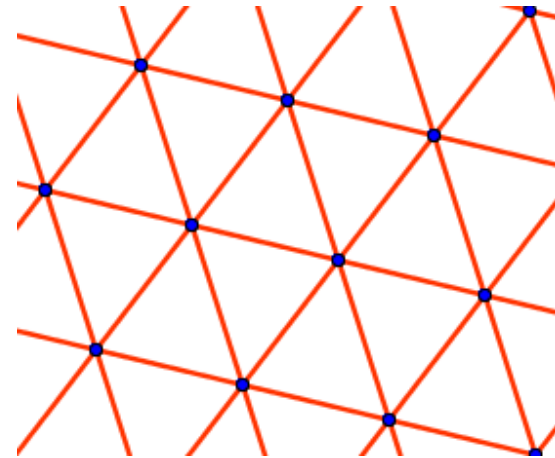
XI-XII

- *Right answers*
- *No answers*
- *Girls/Boys rate*
- *Averages in countries*
- *Ecxeptions and extreemes*



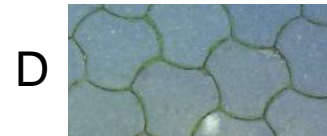
A pavement (Junior-Medium), Lowest G/B rate (0,83)

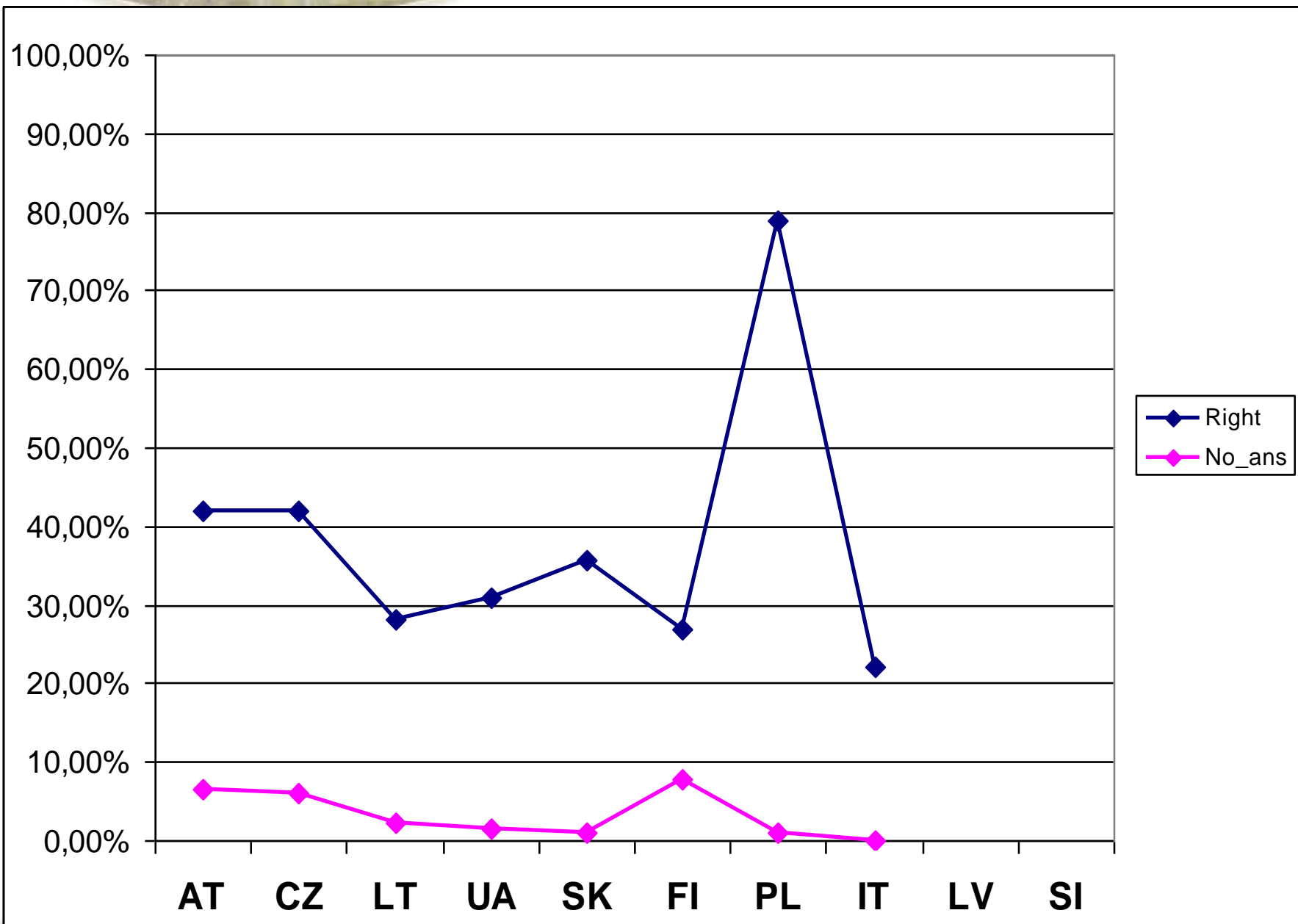
Peter took a photo of a pavement in front of his house and then created a graph which describes the paving (see pictures).

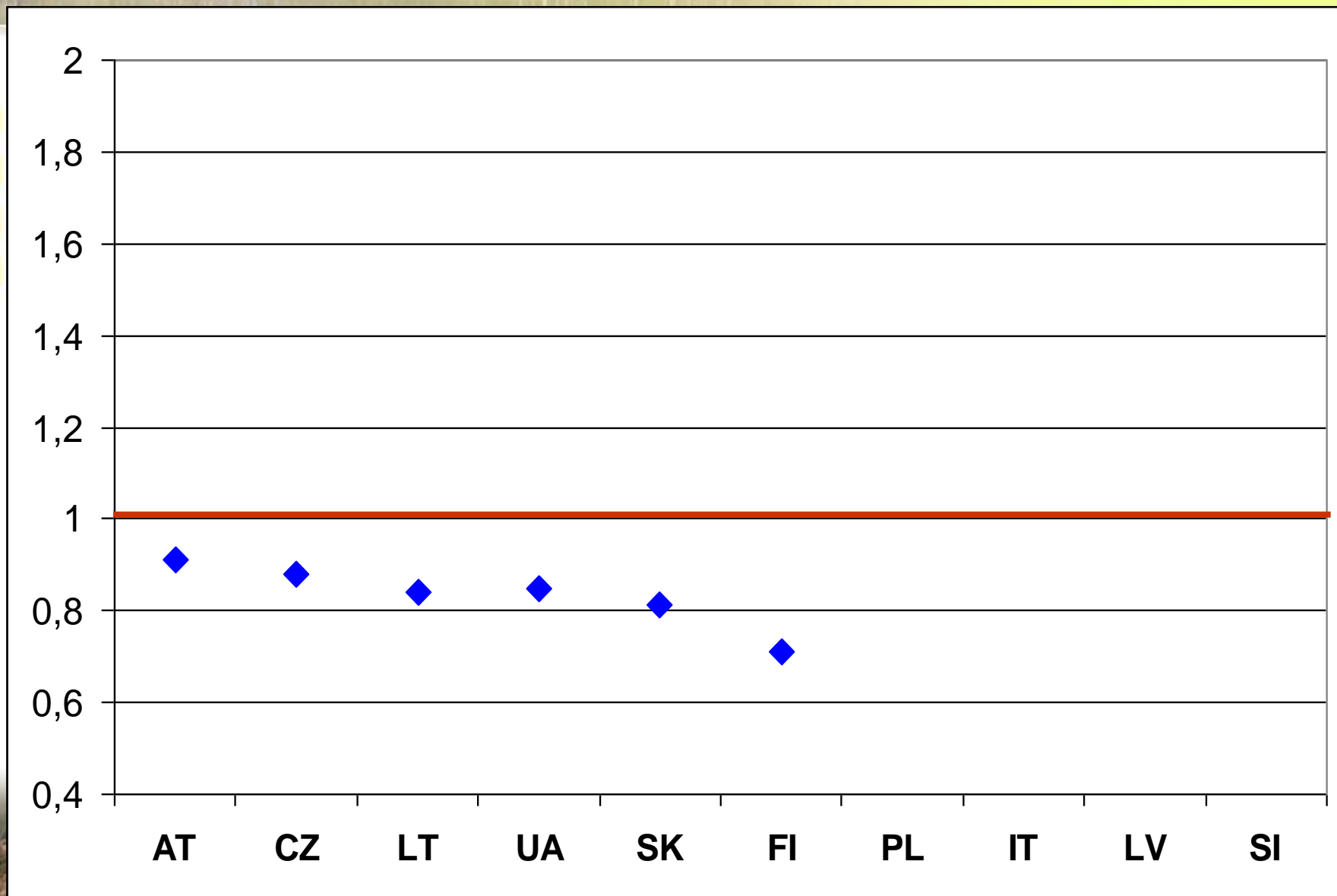


A point on the graph represents a tile. A line joining two points represents any two tiles bordering.

Later Peter was walking in the town and was photographing pavements. When he returned home he realized that all pavements (except of one) were suitable to fit his graph. Can you recognize which of them was not?







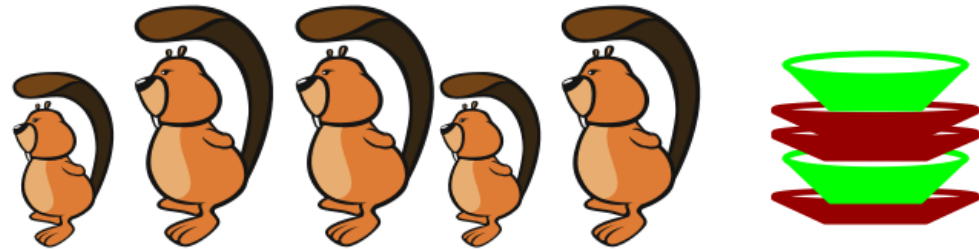
Stack of plates (Benjamin - Medium) - easiest task (68,74%)

Least unanswered (1,95%)

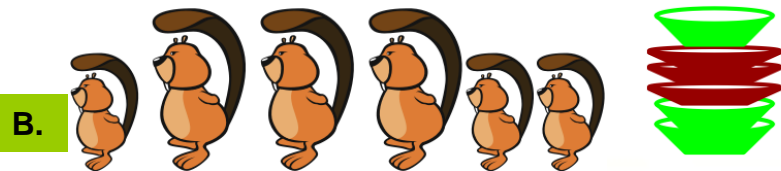
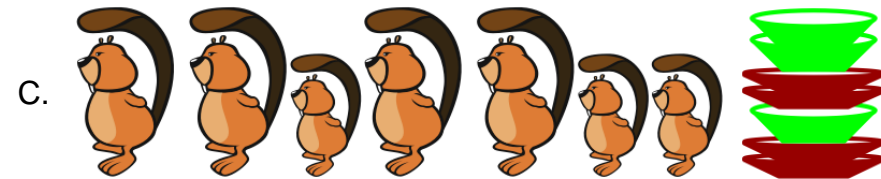
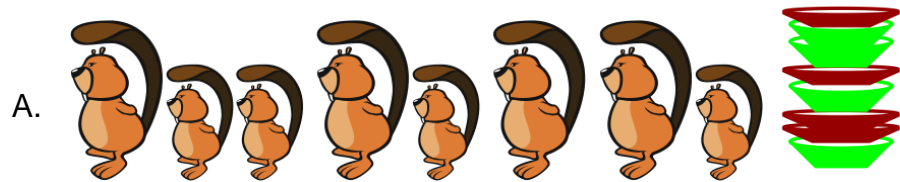
In the restaurant of the Beaver school, there are two different kinds of plates: the high green ones for the small beavers and the flat brown ones for the big beavers.

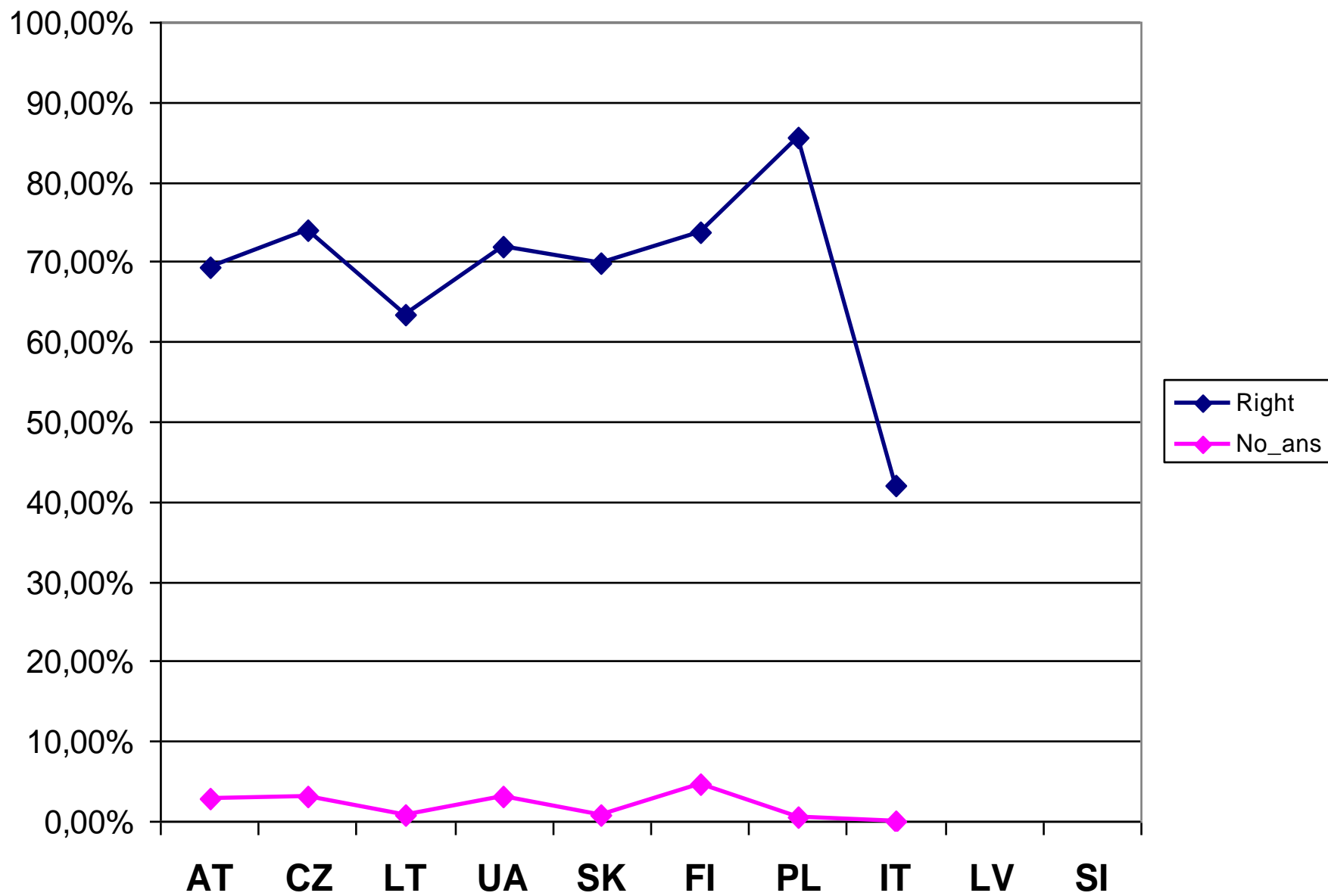
One day, due to building activities, there is only room for one stack of plates.

