

Data Structures

Project Allotment

Instructions :

1. Project Mentors are as follows :

- (1) Nadeem Moidu (nadeem.moiduug08@students.iiit.ac.in)
 - Parallel Merge, String Matching, External Mergesort, Randomized Quicksort
- (2) Aditya Deshpande (adity.deshapandeug08@students.iiit.ac.in)
 - Cuckoo Hashing, Bloom Filters, Locality Sensitive Hashing, All Sorting Projects
- (3) Sanjay Moulik (moulik.37@research.iiit.ac.in, PhD candidate @IIIT)
 - B/B+-Trees, Skip Lists, Segment/Interval Trees, Red-Black Trees
- (4) Dr. Kishore (kkishore@iiit.ac.in)
 - Parallel Graph Algorithms, Vitterbi Algorithm, Integer Data-Structures (VEB), Spanning Tree by Deletion of Edges

- 2. You should only contact the mentor of your project category for any specific doubts related to the projects. For other doubts, send a mail to Aditya.
- 3. A list of reference material for each project will be uploaded and you have to read it and implement (code) the project accordingly. The reference material will provide all the necessary information and in most cases you need not read any extra material.
- 4. There will be a mid-term evaluation sometime between 25th-30th March. The final evaluation will be in the 2nd Week of April. Exact details will be mailed in due course.
- 5. Every mentor will conduct introductory tutorials for their category of projects, which will help you get started. Do attend these without fail.

Allotment Details :

1. B-tree/B+-tree (B/B+ Vs. AVL/BST/Hash/Universal Hashing -- 8 variants)

* 8 Projects, one of B-tree/B+-tree vs. Rest *

Team#1 : B-Tree vs. BST

- (1) Alok Thatikunta alok.t@students.iiit.ac.in
- (2) Jayanth Katuri jayanth.katuri@students.iiit.ac.in

Team#2 : B-Tree vs. AVL

- (1) Shikher Somal shikherpratapsingh.somal@students.iiit.ac.in
- (2) Jaspreet Singh jaspreet.singh@students.iiit.ac.in

Team#3 : B-Tree vs. Hash

- (1) Abhishek ashok bhat abhishek.bhat@students.iiit.ac.in
- (2) Bhumik Shah bhumik.shah@students.iiit.ac.in

Team#4 : B-Tree vs. Univ. Hashing

- (1) Vanshika Srivastava vanshika.srivastava@students.iiit.ac.in
- (2) Akshita Negi akshita.negi@students.iiit.ac.in

Team#5 : B+ Tree vs. BST

- (1) AGNISNATO DATTA agnisnato.datta@students.iiit.ac.in
- (2) ABHISHEK AGARWAL abhishek.agarwal@students.iiit.ac.in

Team#6 : B+ Tree vs. AVL

- (1) Aditya Jindal aditya.jindal@students.iiit.ac.in
- (2) Darshan Agarwal darshan.agarwal@students.iiit.ac.in

Team#7 : B+ Tree vs. Hash

- (1) Kathera Rishi kathera.rishi@students.iiit.ac.in
- (2) Koteru Gopinath gopinath.koteru@students.iiit.ac.in

Team#8 : B+ Tree vs. Univ. Hashing

- (1) Sabuj Chattopadhyay sabuj.chattopadhyay@students.iiit.ac.in
- (2) Gaurav Singh g.singh@students.iiit.ac.in

Team#9 : B+-Tree vs AVL

- (1) Pankaj Malhotra pankaj.malhotra@students.iiit.ac.in
- (2) Aayush Saxena aayush.saxena@students.iiit.ac.in

Team#10 : B+-Tree vs. BST

- (1) Neha pande neha.pande@students.iiit.ac.in
- (2) Sneha kummetha kummetha.sneha@students.iiit.ac.in

Team#11 : B+-Tree vs. Hash

- (1) Ashish Kumar ashish.kumar@students.iiit.ac.in
- (2) Ayush Khandelwal ayush.khandelwal@students.iiit.ac.in

