

**General template to build a detailed
sheet for each puzzle and problems
treated by cMinds**

The problem

Title of the problem: **Robot's mathematical confusion**

//Long description of the problem. Be as detailed as possible.

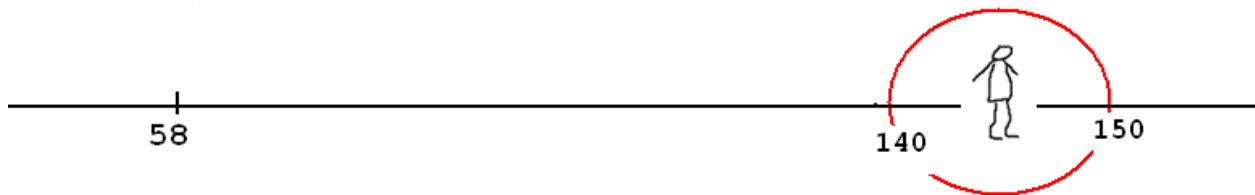
LEVEL 1

Robot feels lost in the number line. Help the robot move from 58 to the indicated zone (140- 150). It can only move 100, 50 and 10 steps forward and backward. Robot is waiting for your instructions. Try to use as less orders as possible.

INITIAL STATE



DESIRED OUTCOME- INITIAL STATE



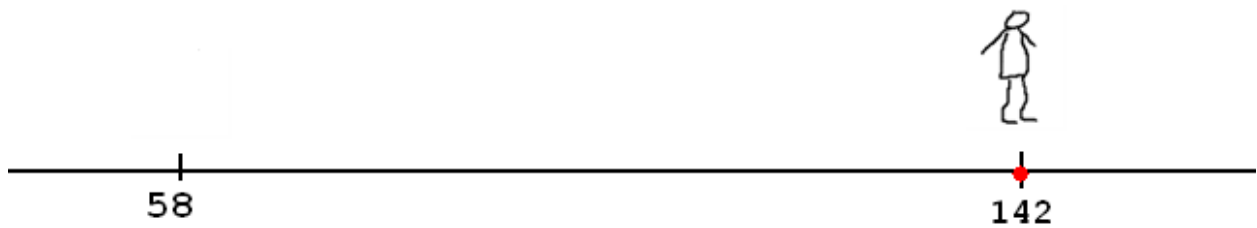
LEVEL 2

Robot feels lost in the number line the number line. Help the robot move from 58 to 142. Bear in mind that robot can only move 100, 50, 10, 5, 1 steps forward and backward. Robot is waiting for your instructions. Try to use as less orders as possible.

INITIAL STATE



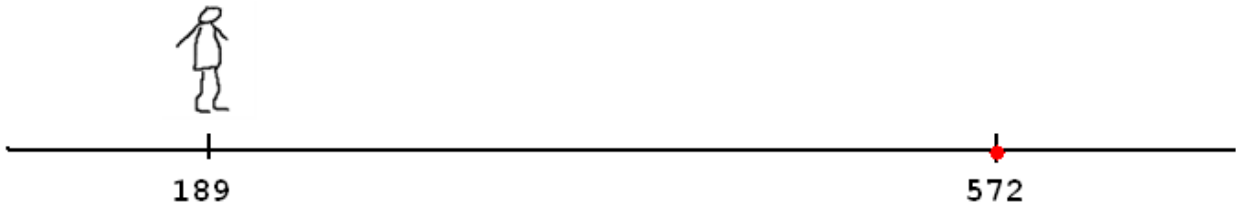
DESIRED OUTCOME- FINAL STATE



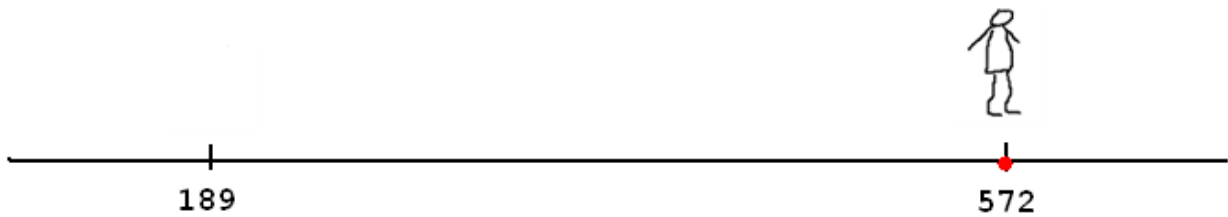
LEVEL 3

Robot feels lost in the number line. Help the robot move from 189 to 572. Bear in mind that robot can only move 100, 50, 10, 5 and 1 steps forward and backward. Robot is waiting for your instructions. Try to use as less orders as possible.