The beaver kids are queuing for their lunch, and the kitchen beavers need to put the plates on the stack in the right order to make the stack match the queue. Example:

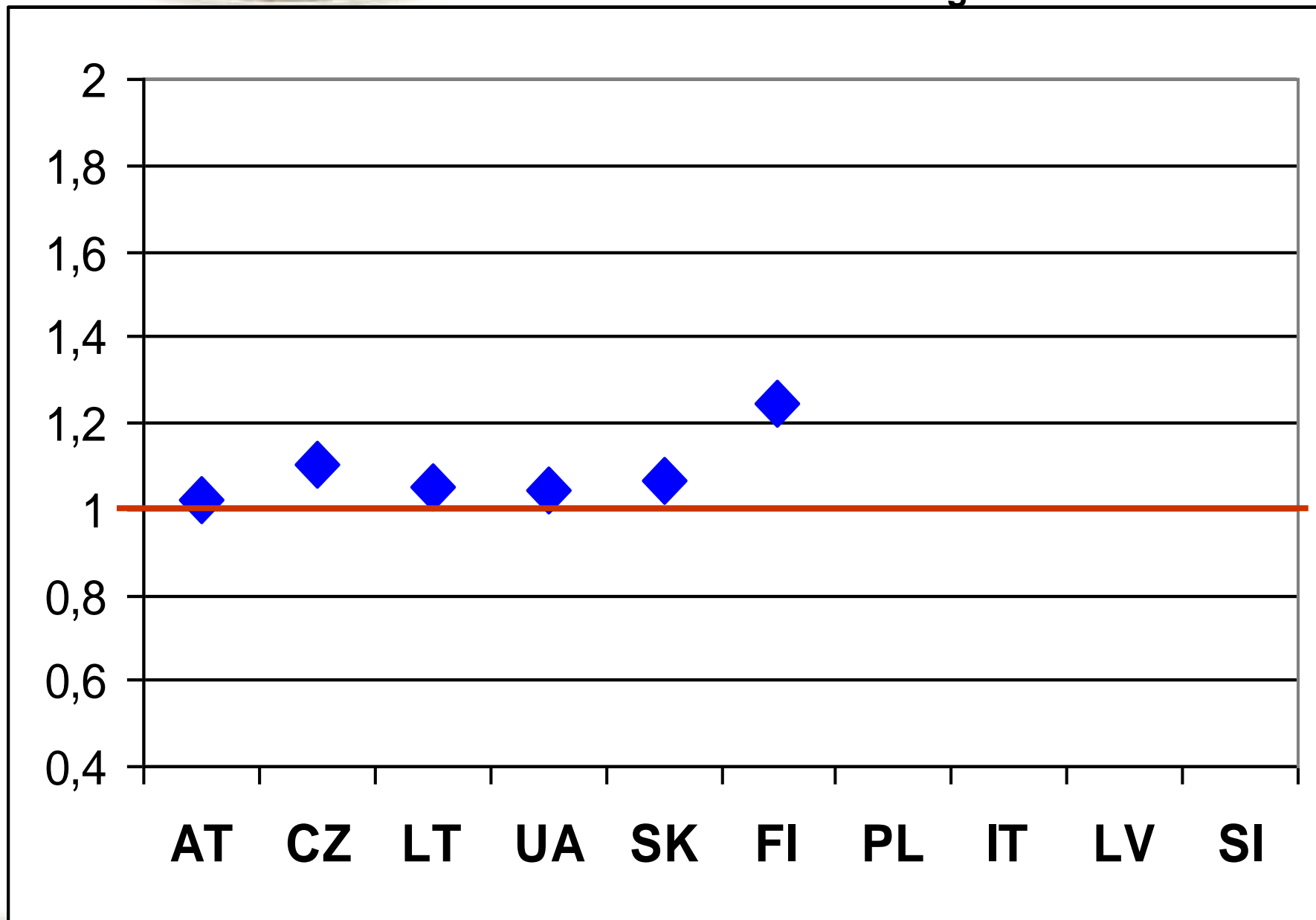


In one of the following pairs of plate stacks and beaver queues, there is a mismatch between queue and stack. In which one?





Easier for girls



OX (Senior - Medium)

Here is a line of text, containing only underscores and one single X. The cursor (denoted by |) is placed at the very beginning of the line.

| _ _ _ _ _ _ _ _ _ _ X _ _ _ _ _

Attention, the system is in the overwrite mode. That means, whenever you type a character you replace the character after the cursor and then the cursor moves to the right. Imagine you follow these instructions:

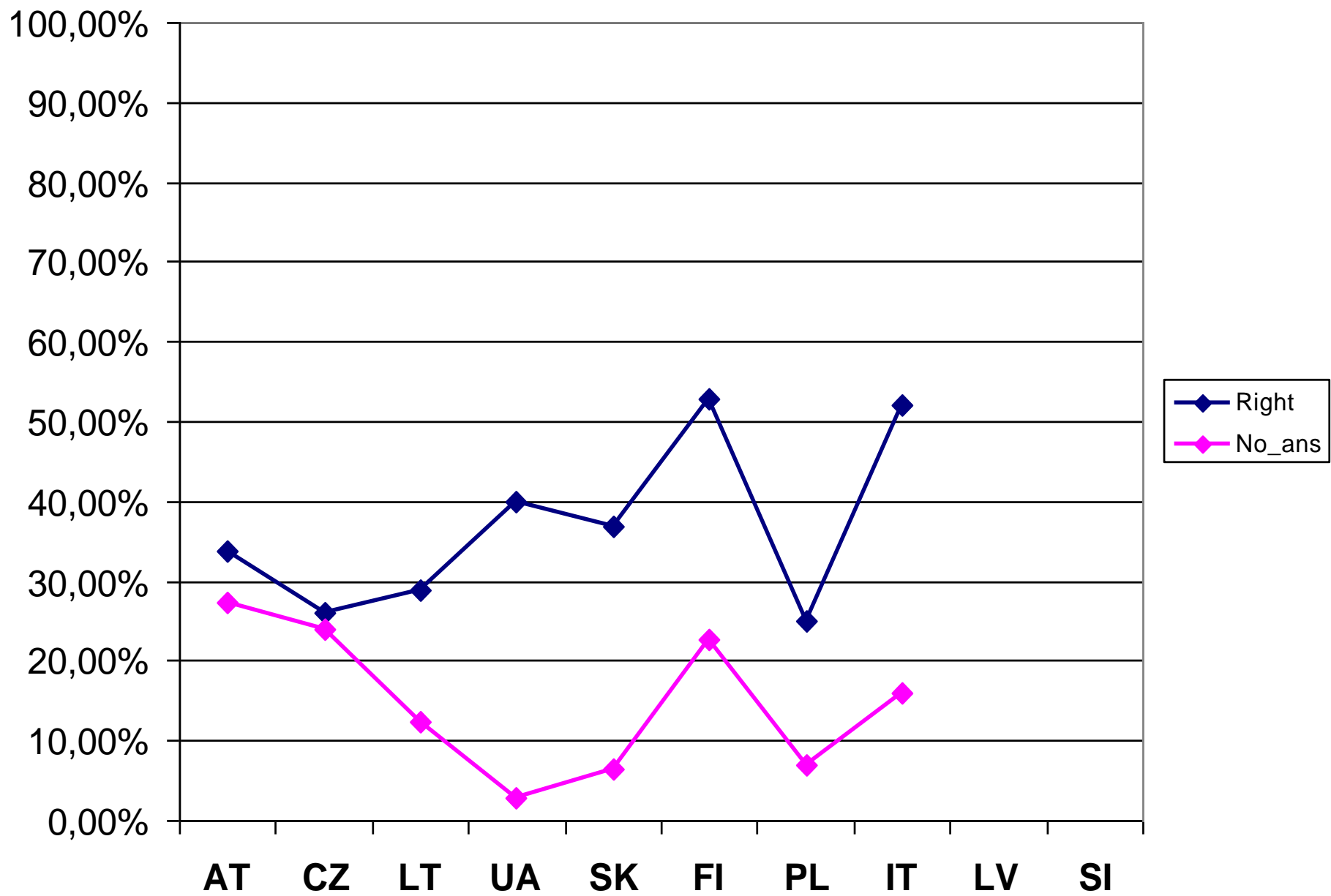
*While the cursor is not at an X
write an O*

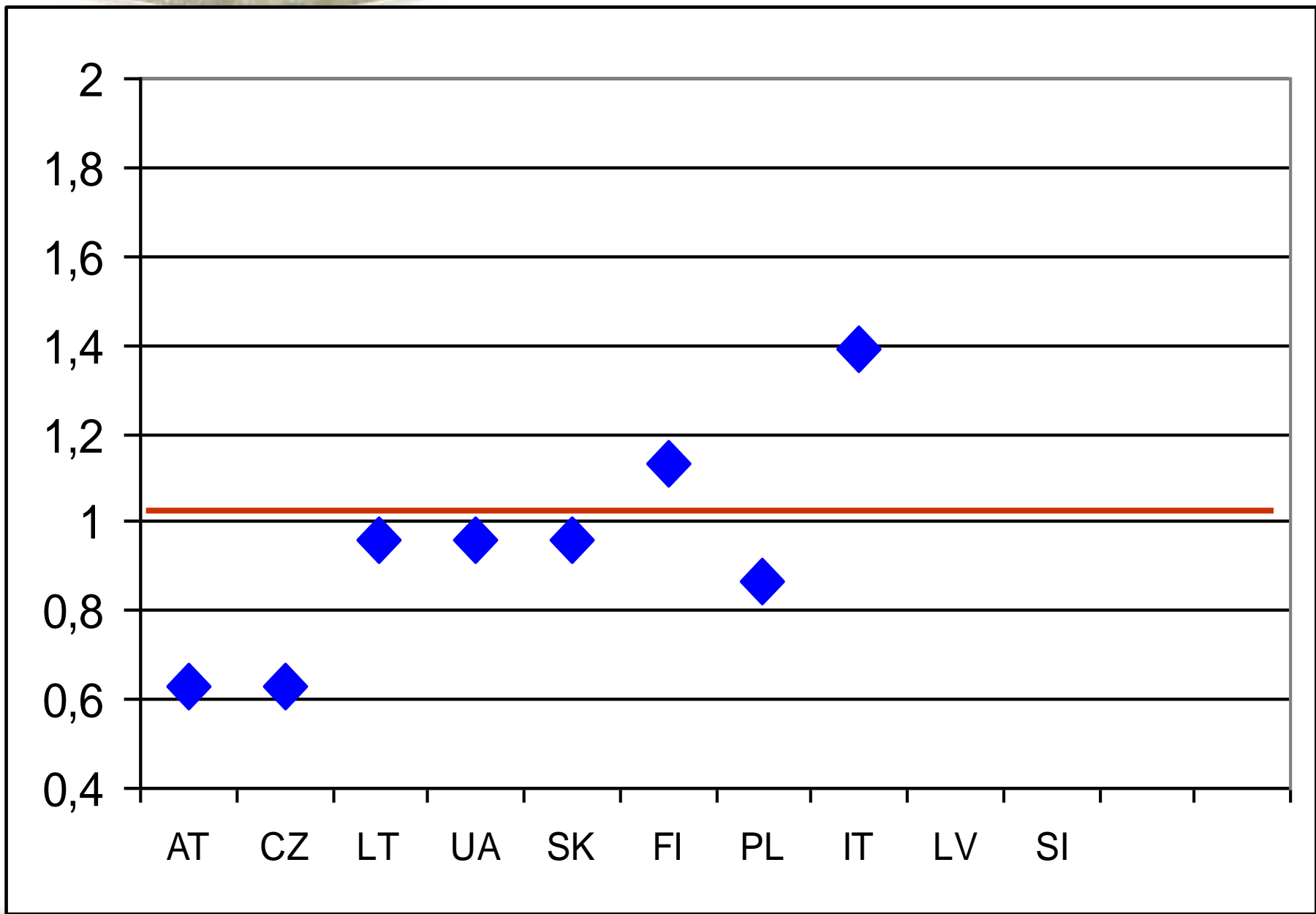
*While the cursor is not at the beginning of the line
write an X and move the cursor two places to the left*

How will the above line of text look afterwards?

- A) X X X X X X X X X X X X X X X O O O O O O |
- B) O O O O O O O O O O O O O O O X X X X X X |
- C) | _ O O O O O O O O O O O O O O _ _ _ _ _
- D) | O X X X X X X X X X X X X X X _ _ _ _ _**



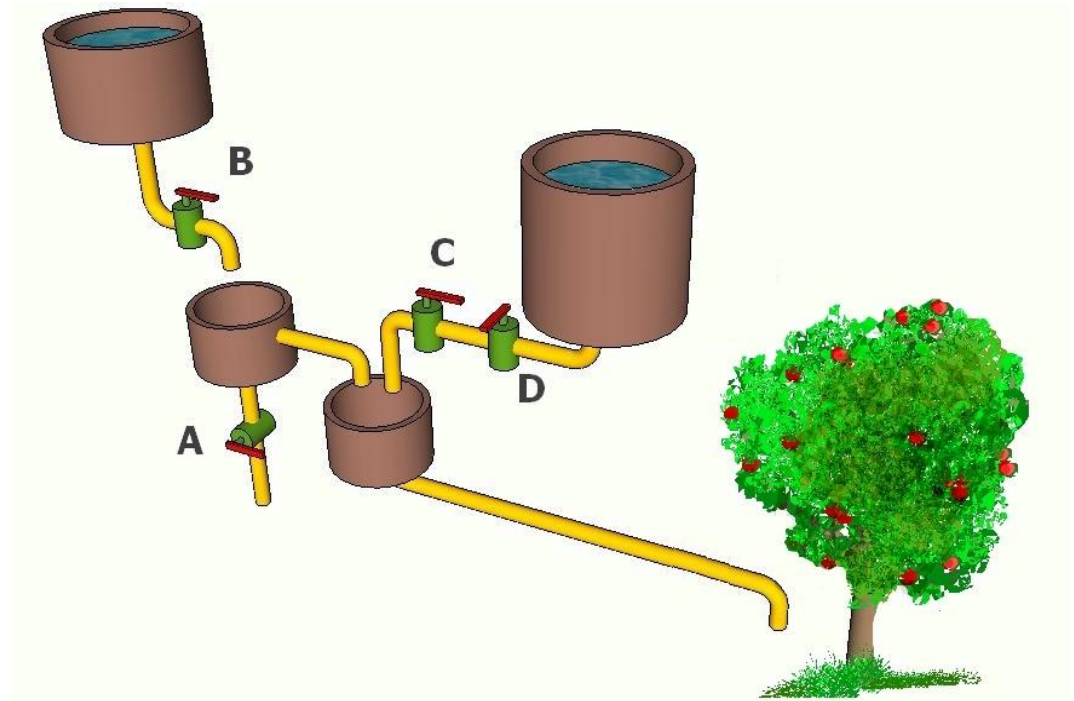




Water supply (Benjamin - Medium)

Beaver has constructed a pipeline system to water his apple tree. In which case the apple tree gets water?