Team#12 B-Tree vs. BST

- (1) SAUMYA GURTU saumya.gurtu@students.iiit.ac.in
- (2) PRATYUSHA DANDA danda.prathyusha@students.iiit.ac.in

Team#13 B-Tree vs. AVL

- (1) shubham chhabra shubham.chhabra@students.iiit.ac.in
- (2) aditya jain aditya.jain@students.iiit.ac.in

2. String matching using KMP, BM -- failure function

* 2 projects, finally compared against each other *

Team#1 : KMP

- (1) Mohammed Faisal Anees mohammedfaisal.anees@students.iiit.ac.in
- (2) Machavarapu Hithesh Chowdary machavarapuhithesh.chowdary@students.iiit.ac.in

Team#2 : KMP

- (1) Sri Harsha Turlapati harsha.turlapati@students.iiit.ac.in
(2) Navneeth Sridharan navneeth.sridharan@students.iiit.ac.in

Team#3 : KMP

- (1) Akash Kant akash.kant@students.iiit.ac.in
(2) Mohit Bajaj mohit.bajaj@students.iiit.ac.in

Team#4 : KMP

- (1) Rishabh Sharma rishabh.sharma@students.iiit.ac.in

Team#3 : BM

- (1) Nazrul Haque Athar nazrul.athar@students.iiit.ac.in
(2) Rohit Sharma rohit.s@students.iiit.ac.in

Team#4 : BM

- (1) Prajeeth Emanuel Vethanayagam
prajeeth.vethanayagam@students.iiit.ac.in
(2) Venkat Arjun Yamarti arjun.yamarti@students.iiit.ac.in

3. Bloom filters (2 applications)

* 2 projects studying one application each *

Team#1

- (1) Rohan Bhatial rohan.bhatial@students.iiit.ac.in
(2) Bharat Lal Bhatnagar bharatlal.bhatnagar@students.iiit.ac.in

Team#2

- (1) Ajitesh Gupta ajitesh.gupta@students.iiit.ac.in
(2) Amit Kumar Jha amitkumar.jha@students.iiit.ac.in

Team#3

- (1) Udyan Khurana udyan.khurana@students.iiit.ac.in
(2) Gaurav Mishra gaurav.mishra@students.iiit.ac.in

Team#4

- (1) Madan Gopal Jhanwar madangopal.jhanwar@students.iiit.ac.in
(2) Saksham Singhal saksham.singhal@students.iiit.ac.in

Team#5

- (1) Rudhir Siddham rudhir.siddham@students.iiit.ac.in

4. Interval trees and segment trees (2 variants on applications)

* 2 projects studying one application each *

Team#1

- (1) RAJAT AGGARWAL rajat.aggarwal@students.iiit.ac.in
(2) SAKSHEE VIJAY sakshee.vijay@students.iiit.ac.in

Team#2

- (1) Yash Chamadia yash.chamadia@students.iiit.ac.in
(2) Lalit Kundu lalit.kundu@students.iiit.ac.in

Team#3

- (1) Karan Aggarwal karan.aggarwal@students.iiit.ac.in
(2) Mihir Wadwekar mihir.wadwekar@students.iiit.ac.in

Team#4

- (1) Rupinder Singh Khokhar rupindersingh.khokhar@students.iiit.ac.in
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Team#5

- (1) Aditya Chandran aditya.chandran@students.iiit.ac.in
- (2) Arvind Menon arvind.menon@students.iiit.ac.in

Team#6

- (1) Himangi Sarogi himangi.saraogi@students.iiit.ac.in

5. Integer data structures (VEB vs. BST/AVL/UHash/Hash)

* 4 projects, VEB (Van Emde Boas trees) compared with each of the four *

Team#1 VEB vs. BST

- (1) Manas Tewari manas.tewari@students.iiit.ac.in
- (2) Harish Krishna V harishkrishna.v@students.iiit.ac.in

