Programming challenge - 2024

International High-Performance Computing Summer School

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EPCC

July 8, 2024

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- These slides will be available on the moodle.

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  - **Maps**: cities are vertices, roads are edges.
  - **Social networks**: individuals are vertices, connections are edges.
  - **World wide web**: webpages are vertices, links between pages are edges.

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- Evaluates the popularity of webpages.
- Uses the number of links pointing to a page as a metric of popularity.
- Critical to the development of Google.

Algorithm

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- Every iteration, each webpage gives an equal amount of its influence to each page it points to, and, conversely, receives influence from other webpages.
- Proportion of the pagerank value allocated to the links moderated by a damping factor.

Termination condition

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- Can run until a certain number of iterations is reached

Termination condition

- Can run until convergence
- Can run until a certain number of iterations is reached
- Can run until an certain amount of time is elapsed

Your mission

The objective:
Complete as many iterations as possible in that time.

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Awards	Trophees for the winning team.

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- Can come and discuss about it at any lunch break.
- Even if you do not submit, it is a good opportunity to get some experience on a small HPC project.
- Good idea to mix with the other track:
  - Without someone from track 2, you are stuck to a single node.
  - Without someone from track 1, you are stuck to a single core.

Competitiveness

- Source code with biggest performance improvement wins.

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- If draw in performance, the **earliest** submission wins.

Guidelines for submissions

- Teams of 3 students maximum (1 minimum).

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- Can submit **as many times** as you want, before the deadline.
- Simply **email me** a zipped version of your folder, and the list of team members.

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- This ensures that everybody participates in the same conditions.

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- These slides are available on the moodle, in the programming challenge folder.
- It is possible adjustments or hotfixes be needed at some point, keep an eye on the repository and slack channel for updates.
- If you have a question or are stuck, **do not stay alone** in your corner, check with other students, ask staff members :)

Adjustments in 2024

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- Wish I had participated, but didn't know where to start

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- How to find other people when alone

Adjustments in 2024

- Wish I had participated, but didn't know where to start
  - Made less competition-looking in the past
  - Allocated a session on Thursday just for it
- How to find other people when alone
  - Send me an email on Tuesday midday.

How did I know about this?

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You can help us

Your feedback will also help the 2025 iteration address limitations you may observe.

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Behind the scenes

Name	Owner	Last modified
1.0 September 21, 2022	Jay Alameda	26 Sept 2022 me
2.0 October 5, 2022	Jay Alameda	5 Oct 2022 me
3.0 October 19, 2022	Jay Alameda	21 Oct 2022 me
4.0 November 2, 2022	Jay Alameda	2 Nov 2022 Jay Alameda
5.0 November 15, 2022	Jay Alameda	15 Nov 2022 Jay Alameda
6.0 November 30, 2022	Jay Alameda	30 Nov 2022 Jay Alameda
7.0 December 7, 2022	Jay Alameda	9 Dec 2022 Jay Alameda
8.0 December 12, 2022	Jay Alameda	12 Dec 2022 Jay Alameda
9.0 January 11, 2023	Jay Alameda	11 Jan 2023 Jay Alameda
10.0 January 25, 2023	Jay Alameda	25 Jan 2023 Jay Alameda

Figure: Extract of the list of meetings held to make this IHPCSS possible.

Behind the scenes

Name	Owner	Last modified
10.0 January 25, 2023	Jay Alameda	25 Jan 2023 Jay Alameda
11.0 February 01, 2023	Jay Alameda	1 Feb 2023 Jay Alameda
12.0 February 15, 2023	Jay Alameda	15 Feb 2023 Jay Alameda
13.0 February 22, 2023	Jay Alameda	22 Feb 2023 Jay Alameda
14.0 March 01, 2023	Jay Alameda	1 Mar 2023 Jay Alameda
15.0 March 08, 2023	Jay Alameda	8 Mar 2023 Jay Alameda
16.0 March 22, 2023	Jay Alameda	22 Mar 2023 Jay Alameda
17.0 April 5, 2023	Jay Alameda	10 Apr 2023 Jay Alameda
18.0 April 26, 2023	Jay Alameda	26 Apr 2023 Jay Alameda
19.0 May 3, 2023	Jay Alameda	3 May 2023 Jay Alameda
20.0 May 10, 2023	Jay Alameda	10 May 2023 Jay Alameda

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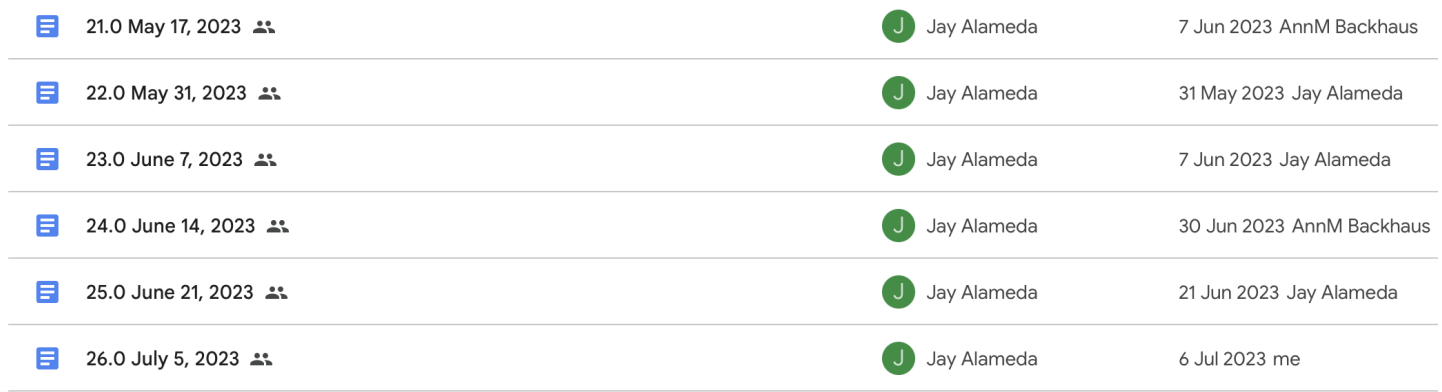
Behind the scenes



21.0 May 17, 2023	Jay Alameda	7 Jun 2023 AnnM Backhaus
22.0 May 31, 2023	Jay Alameda	31 May 2023 Jay Alameda
23.0 June 7, 2023	Jay Alameda	7 Jun 2023 Jay Alameda
24.0 June 14, 2023	Jay Alameda	30 Jun 2023 AnnM Backhaus
25.0 June 21, 2023	Jay Alameda	21 Jun 2023 Jay Alameda
26.0 July 5, 2023	Jay Alameda	6 Jul 2023 me

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Welcome!

Figure: List of the IHPCSS partners and participants.