The expressions contain variables A, B, C, D, which may be true or false. A variable has the value true, if the corresponding gate is open, and false, if it is closed.

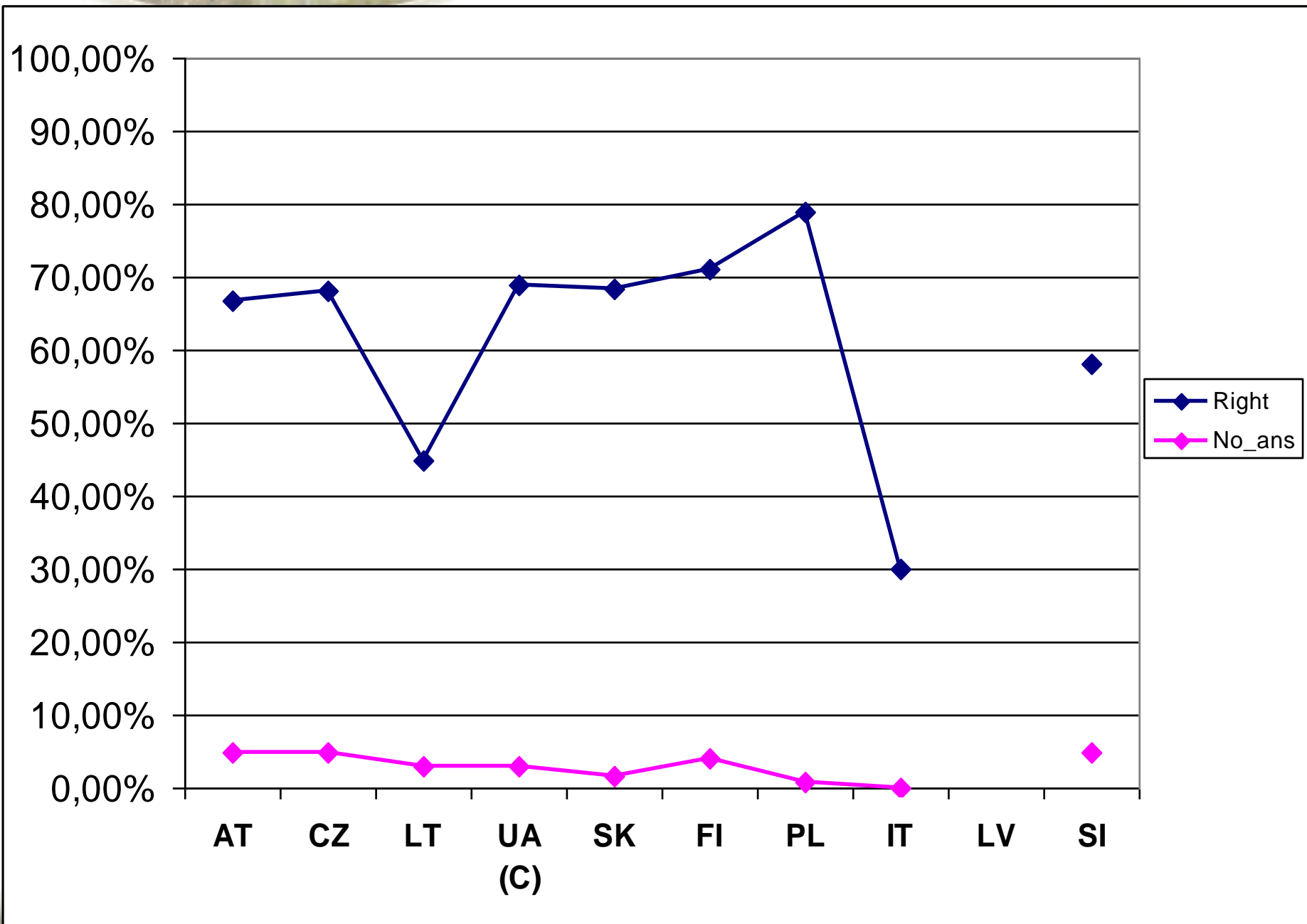


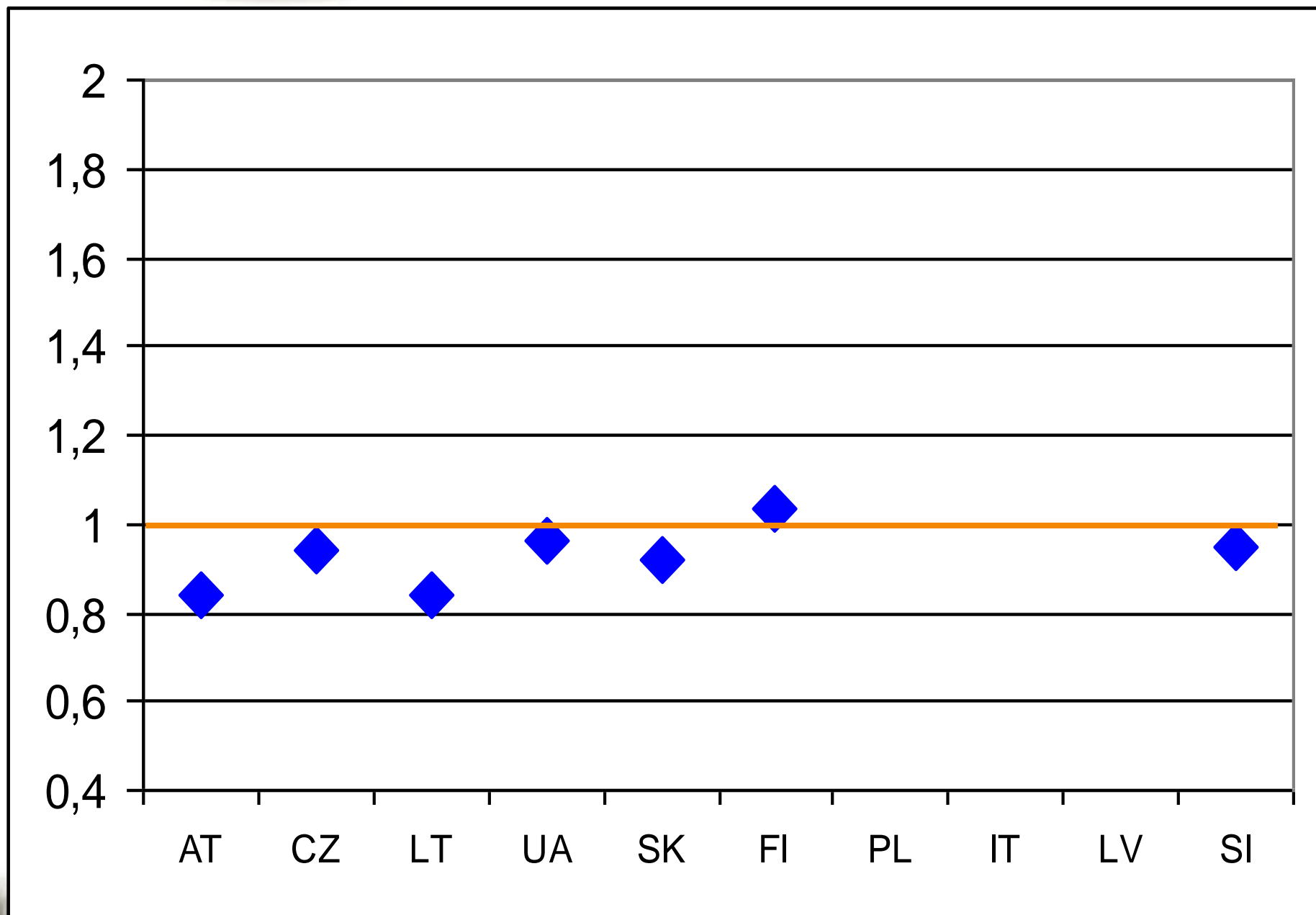
1) **A = false, B = true, C = false, D = false**

2) A = true, B = true, C = false, D = false

3) A = true, B = false, C = false, D = true

4) A = false, B = false, C = false, D = true

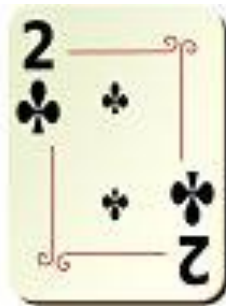




Sorting game (Cadet - Hard)

On the break at the Beaver School pupils play sorting game with playing cards. In the game the cards must be ordered to the ascending order by switching the adjacent cards. Only numbers count, not the suits of the cards. If the numbers of the cards are in the right order you are not allowed to switch those cards.

How many moves does the game take with cards with the cards on the picture?