Team#2 VEB vs. AVL

- (1) Devansh Shah devansh.shah@students.iiit.ac.in
- (2) Ankit Kotakankit kotak@students.iiit.ac.in

Team#3 VEB vs. Hashing

- (1) Saurabh Kathpalia saurabh.kathpalia@students.iiit.ac.in
- (2) Paritosh Garg paritosh.garg@students.iiit.ac.in

Team#4 VEB vs. Univ. Hashing

- (1) Gaurav Mohanty gaurav.mohanty@students.iiit.ac.in
- (2) Sriram Sachin Gudimella sriramsachin.gudimella@students.iiit.ac.in

Team#5 : VEB vs. BST

- (1) Mehtab Ahmed Khan mehtabahmed.khan@students.iiit.ac.in
- (2) Vrushank Vyas vrushank.vyas@students.iiit.ac.in

Team#6 : VEB vs. AVL

- (1) J V Ashrith ???
- (2) Thodupunuri Venkata Sai Nikhil
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Team#7: VEB vs. Hashing

- (1) GAYATRI NAIR gayatri.nair@students.iiit.ac.in
- (2) A K PUJITHA pujitha.ak@students.iiit.ac.in

6. Locality sensitive hashing (LSH vs. Range tree/kd/quad tree)

* 3 projects *

Team#1 : LSH vs. Range Tree

- (1) Junaid Ahmed junaid.ahmed@students.iiit.ac.in
- (2) Nirat Attri nirat.attri@students.iiit.ac.in

Team#2 : LSH vs. kd-Tree

- (1) Akshita Jha akshita.jha@students.iiit.ac.in
- (2) Preksha preksha.rajput@students.iiit.ac.in

Team#3 : LSH vs. quad tree

- (1) Abhirath Batra abhirath.batra@students.iiit.ac.in
(2) Abhijeet Thakur abhijeet.thakur@students.iiit.ac.in

Team#4 : LSH vs. Range Tree

- (1) G. vamshi krishna reddy gunnreedyvamshikrishna.reddy@students.iiit.ac.in
(2) G. sai vishwa teja gsaivishwa.teja@students.iiit.ac.in

Team#4 : LSH vs kd-Tree

- (1) Mayank Kumar mayank.kumar@students.iiit.ac.in
(2) Prateek Jain prateek.jain@students.iiit.ac.in

7. Cuckoo hashing (Vs. Hash/UHash/BST/AVL)

* 4 projects *

Team#1 Cuckoo Hashing vs. BST

- (1) Shipra Banga shipra.banga@students.iiit.ac.in
(2) Juhi Tandon juhi.tandon@students.iiit.ac.in

Team#2 Cuckoo Hashing vs. AVL

- (1) Anirudh Alampally alampally.anirudh@students.iiit.ac.in
(2) Sandeep Sricharan Mukku sandeep.mukku@students.iiit.ac.in

Team#3 Cuckoo Hashing vs. UHash

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Team#4 Cuckoo Hashing vs. Hash

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Team#5 Cuckoo Hashing vs. AVL

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Team#6 Cuckoo Hashing vs. Hash

- (1) Anudeep Kanneganti anudeep.kanneganti@students.iiit.ac.in
(2) Jeevan Chowdary Mandadapu jeevanchowdary.mandadapu@students.iiit.ac.in

Team#7 Cuckoo Hashing vs. BST

- (1) Vartika Rai vartika.rai@students.iiit.ac.in
(2) Sonali Goyal sonali.goyal@students.iiit.ac.in

Team#8 Cuckoo Hashing vs. UHash

- (1) Urvashi Senha urvashi.senha@students.iiit.ac.in
(2) G Drushti Apoorva drushti.g@students.iiit.ac.in

8. skip lists (vs. 5 variants BST/AVL/Hash/Btree/B+ tree)

* 5 projects *

Team#1 Skip Lists vs. BST

- (1) Arihant Gupta arihant.gupta@students.iiit.ac.in
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Team#2 Skip Lists vs. AVL