INITIAL STATE



DESIRED OUTCOME - FINAL STATE



LEVEL 4

Robot feels lost in the number line. Help the robot move from 1589 to 2623. Bear in mind that robot can only move 1000, 500, 100, 50, 10, 5 and 1 steps forward and backward. Robot is waiting for your instructions. Try to use as less orders as possible.

INITIAL STATE



DESIRED OUTCOME - FINAL STATE



LEVEL 5

Robot feels lost in the number line. Help the robot move from 4,5 to 105,5. Bear in mind that robot can only move 100, 50, 10, 5 and 1 steps forward and backward. Robot is waiting for your instructions. Try to use as less orders as possible.

INITIAL STATE



DESIRED OUTCOME - FINAL STATE



Data

//All the numerical parameters of the problem.

LEVEL 1

Initial state: 58

Final state: 140- 150

Number of steps the robot needs to do: $82 < \text{steps} \leq 92$

Available jumps: 100, 50, 10 (back and forth) meaning: 100, -100, 50, -50, 10, -10

1 robot , 1 number line

LEVEL 2

Initial state: 58

Final state: 142

Available jumps: 100, 50, 10, 5, 1 (back and forth) meaning: 100, -100, 50, -50, 10, -10, 5, -5, 1, -1

1 robot , 1 number line

LEVEL 3

Initial state: 189

Final state: 572

Available jumps: 100, 50, 10, 5, 1 (back and forth) meaning: 100, -100, 50, -50, 10, -10, 5, -5, 1, -1

1 robot , 1 number line

LEVEL 4

Initial state: 1589

Final state: 2623

Available jumps: 1000, 500, 100, 50, 10, 5, 1 (back and forth) meaning: 1000, -1000, 500, -500, 100, -100, 50, -50, 10, -10, 5, -5, 1, -1

1 robot , 1 number line

LEVEL 5

Initial state: 4,5

Final state: 105,5

Available jumps: 100, 50, 10, 5, 1 (back and forth) meaning: 100, -100, 50, -50, 10, -10, 5, -5, 1, -1

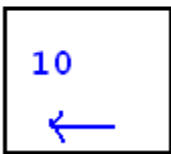
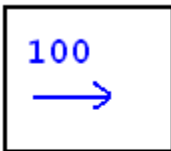
1 robot , 1 number line

Solution

We need to describe here the most ideal solution for the problem, both with a simple algorithm and with a graphical solution

LEVEL 1

1. Graphical



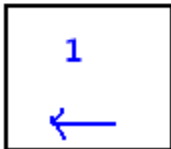
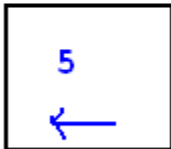
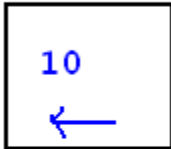
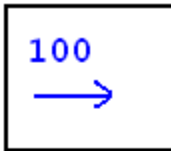
2. Algorithmic - Pseudocode

Jump 100 ;

Jump -10 ;

LEVEL 2

3. Graphical



4. Algorithmic - Pseudocode

Jump 100;

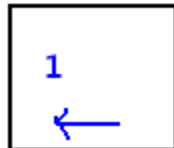
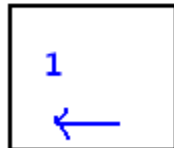
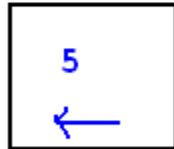
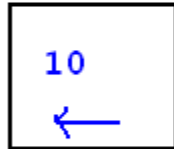
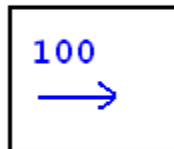
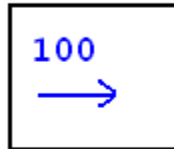
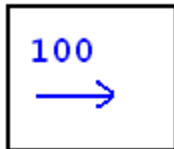
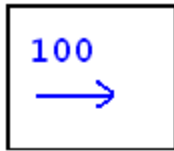
Jump -10;

Jump -5;

Jump -1;

LEVEL 3

5. Graphical



6. Algorithmic - Pseudocode

Jump 100;

Jump 100;

Jump 100;

Jump 100;

Jump -10;