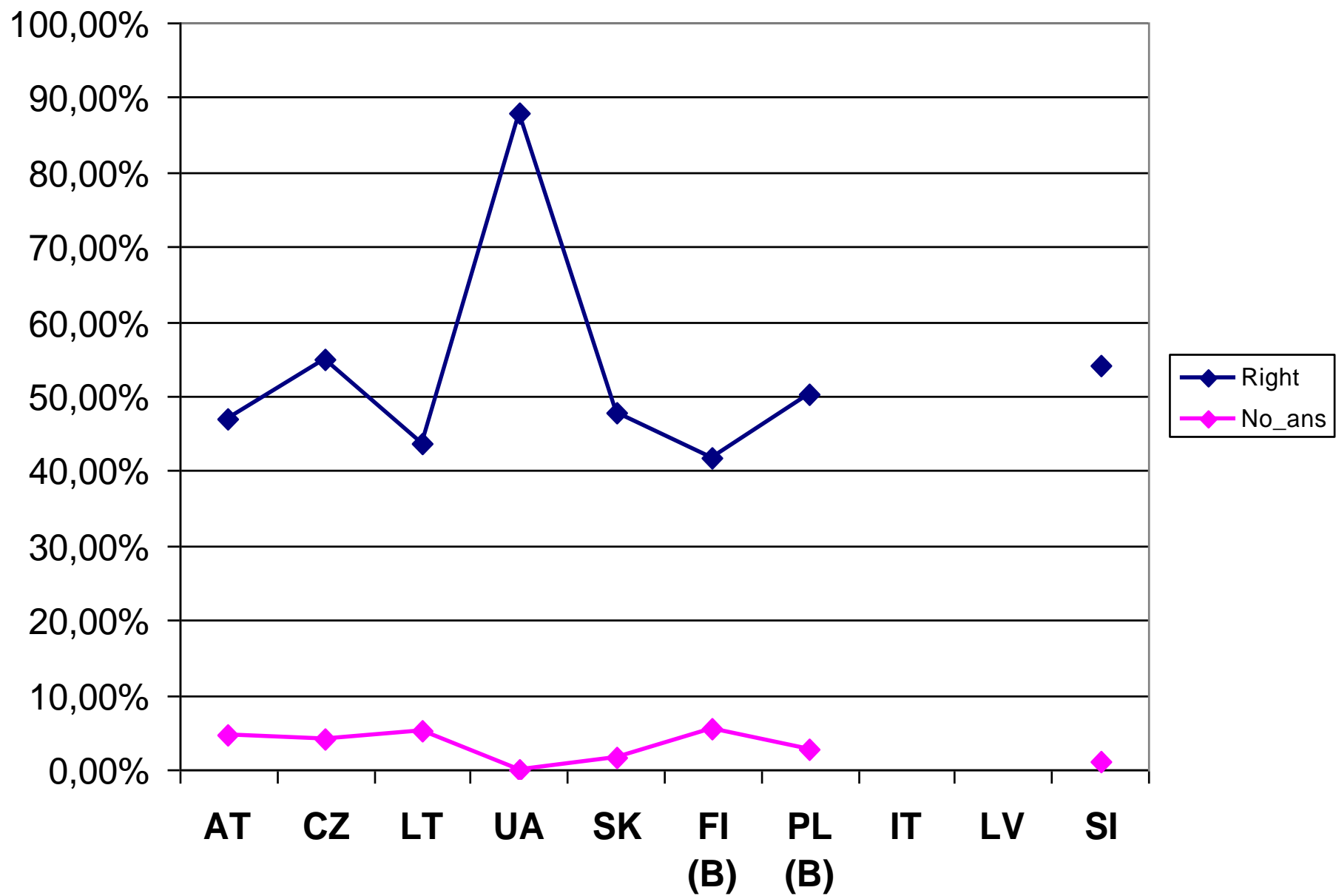
a) 4

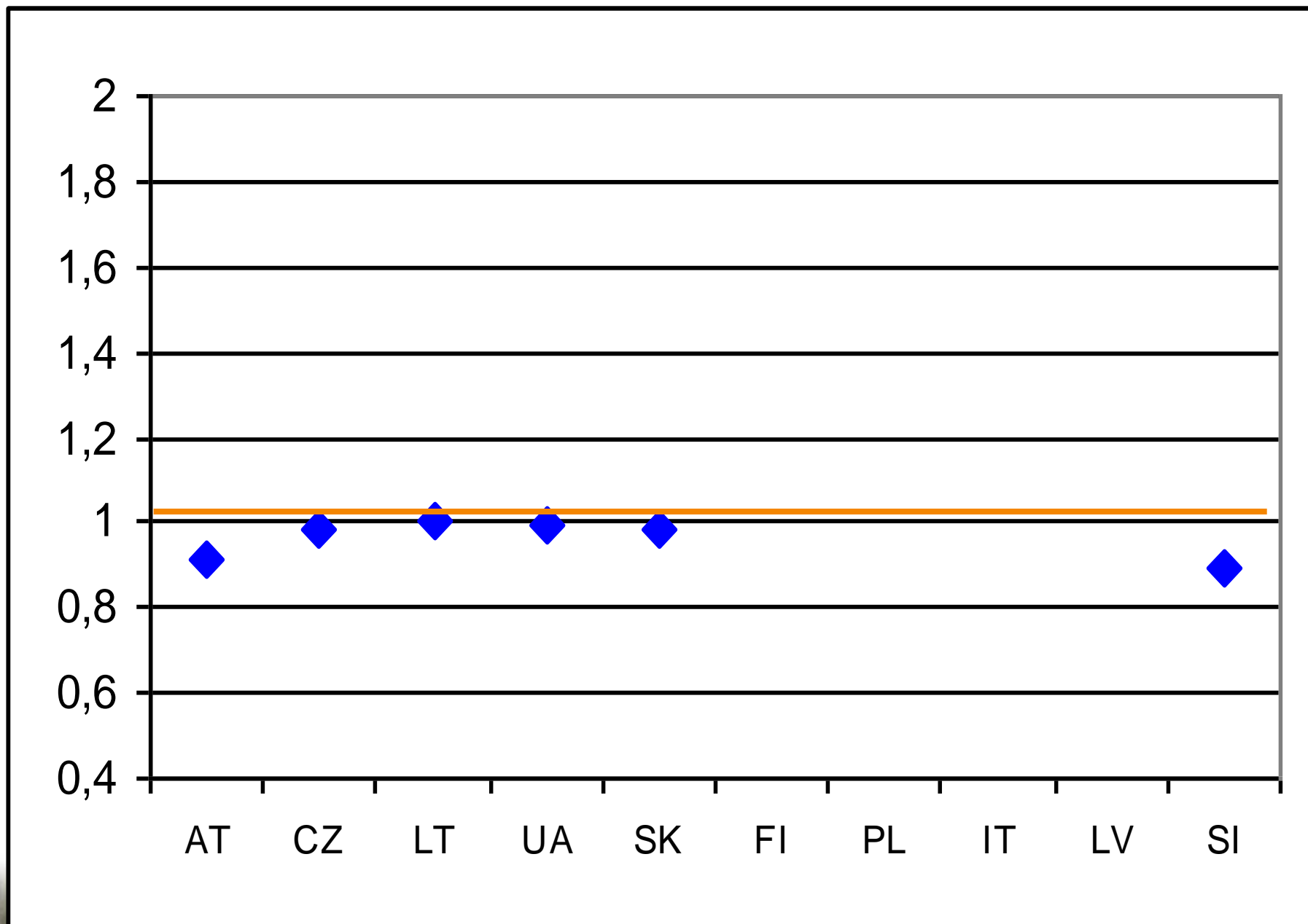
b) 5

c) 6

d) 7

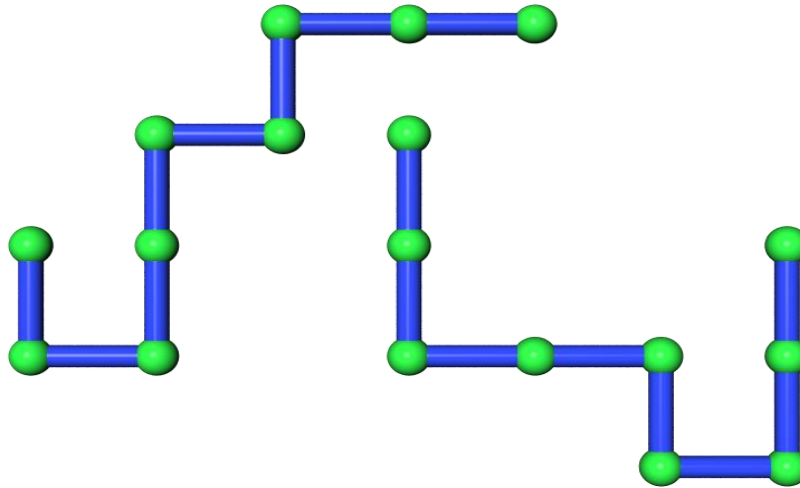






Twiddling (Junior - Medium) - hardest (28,13%)

Each of these two pieces of tube is made of 8 equal segments. These pieces are placed one above the other (they can be turned) so that they coincide partially.



What is the largest possible number of segments of their common part?

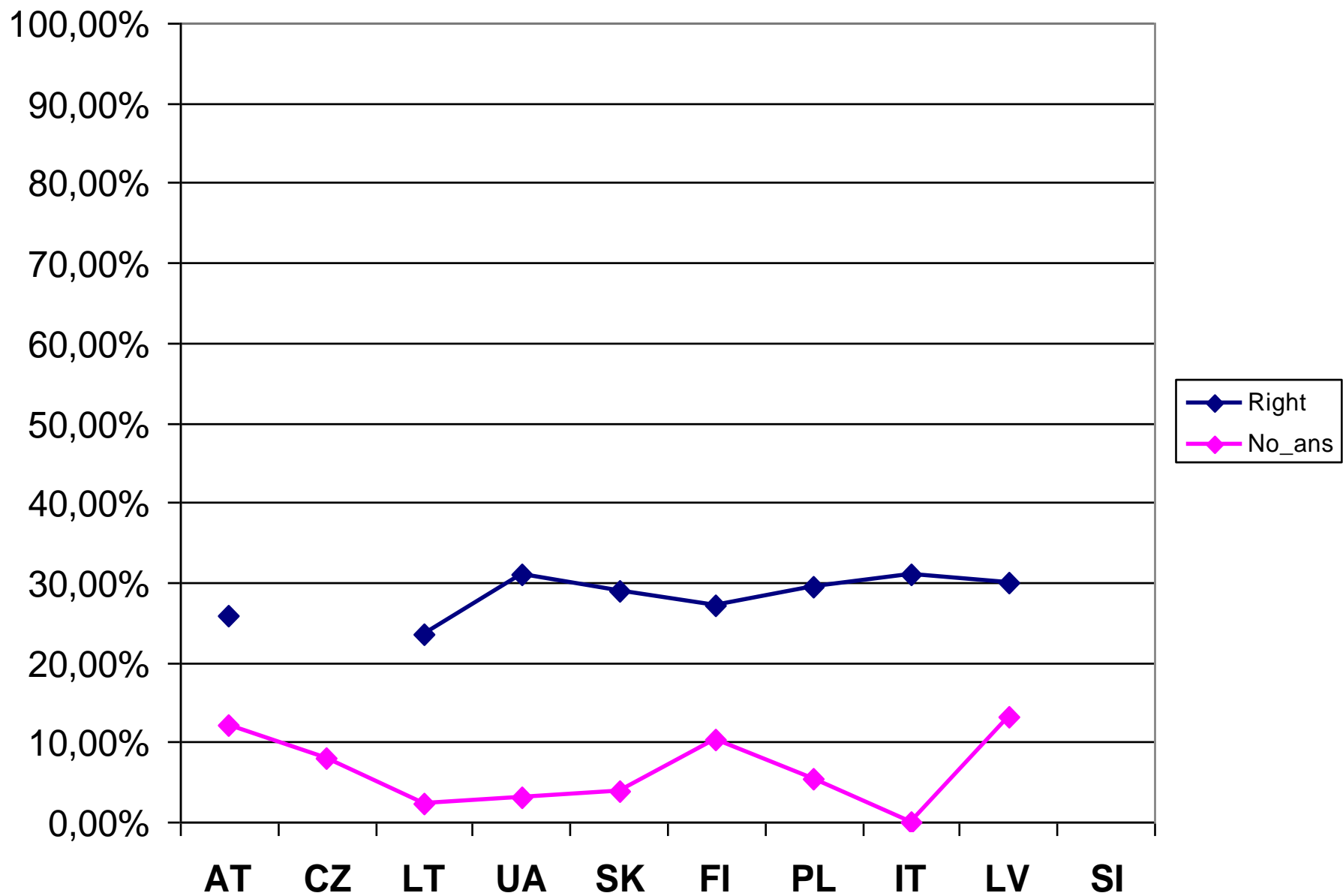
A) 6

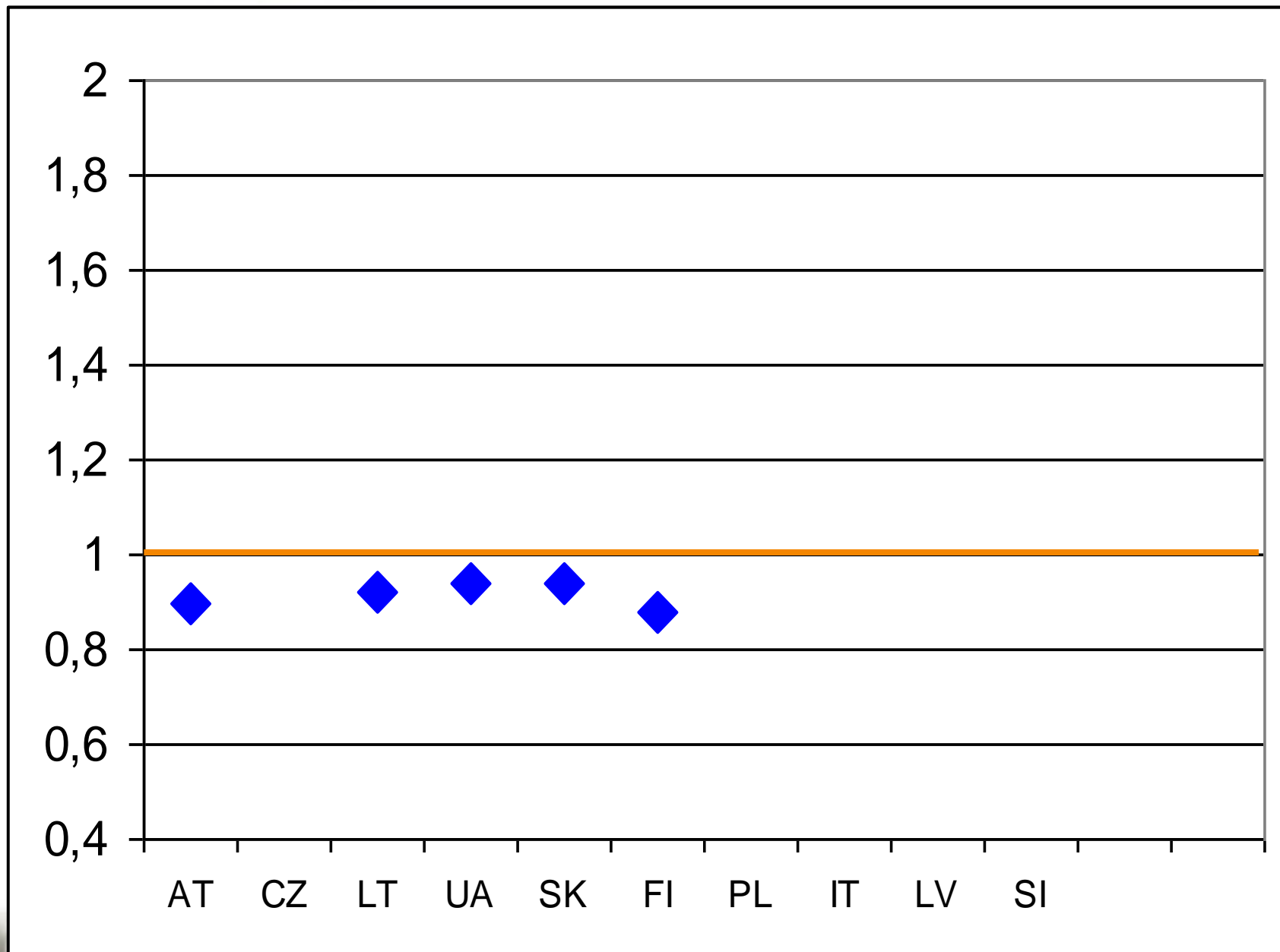
B) 5

C) 4

D) 3







Beaver in his canoe (Senior - Medium)

Beaver paddles in his canoe on a river. The river has a number of little lakes. Beaver likes all lakes of the river and has thought of an algorithm to make sure that he reaches every lake.

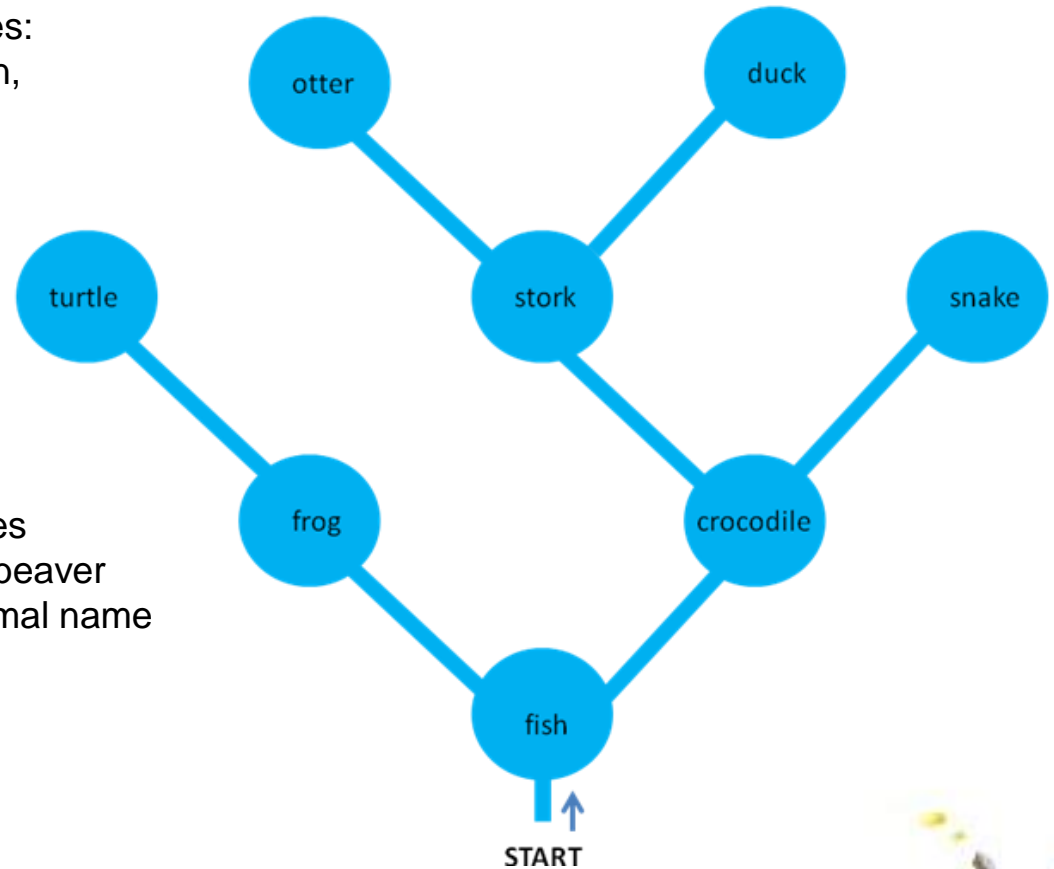
He knows that at each lake there is a maximum of two rivers that he hasn't yet seen. If beaver arrives at a lake he decides which river to take with the following rules:

- If there are two rivers he has not yet seen, he takes the river on his left hand side
- If there is one river which beaver has not yet seen, beaver takes this river
- If he has seen all the rivers from a little lake, he paddles his canoe one lake back towards the previous lake

Beaver stops his day of canoeing if he has seen everything and has come back to the start point.