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Team#3 Skip Lists vs. Hash

- (1) Prithvi Reddy prithvi.reddy@students.iiit.ac.in
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Team#4 Skip Lists vs. B Tree

- (1) Chandu Sharvani sharvani.chandu@students.iiit.ac.in
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Team#5 Skip Lists vs. B+ Tree

- (1) Abhishek Gupta abhishek.gupta@students.iiit.ac.in
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Team#6 Skip Lists vs. AVL

- (1) Siddhant Prakash siddhant.prakash@students.iiit.ac.in
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Team#7 Skip Lists vs. BST

- (1) M Suresh Santhanam msuresh.santhanam@students.iiit.ac.in
(2) Saifulla Shaik saifulla.shaik@students.iiit.ac.in

Team#8 Skip Lists vs. B+-Tree

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(2) Kalpit Thakkar kalpit.thakkar@students.iiit.ac.in

Team#9 Skip Lists vs. B-Tree

- (1) Shubham Bansal shubham.bansal@students.iiit.ac.in
(2) Vivek Jain vivek.jain@students.iiit.ac.in

9. Red-Black tree (vs. AVL/BST/Hash/B/B+/skip list) -- 6

* 6 projects *

Team#1 : Red-Black Tree vs. BST

- (1) VARUN KUMAR REDDY PIRAKALA varun.pirakala@students.iiit.ac.in
(2) LAGISETTI UHITH lagiseti.uhith@students.iiit.ac.in

Team#2 : Red-Black Tree vs. AVL

- (1) Atharva Girish Wazurkar atharva.wazurkar@students.iiit.ac.in
(2) Vinit Garg vinit.garg@students.iiit.ac.in

Team#3 : Red-Black Tree vs. Hash

- (1) Snigdha Dagar snigdha.dagar@students.iiit.ac.in
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Team#4 : Red-Black Tree vs. B Tree

- (1) Divya Kukar divya.kukar@students.iiit.ac.in
(2) Nimish Sehgal nimish.sehgal@students.iiit.ac.in

Team#5 : Red-Black Tree vs. B+ Tree

- (1) Charvi charvi.sardana@students.iiit.ac.in
(2) Akhil akhil.chilukuri@students.iiit.ac.in

Team#6 : Red-Black Tree vs. Skip List

- (1) Aditya Chattopadhyay aditya.c@students.iiit.ac.in

(2) Sriranga Bharath Kota srirangabharath.kota@students.iiit.ac.in

Team#7 : Red-Black Tree vs. BST

(1) Srujai.Varikuti srujai.varikuti@students.iiit.ac.in
(2) Maneesh.T.S.V maneeshts.v@students.iiit.ac.in

Team#8 : Red-Black Tree vs. AVL

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Team#9 : Red-Black Tree vs. B-Tree

(1) Vikram Ahuja vikram.ahuja@students.iiit.ac.in
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Team#10 : Red-Black Tree vs. Hash

(1) DEREDDY AKHIL REDDY dereddyakhil.reddy@students.iiit.ac.in

10. Parallel merge algorithm -- $O(\log \log n)$ optimal and $O(\log n)$ optimal

* 2 projects *

Team#1

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(2) Umang Sharma umang.sharma@students.iiit.ac.in

Team#2

(1) S. Remya remya.s@students.iiit.ac.in
(2) Somya Mehdiratta ???

