

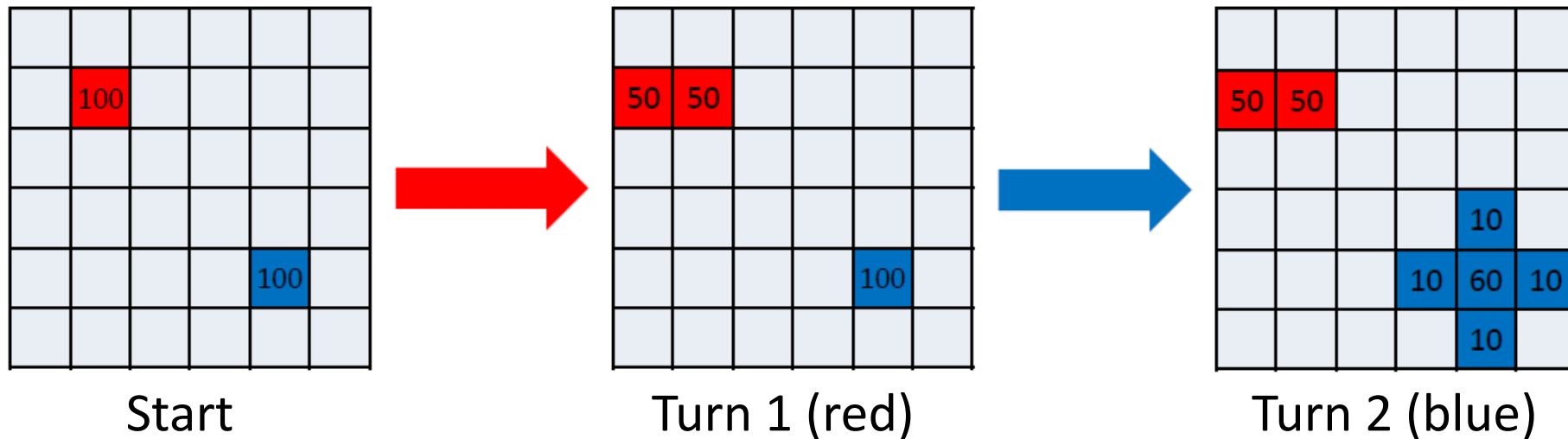
Grid Wars

A Game AI Coding Competition

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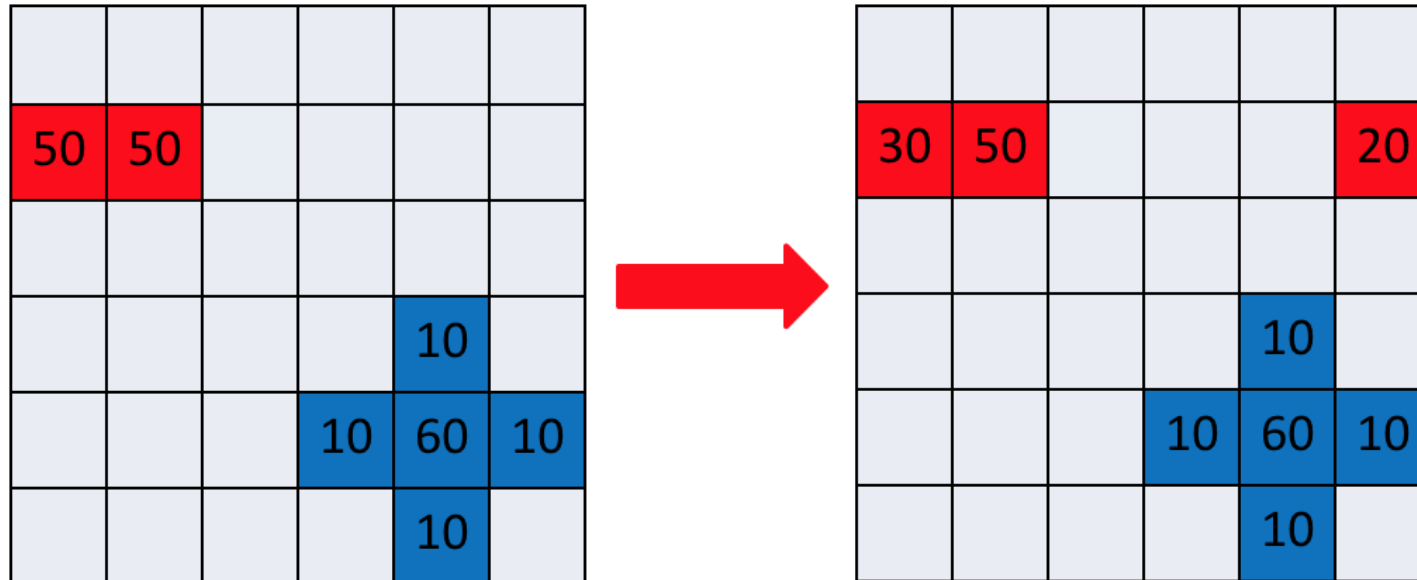
Game Setup