In the picture you can see the river and the little lakes where beaver paddles his canoe. In each little lake beaver sees a different animal. Beaver writes down the animal name when he sees an animal for the first time.

In which order will beaver write down the animals?

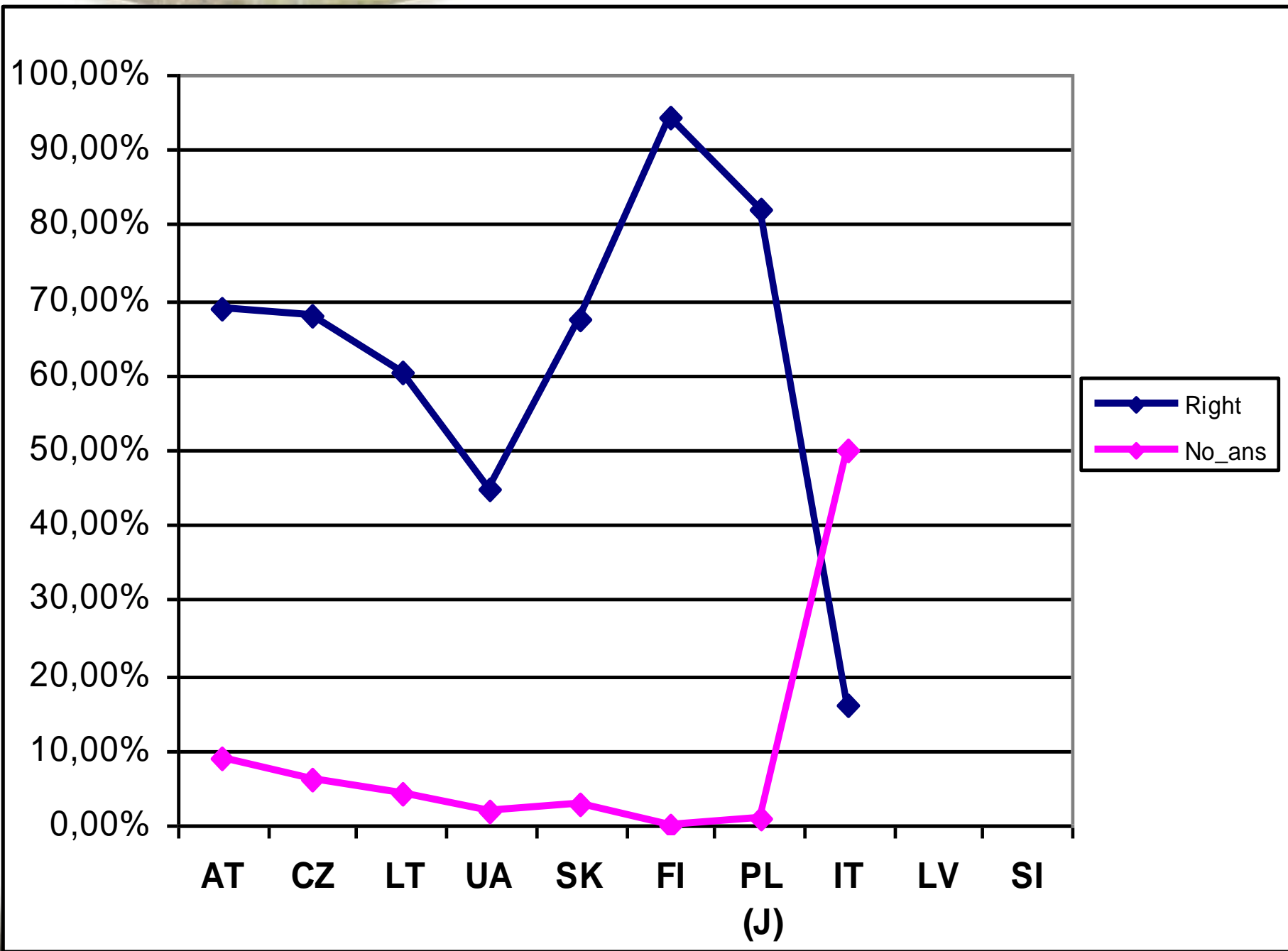


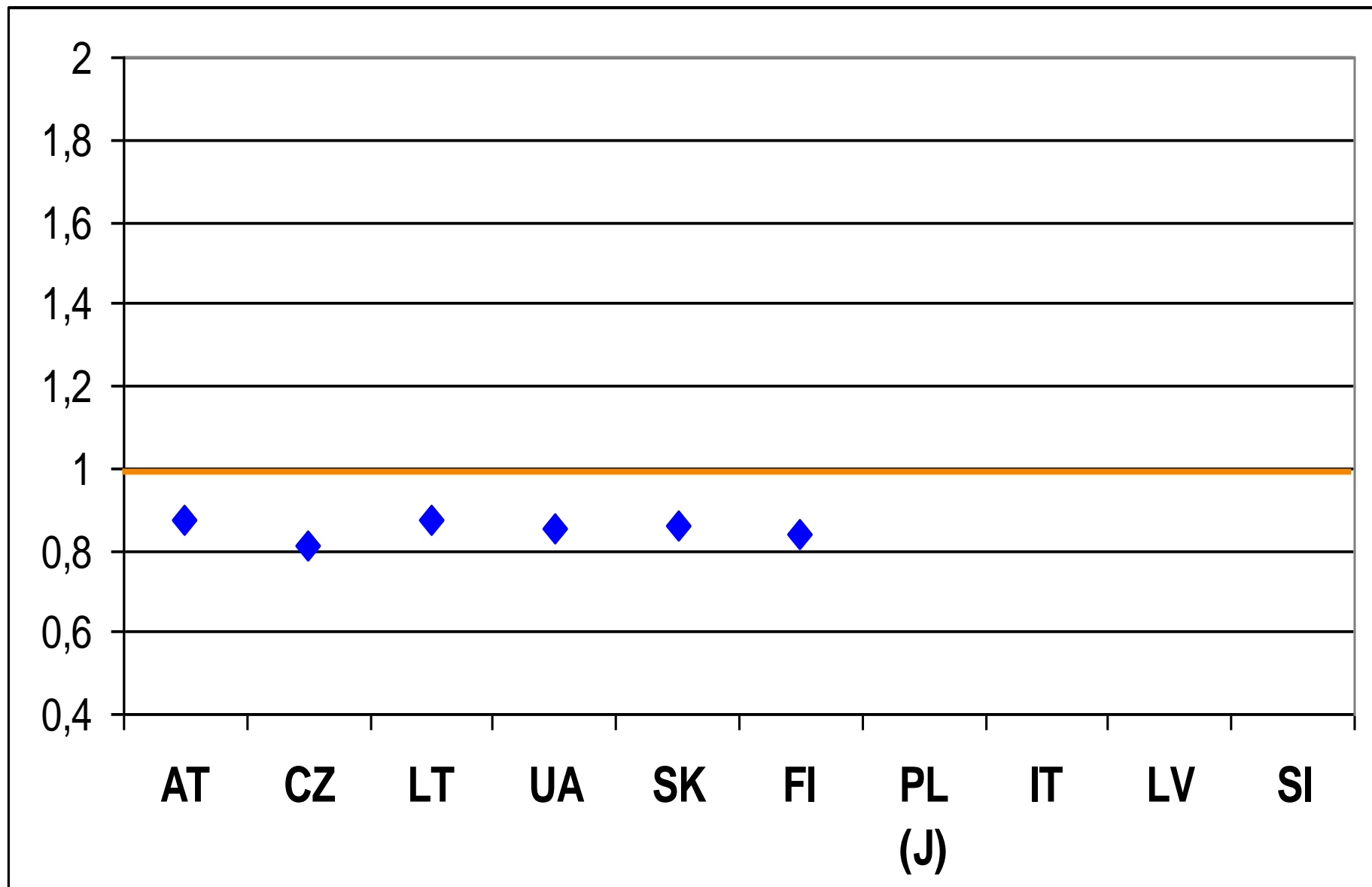
fish, frog, crocodile, turtle, stork, snake, otter, duck

fish, crocodile, snake, stork, duck, otter, frog, turtle

fish, frog, turtle, crocodile, stork, otter, duck, snake

fish, frog, turtle





Running (Cadet - Hard)

Beaver likes running. Every morning when he wakes up he runs a few blocks. Below you see exactly how beaver runs:

Activity Running

perform activity Run_block

perform activity Run_block

perform activity Run_block

Activity Run_block

perform activity Run_street

perform activity Run_street

perform activity Run_street

perform activity Run_street

Activity Run_street

Run 100 steps

Turn left

Beaver executes the activity Running. How many steps has beaver run?