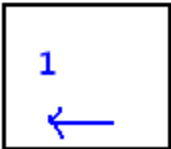
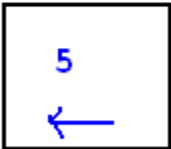
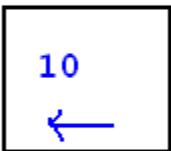
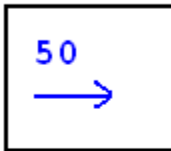
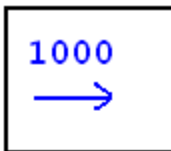
Jump -5;

Jump -1;

Jump -1;

LEVEL 4

7. Graphical



8. Algorithmic

Jump 1000;

Jump 50;

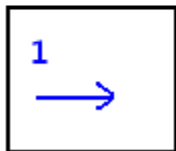
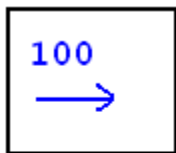
Jump -10;

Jump -5;

Jump -1;

LEVEL 5

9. Graphical



10. Algorithmic

Jump 100;

Jump 1;

List of needed assets (aka talking about the assets)

//Now that we have a solution, we can describe different scenarios (of course not all of them) requiring different assets. This will give us all the assets we need. We need to keep it as simple as possible. It is a list of all the assets used in the result zone and all their possible variations.

A. Action

- A1. Jump 1000 steps forward
- A2. Jump 1000 steps backwards
- A3. Jump 500 steps forward
- A4. Jump 500 steps backwards
- A5. Jump 100 steps forward
- A6. Jump 100 steps backwards
- A7. Jump 50 steps forward
- A8. Jump 50 steps backwards
- A9. Jump 10 steps forward
- A10. Jump 10 steps backwards
- A11. Jump 5 steps forward
- A12. Jump 5 steps backwards
- A13. Jump 1 step forward
- A14. Jump 1 step backwards

B. Tests

NO TESTS

C. Code

SIMPLE INSTRUCTIONS

D. Result zone general purpose assets

- D1. Robot is still looking right
- D2. Robot is jumping with right orientation
- D3. Robot is walking with right orientation
- D4. Robot is still looking with left orientation
- D5. Robot is jumping with left orientation
- D6. Robot is walking with left orientation

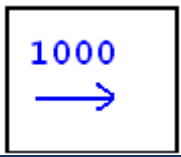
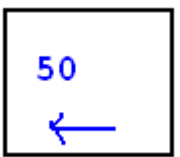
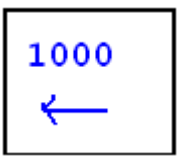
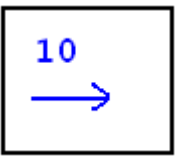
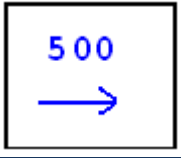
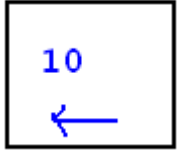
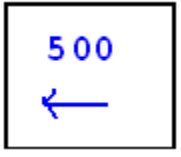
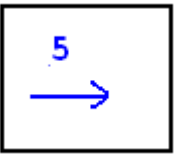
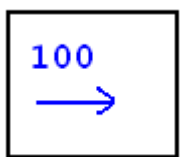

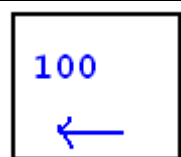
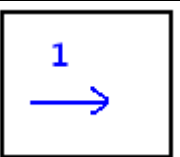
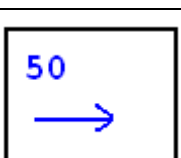
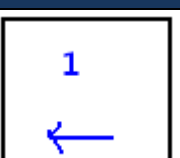
- D7. Robot is on 58
- D8. Robot is on 142
- D9. Robot is on 189
- D10. Robot is on 572
- D11. Robot is on 1589
- D12. Robot is on 2623
- D13. Robot is on 4,5
- D14. Robot is on 105,5
- D15. Robot is on the zone 140- 150

Visualization (aka drawing the assets)

Nothing more than a drawing of an asset and a number which will be used throughout this document.


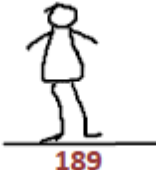










1. Action


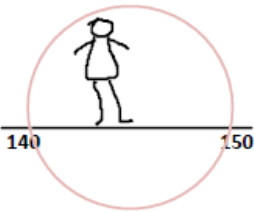

//All the assets which will be available in the action toolbox.

	A1		A8
	A2		A9
	A3		A10
	A4		A11
	A5		A12
	A6		A13
	A7		A14

2. General purpose

//Here we have all the new assets which will be used in the result zone.

	D1			D9
	D2			D10
	D3			D11
	D4			D12
	D5			D13
	D6			D14

	D7		D15
	D8		