- Universe: 50x50 cells board
- 1vs1 matches between 2 bots
- Bots start at a random cell with 100 units (population)
- Bots take alternating turns to move units (2 turns = 1 round)
 - On each turn the player should provide a list of valid move commands



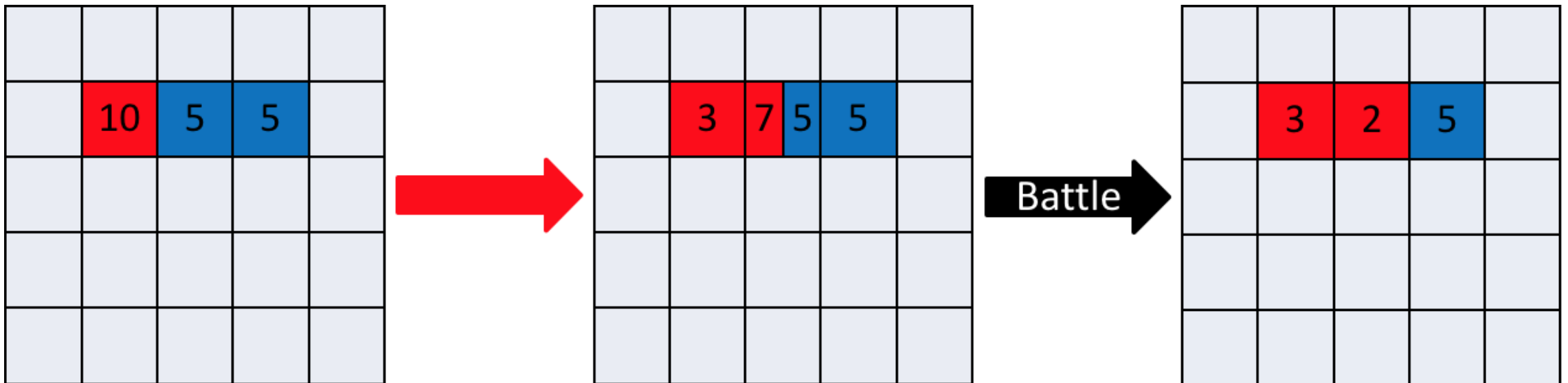
Movements

- Units can be moved into directly neighbouring cells
- Up, down, left, right (no diagonals)
- The board is a torus (the edges wrap around)
- You can move into your own cells, the population will be merged



Battle

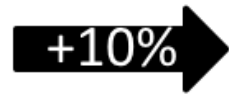
- If two bots meet in a cell? Fight!
- Simple comparison (more units will win)
- Surviving units = attacking – defending units (can result in 0)
- Battles occur after every turn (not round)



Population Growth

- After every round (2 turns = one turn per bot)
- Population increased by 10% (growth rate)
- Rounding to nearest integer (e.g. 4.4 = 4, 5.5 = 6)
- Maximum population per cell = 100