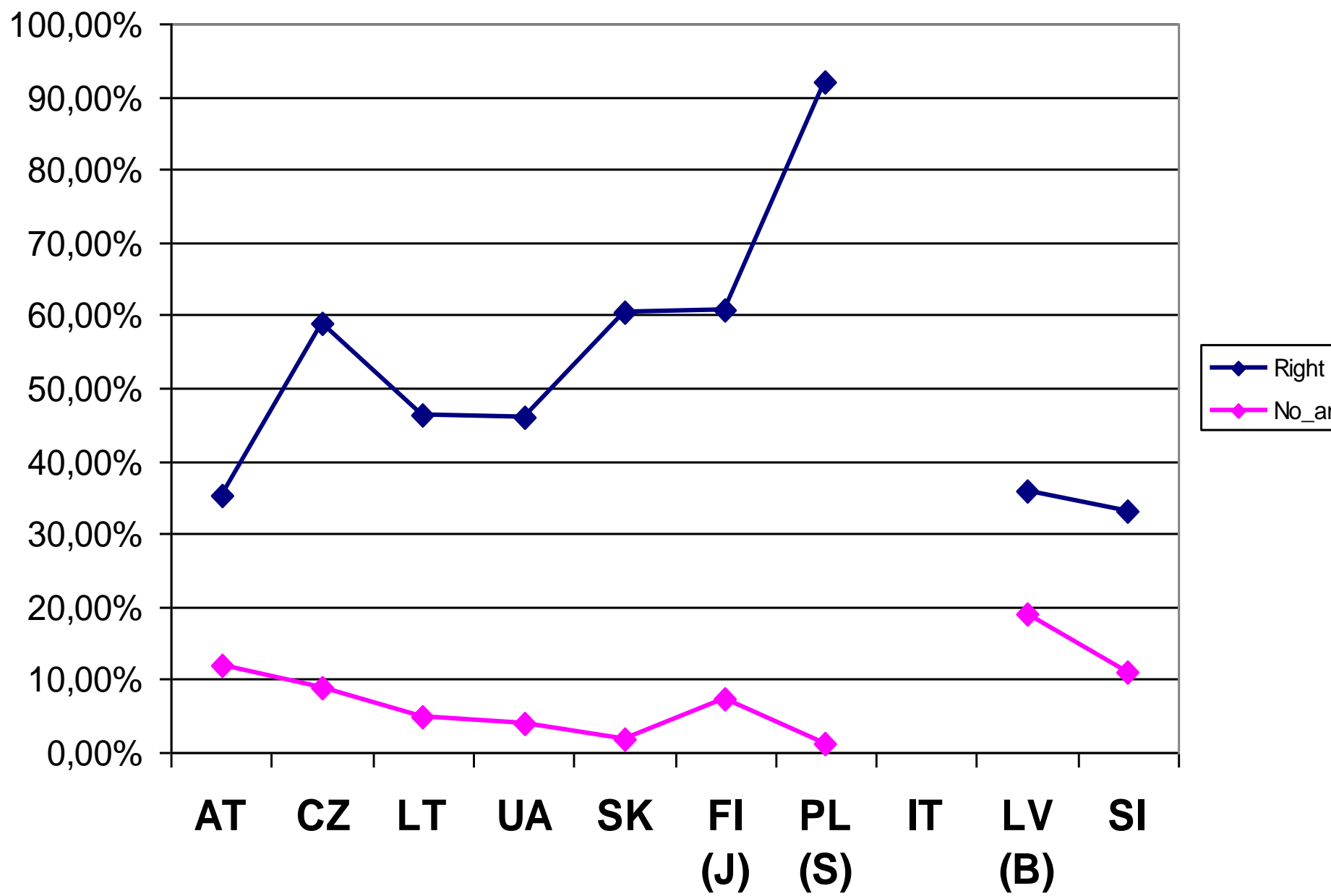
a. 100

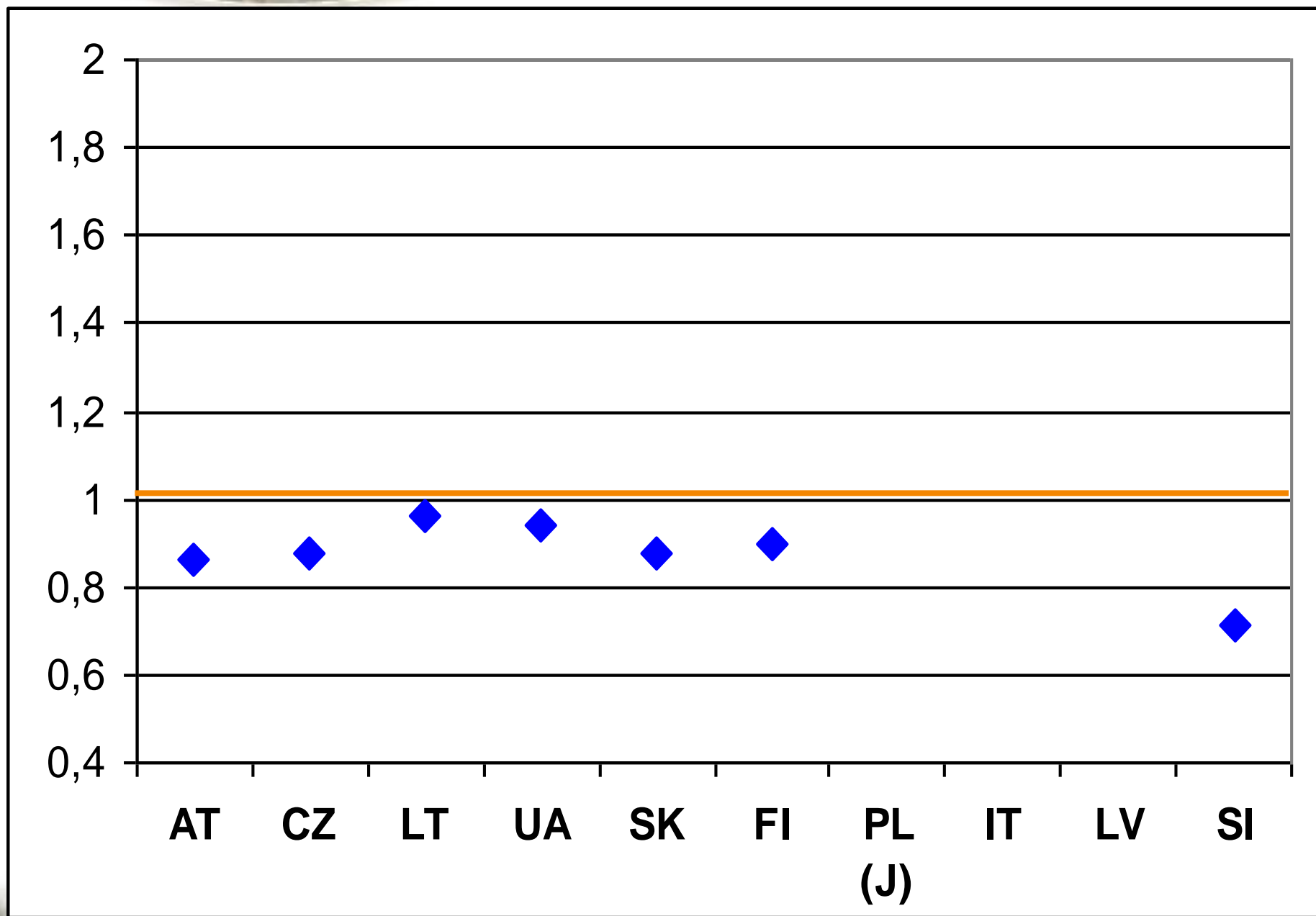
b. 300

c. 400

d. 1200







Beetle path (Benjamin – medium, C / J / S - easy)

A robotic beetle is moving around this playing field according to these rules:

	A	B	C	D	E
1	→ →	→ →	↓	↓ ↓	
2	↓ ↓	→	↓ ↓ ↓	→	
3	→	↑	↓	←	
4	→	↑ ↑ ↑	→ →	→	

- The beetle starts on a randomly chosen cell.
- In one step the beetle looks at the arrows shown at the cell where it is staying and moves to the direction of the arrows so many cells as indicated by the number of arrows (one cell if there is one arrow, two cells if there are two arrows, and three cells if there are three arrows).
- During executing one step the beetle ignores the arrows in cells that it passes through.
- The beetle repeats its steps until it either gets outside the playing field or it reaches a cell that has no arrows (column E).

A1, A2

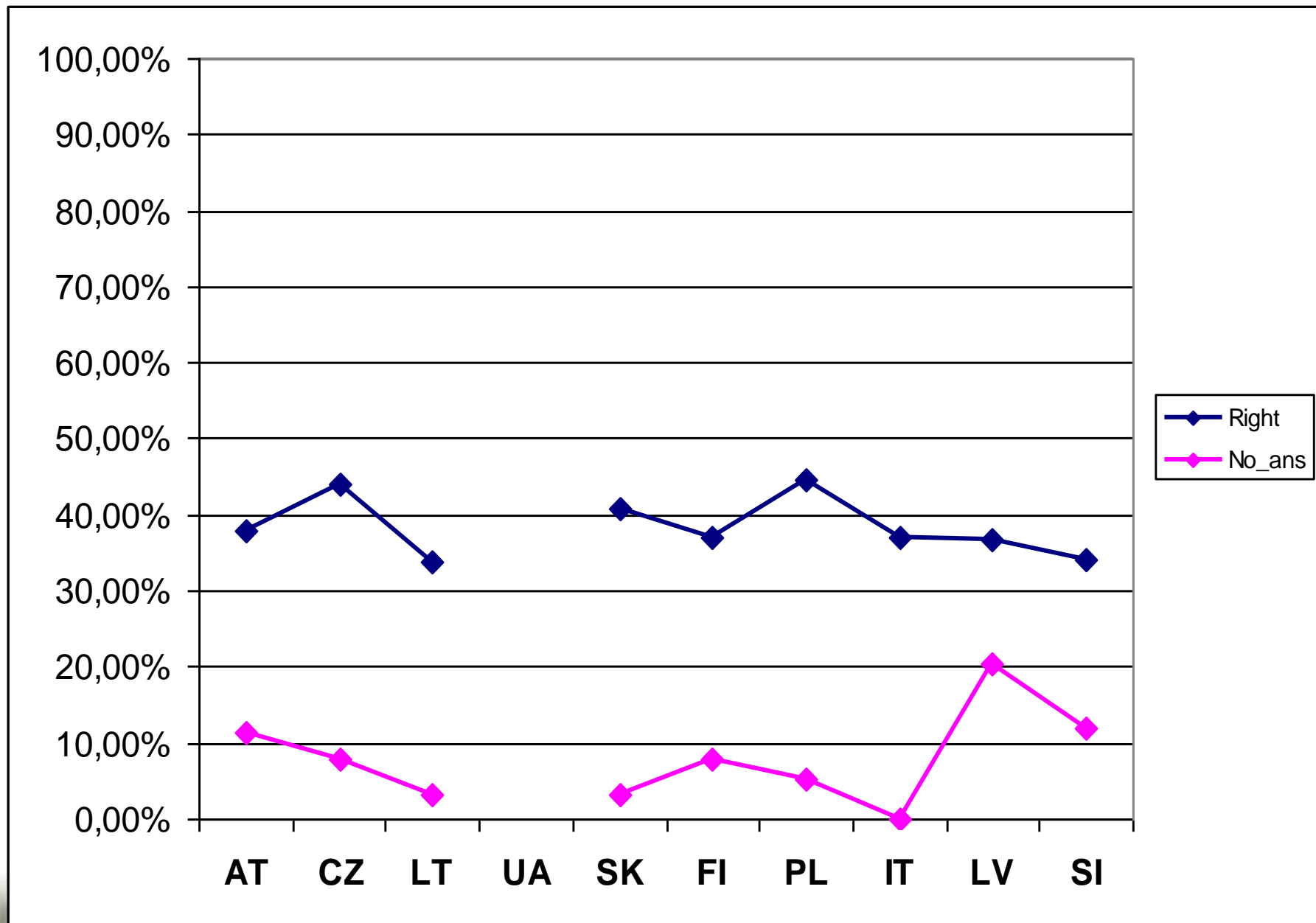
A2, A3, A4

A2, A4

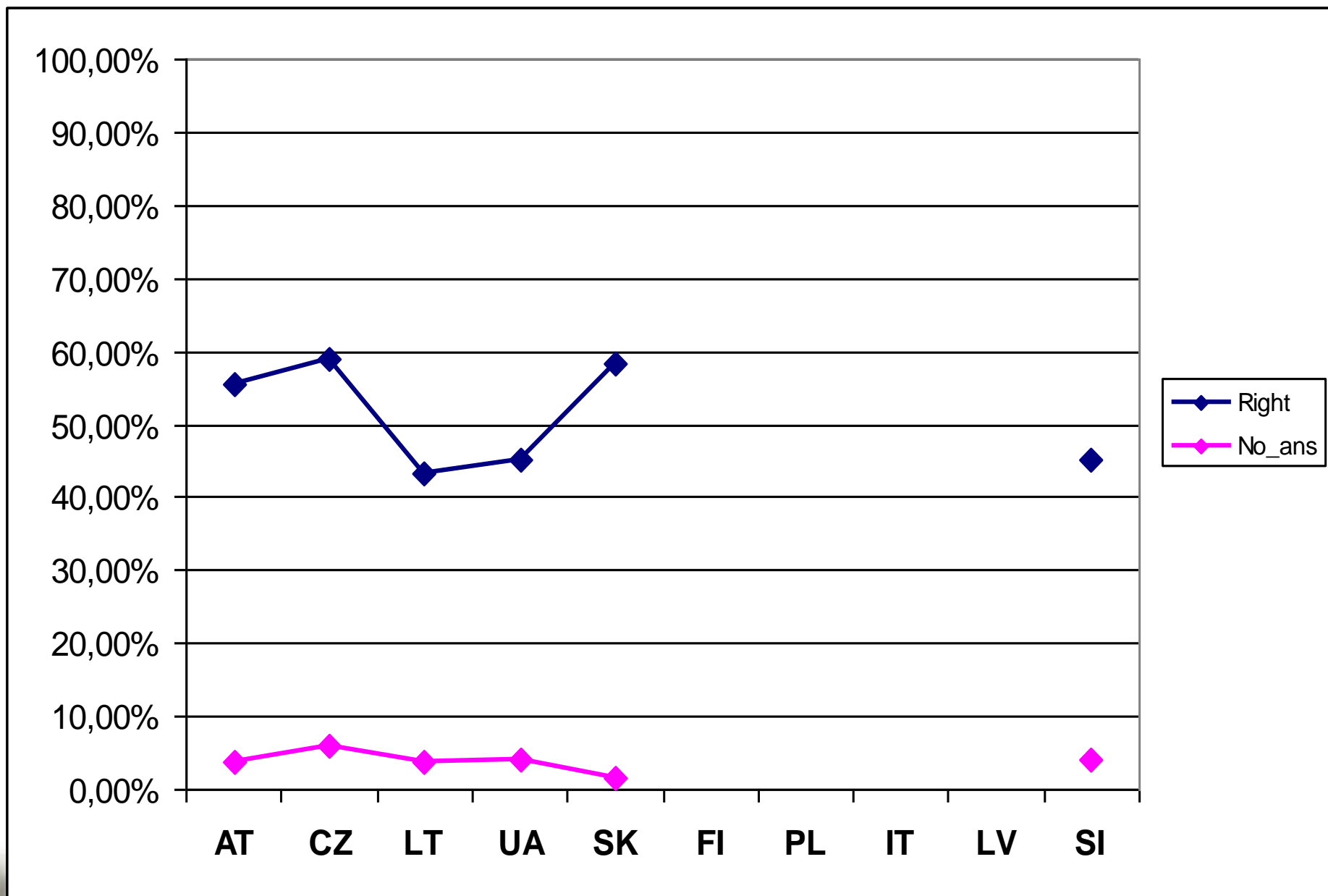
A1, A4



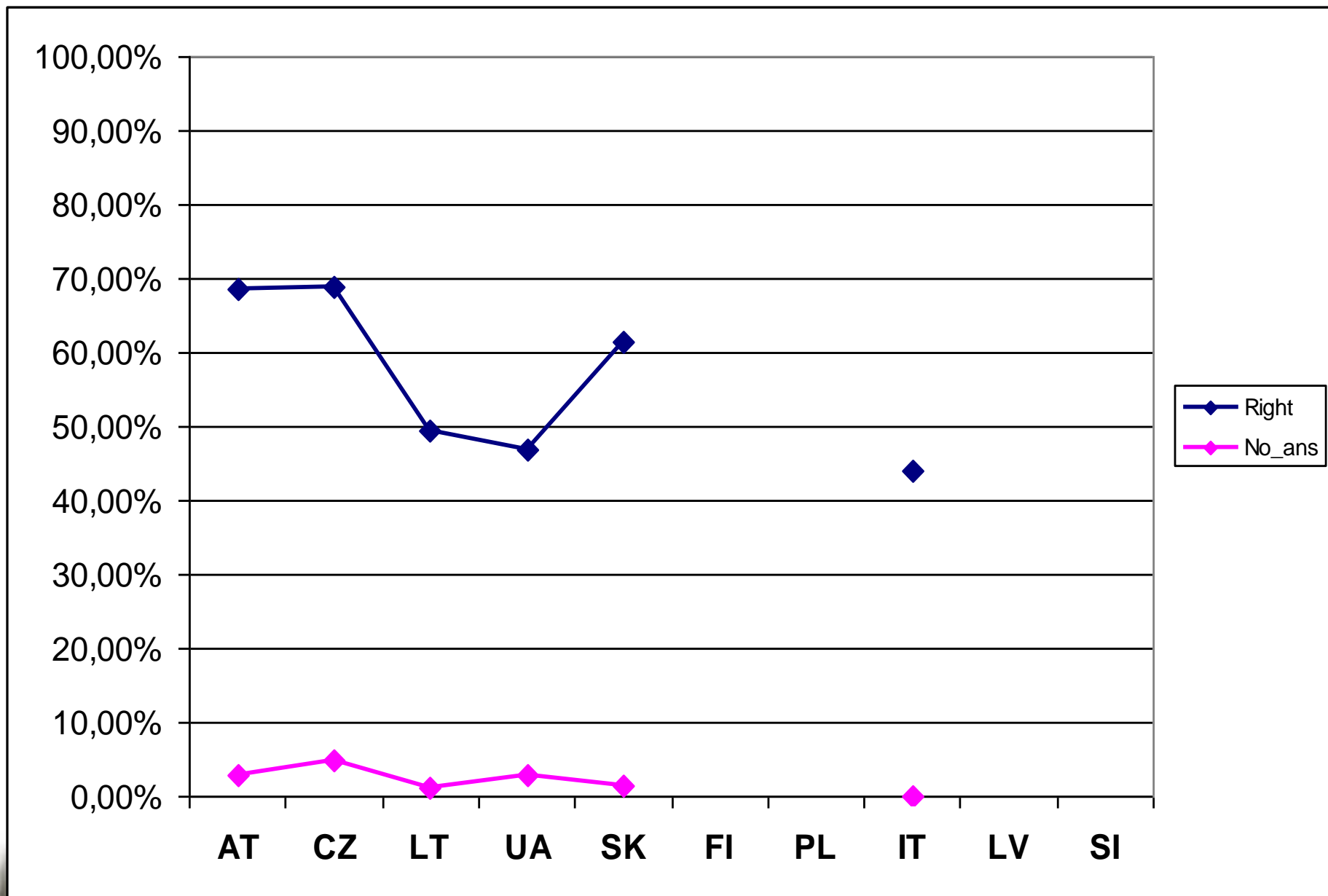
Benjamins



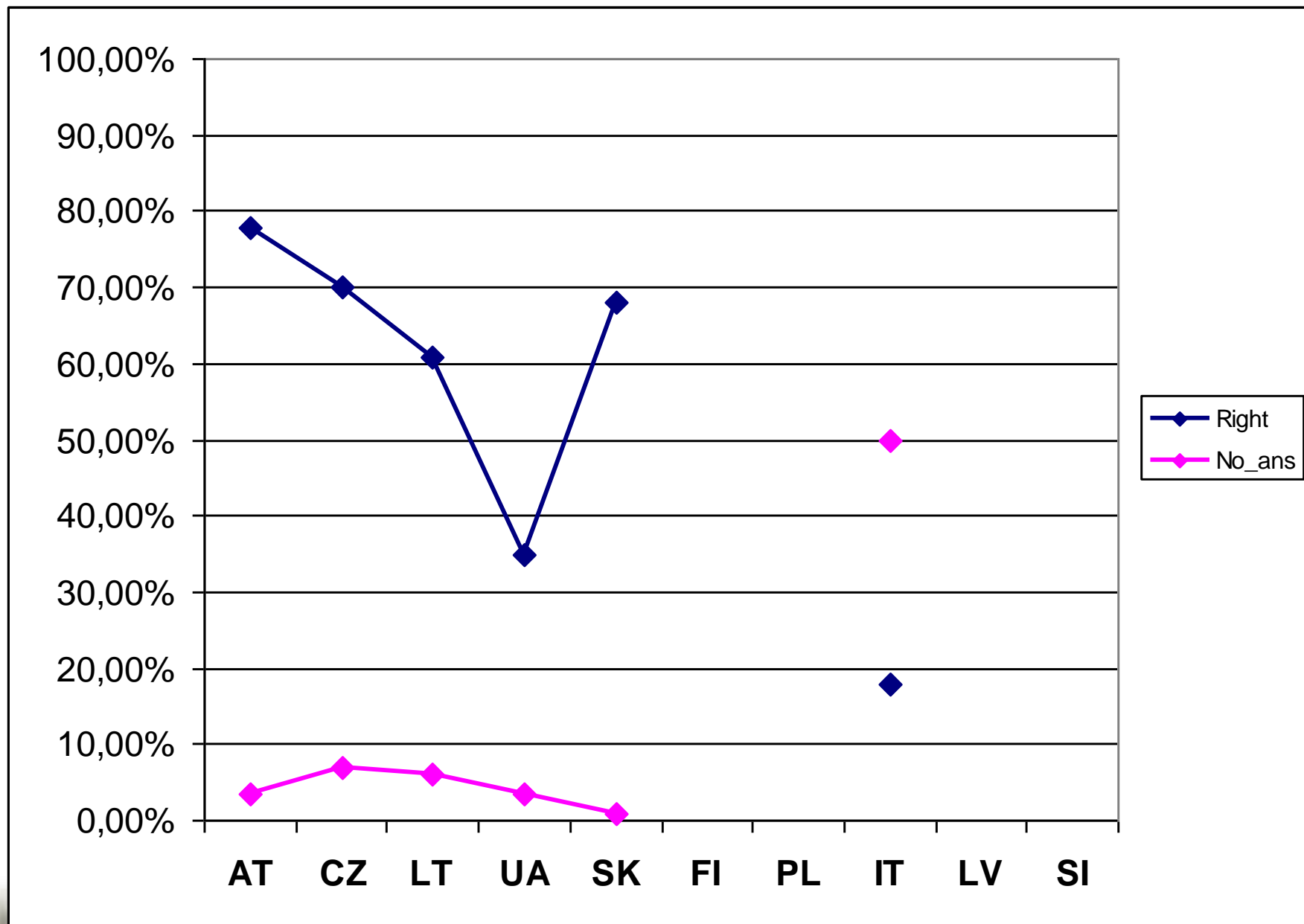
Cadets



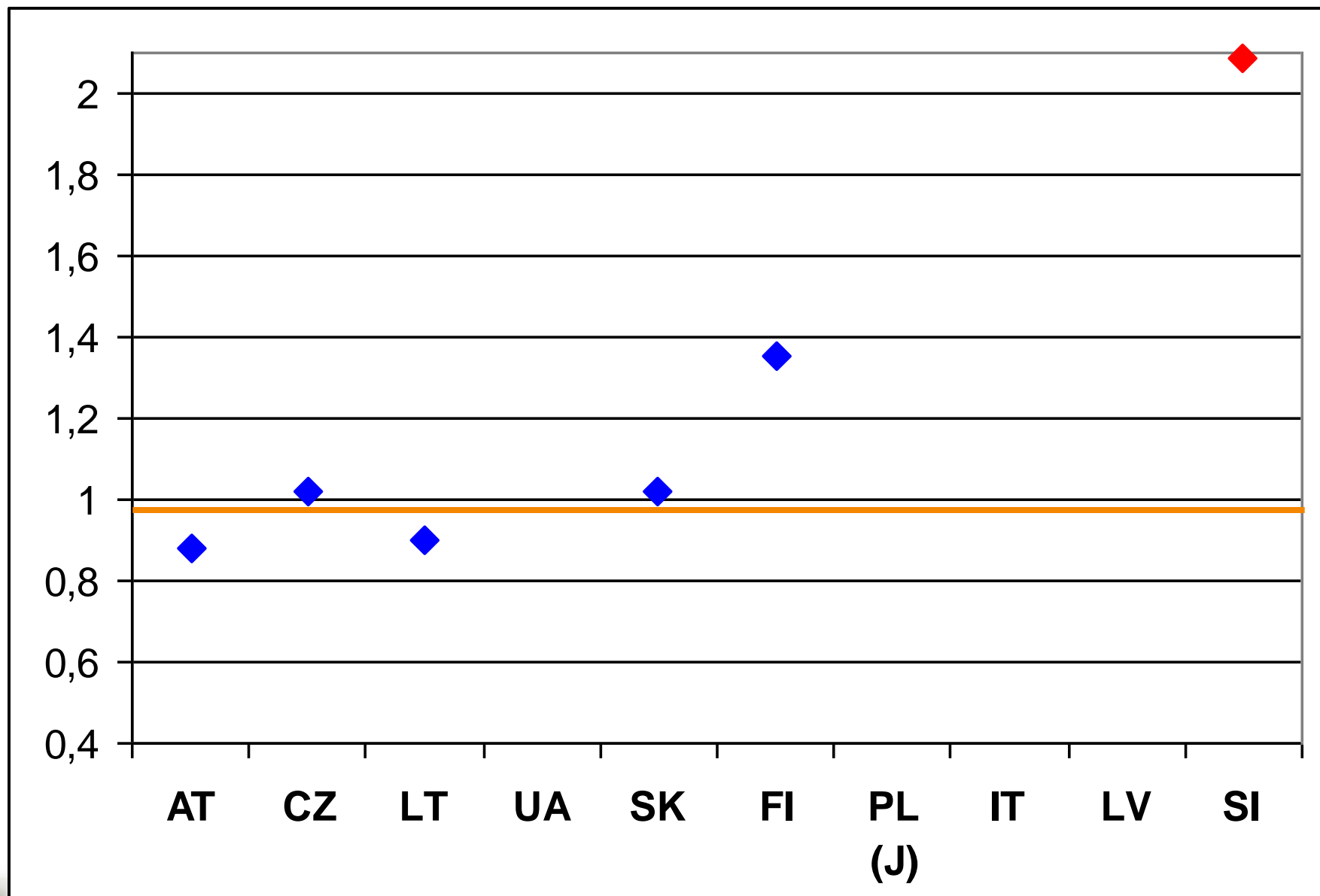
Juniors



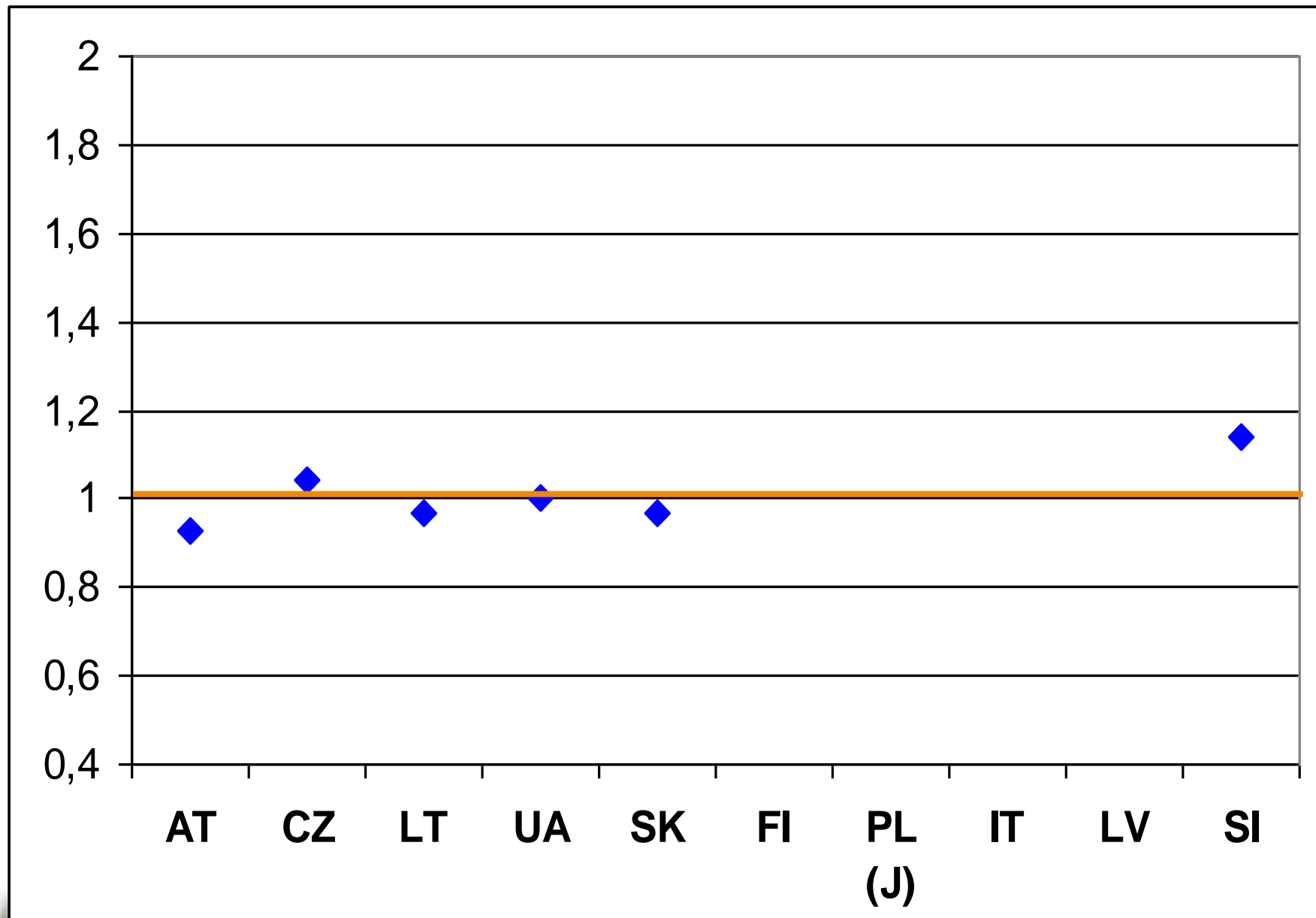
Seniors



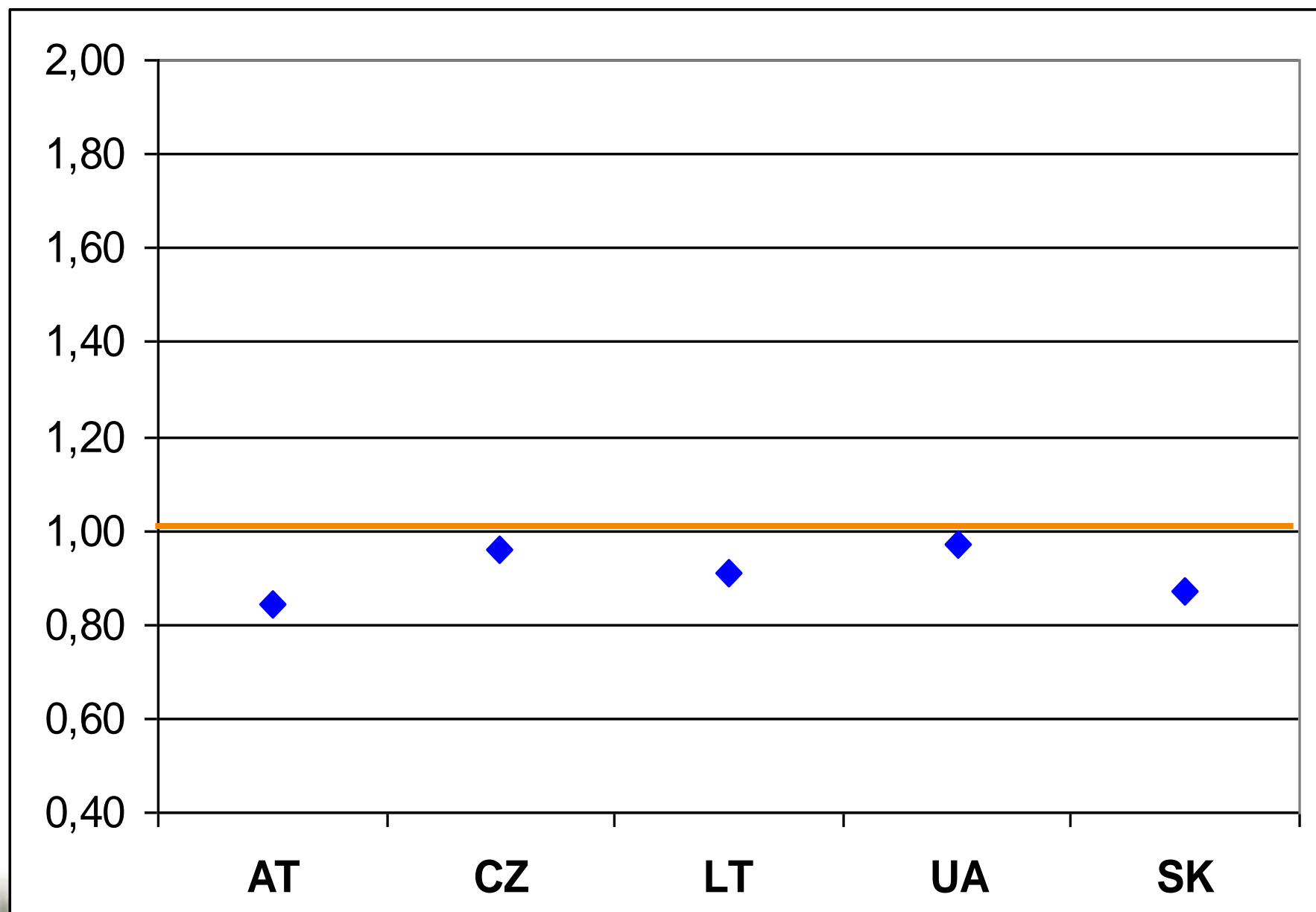
Benjamins (Best performance of girls)