3	5				2
				1	
			1	6	1
				1	

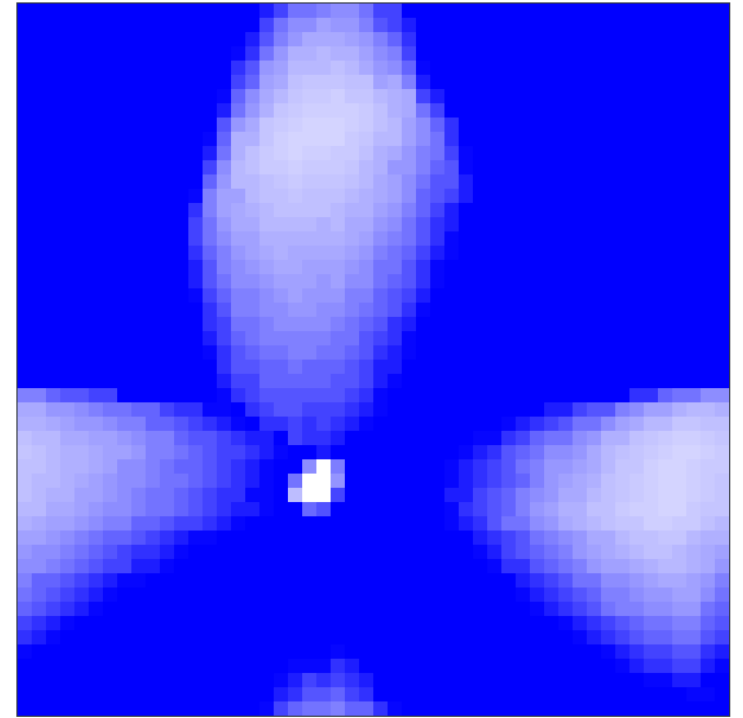
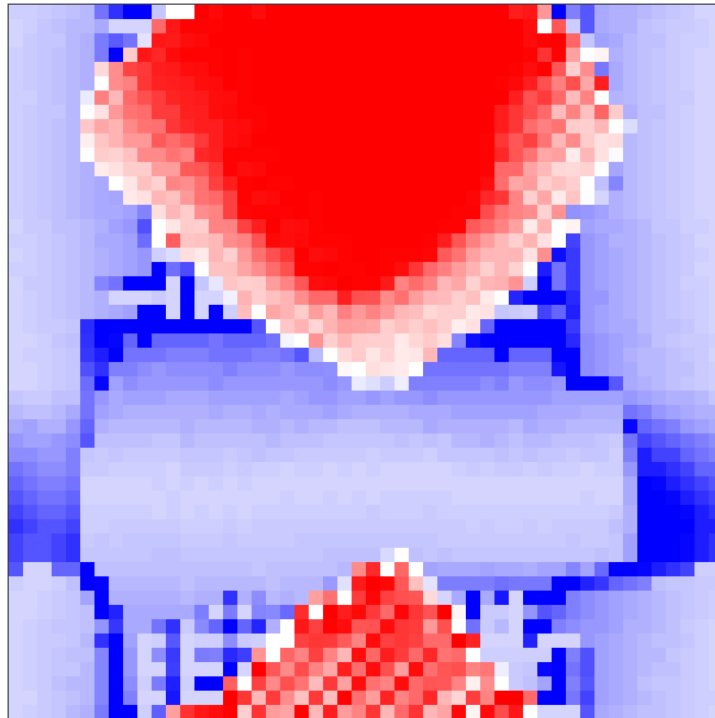
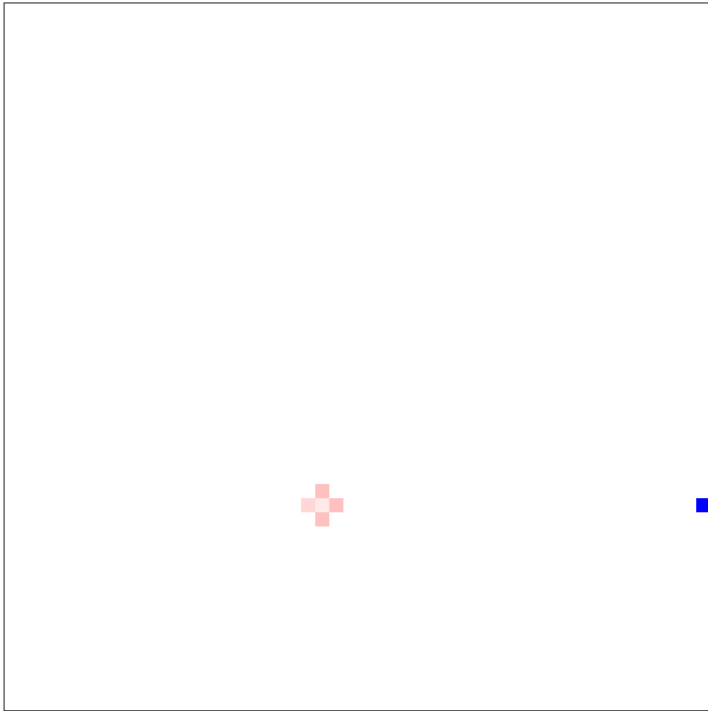


3	6				2
				1	
			1	7	1
				1	

Before	+10%	After
1	1.1	1
2	2.2	2
3	3.3	3
4	4.4	4
5	5.5	6

Winner

- Last surviving bot
- Or highest total population after 2000 rounds



Coding Competition

- Form small teams or go solo
- Register on the GridWars game server: <https://gridwars.app.cern.ch/>
 - 1 user account per team
 - Registration password: **CERN-DIT-2024**
 - Please provide a valid e-mail address
- Develop your bot locally and upload it to compete against the bots of other teams

Bot Development

- Getting Started guide: <https://gridwars.app.cern.ch/docs/getting-started>
- Programming language: Java 11
<https://adoptium.net/temurin/releases?version=11>
- Bots are packaged and uploaded as Java jar files
- Server will generate and play matches against all other bots on upload
- Only one active bot per team at a time
 - You can upload new versions your bot as often as you want
- Final bot upload deadline and playoffs at the end of the competition

Bot Development

- Do I need awesome programming skills?
 - Basic programming knowledge is enough
 - Simple examples are provided
 - Opportunity to learn
- What if I can't program at all?
 - Find team with someone who knows how to
 - Programming is only one part, it's also important to come up with a good strategy and algorithms, can also be done with pen & paper

Bot Development

Demo

Some more rules

- Illegal move = all moves for the turn are ignored
- Timeout on bot initialisation (3s)
 - If the bot fails to initialise in time, it will idle for the whole match.
- Timeout getting the next moves for a turn (50ms)
 - All moves added after the timeout are ignored
- Stateful bots are allowed
- Use of 3rd party libraries is **not** allowed
- Java reflection & file access etc. is **not** allowed
- More infos in the FAQ: <https://gridwars.app.cern.ch/docs/getting-started>

Schedule

When	What
Today, after the talk	Registrations will open
Tuesday, 16h30 – 17h45	Hackathon – Session 1
Wednesday, 18h15 – 19h15	Hackathon – Session 2
Thursday, aft`er lunch time	Closing of bot upload, playoffs
Thursday, evening	Results & prize ceremony

Questions?

- Talk to me
- Join the hackathon
- grid.wars@cern.ch



Register here