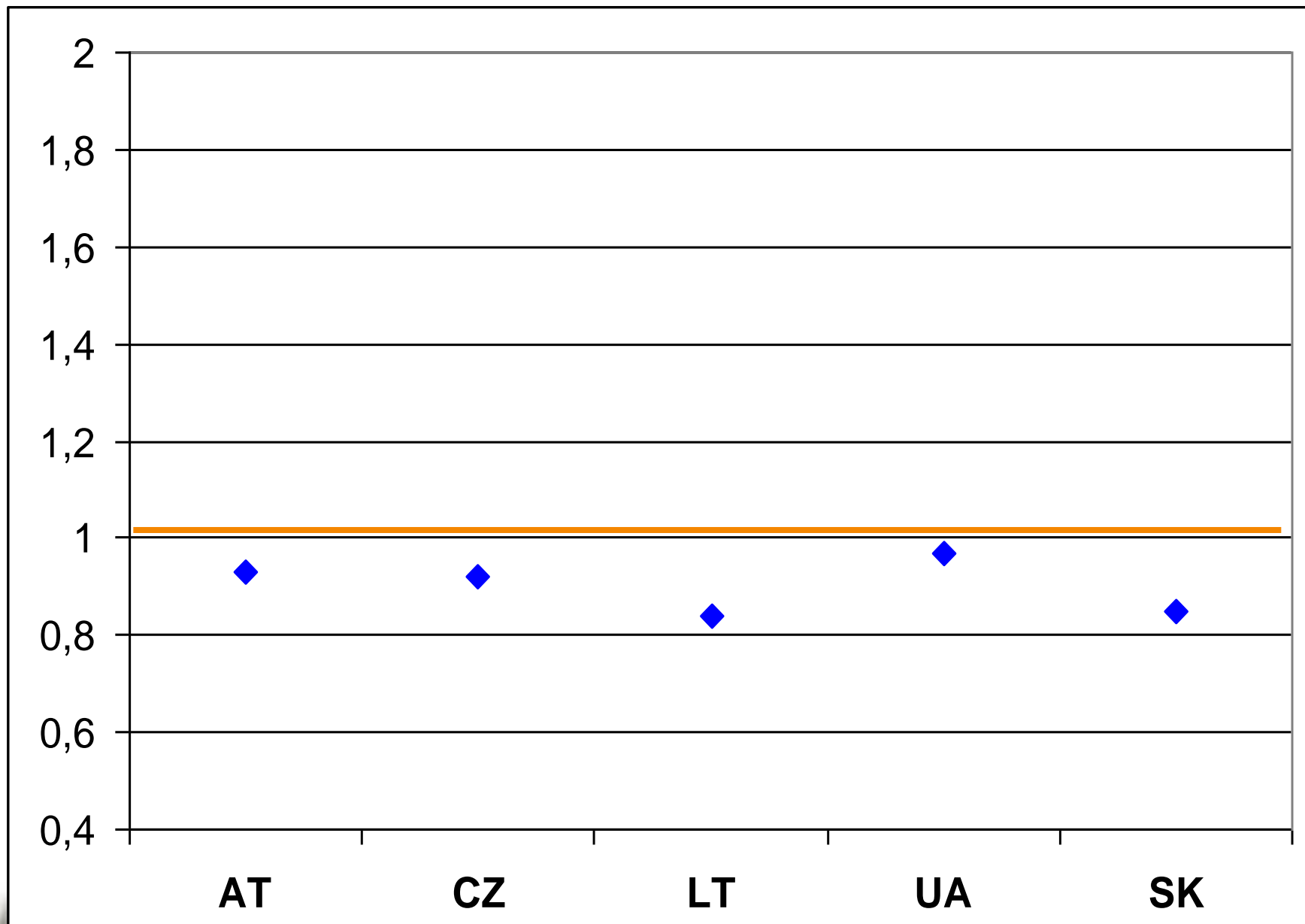
Cadets



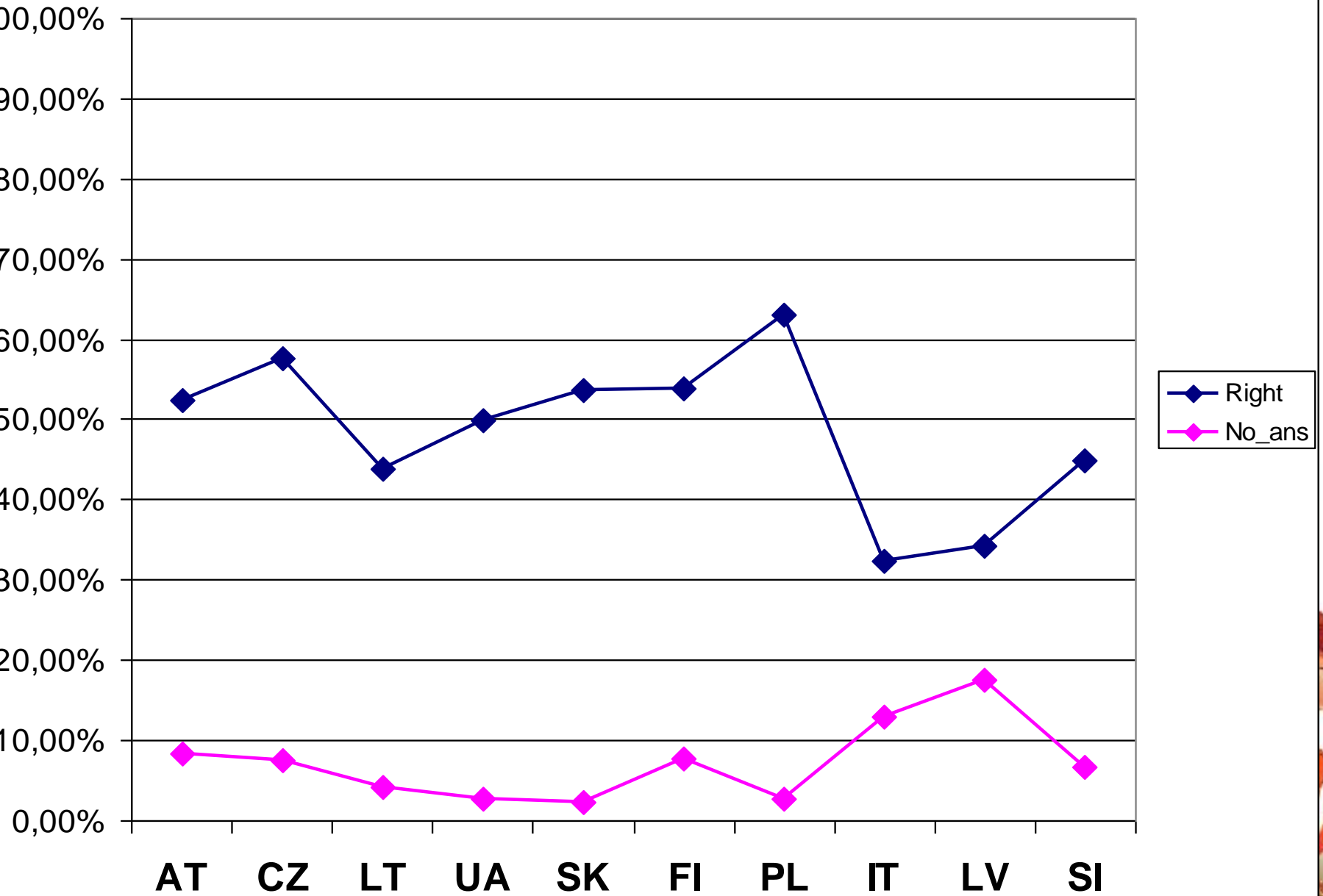
Juniors



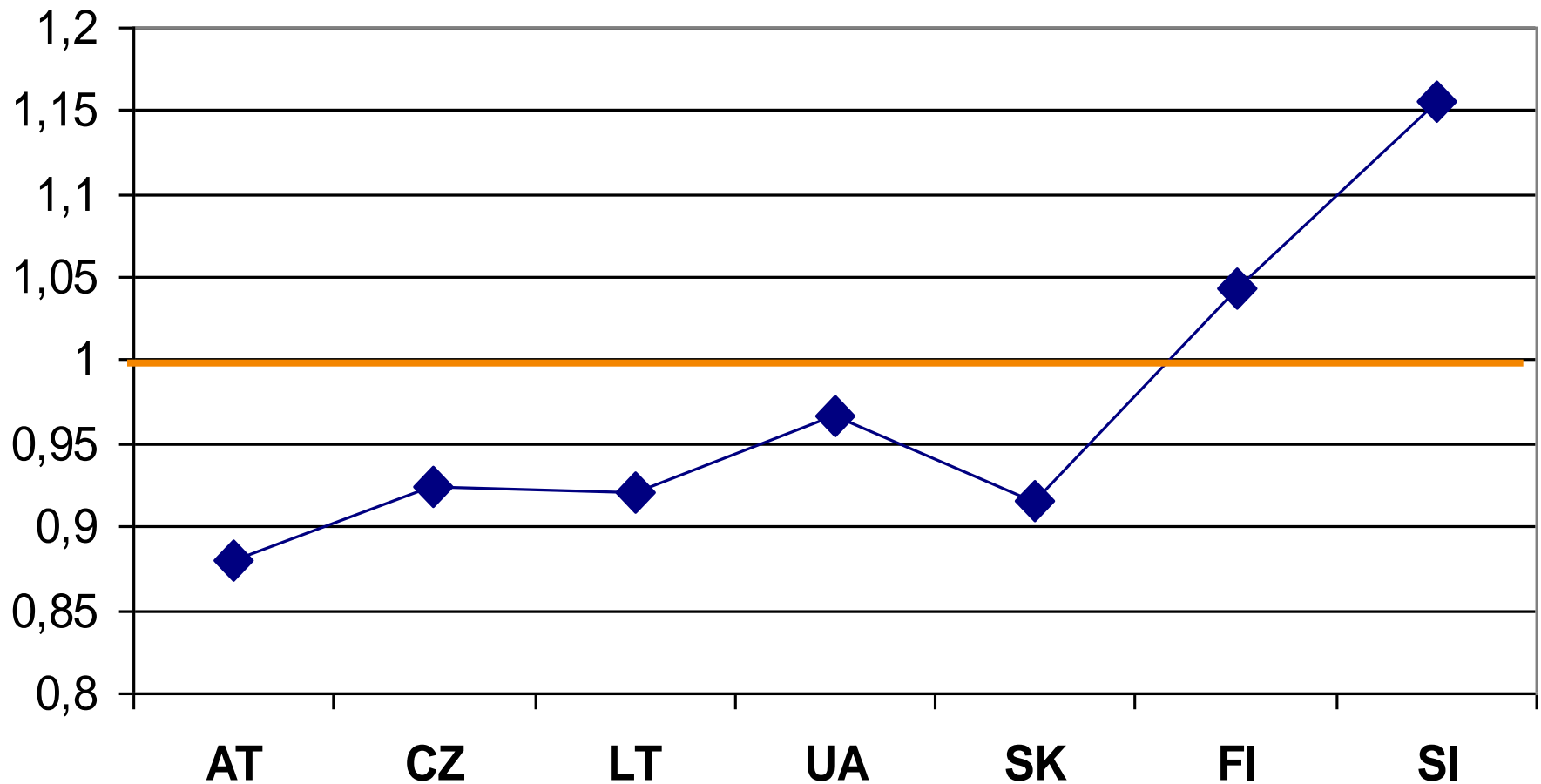
Seniors



Countries

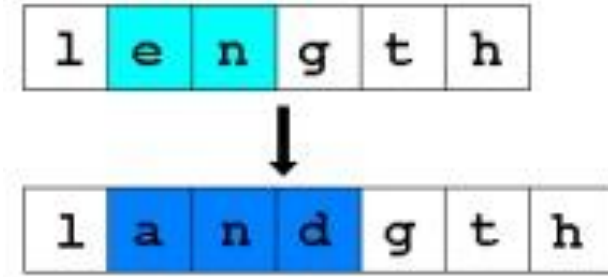


Countries (Girls/Boys)

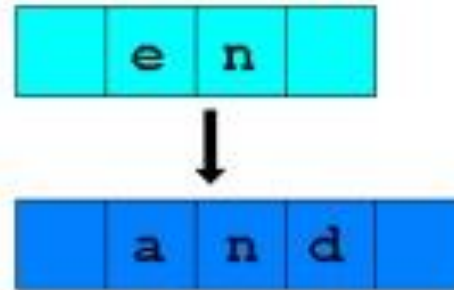
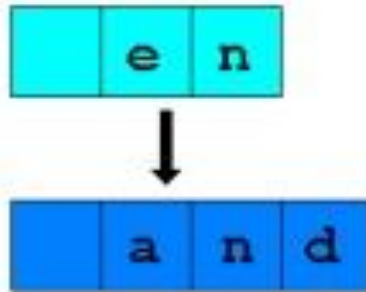
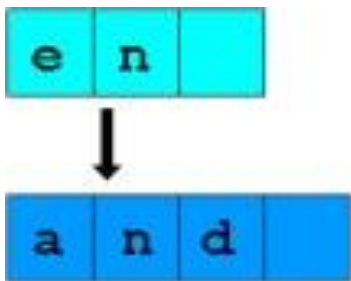


Search and Replace

Beaver has typed a text in English in the computer. Unfortunately he has made a mistake: instead of typing the English word "and" he has typed the Dutch translation "en" of this word. Beaver wants to correct his mistake by using the search and replace option of his program. He has to be careful, because just replacing the string "en" by "and" can cause damage in his text. For instance, "length" will be replaced by "landgth".



In which of the following cases all instances of the word "en" will correctly be replaced by "and" without any collateral damage on other words? Mind the spaces in the possible answers!



**Pakeisti
nejmanoma**



Search and Replace

Hardest task ever :)

Seniors (easy):

Right: **23,1%**.

Wrong: 70,54%.

No ans.: 6,36%

Juniors (easy) :

Right: **19,76%**.

Wrong: 76,61%.

No ans.: 3,64%

Cadets (easy) :

Right: **23,59%**.

Wrong : 71,54%.

No ans. : 4,87%

Benjamins (easy) :

Right: **20,07%**.

Wrong : 77,11%.

No ans.: 2,82%



■ V-VI
■ VII-VIII
■ IX-X
■ XI-XII

Thank you for the attention :)

Suggestions for the next year
statistical analysis and
representation