Team#3

(1) Payila Rama Dedeepya ramadedeepya.payila@students.iiit.ac.in
(2) Tejaswini Devanaboyina tejaswini.devanaboyina@students.iiit.ac.in

11. Quick sort analysis

Team#1

(1) gaurav parida gaurav.parida@students.iiit.ac.in
(2) akash agrawall akash.agrawall@students.iiit.ac.in

Team#2

(1) Aniruddh Kanojia aniruddh.kanojia@students.iiit.ac.in
(2) Shubham Rai shubham.rai@students.iiit.ac.in

Team#3

(1) Aarshvi Gajjar aarshvi.gajjar@students.iiit.ac.in

12. External merge sort

Team#1

(1) Sumant kovvuritejeswarsumant.reddy@students.iiit.ac.in
(2) Sunil sunil.dharmana@students.iiit.ac.in

Team#2

(1) M.Pradeep maripi.pradeep@students.iiit.ac.in
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Team#3

- (1) Priyanka Suresh priyanka.suresh@students.iiit.ac.in
- (2) Pranav Chintala pranav.chintala@students.iiit.ac.in

Team#4

- (1) kotlo sai sharan kotlosai.sharan@students.iiit.ac.in

13. Parallel graph algorithms -- SV, HC, APSP,

* 3 projects *

Team#1 : SV

- (1) Vignesh Prasad vignesh.prasad@students.iiit.ac.in
- (2) Abishek Kannan abishek.kannan@students.iiit.ac.in

Team#2 : HC

- (1) Arnav Kumar Agrawal arnavkumar.agrawal@students.iiit.ac.in
- (2) Akshay Jaggi akshay.jaggi@students.iiit.ac.in

Team#3 : APSP

- (1) Anubhav anubhav.srivastava@students.iiit.ac.in
- (2) Mohit Jain mohit.jain@students.iiit.ac.in

Team#4 : SV

- (1) pritam penumatsasaipritam.varma@students.iiit.ac.in
- (2) bhargav yimmidisetti.bhargav@students.iiit.ac.in

14. Viterbi algorithm and two application

* 2 projects *

Team#1

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- (2) sneha bandla sneha.bandla@students.iiit.ac.in

Team#2

- (1) Darpan Baheti darpan.baheti@students.iiit.ac.in
- (2) Devesh Agrawal devesh.agrawal@students.iiit.ac.in

Team#3

- (1) Nishant Prateek nishant.prateek@students.iiit.ac.in
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Team#4

- (1) Yalavarthi Rachana yalavarthi.rachana@students.iiit.ac.in
- (2) Anushka Kurra anushka.kurra@students.iiit.ac.in

15. spanning tree by deletion of edges (2 variants)

* 2 projects *

Team#1

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Team#2

- (1) Aditi Mavalankar aditi.mavalankar@students.iiit.ac.in
(2) Archit Agrawal archit.agrawal@students.iiit.ac.in

Team#3

- (1) Sravya Gurram sravya.gurram@students.iiit.ac.in
(2) Samyukta.D dSamyukta.dSamyukta@students.iiit.ac.in

Team#4

- (1) Avichal Dayal avichal.dayal@students.iiit.ac.in
(2) Nishant Agrawal nishant.agrawal@students.iiit.ac.in

Team#5

- (1) PULKIT AGARWAL pulkit.agarwal@students.iiit.ac.in
(2) PARTH VERMA parth.verma@students.iiit.ac.in

16. Various sorting algorithms (Sample sort/multi-way merge sort/library sort/Bitonic sort/odd-even sort)

* 10 projects * by comparing any two of the above.

Team#1 : Sample Sort vs. Multi-way merge

- (1) Kartik Kohli ???
(2) Rohita Darga rohita.darga@students.iiit.ac.in

Team#2 : Bitonic Sort vs. Odd Even Sort

- (1) Princu Jain princu.jain@gmail.com
(2) Meeraaj Patel meeraaj.patel@students.iiit.ac.in

Team#3 : Bitonic Sort vs. Multi-way merge

- (1) Achyuth Narayan sachyuth.narayan@students.iiit.ac.in
(2) abrar ahmed abrar.ahmed@students.iiit.ac.in

Team#4 : Sample Sort vs. Library Sort

- (1) Ayush Garg ayush.garg@students.iiit.ac.in
(2) Umang Goel umang.goel@students.iiit.ac.in

Team#5 : Library Sort vs. Multi-way merge

- (1) M Malavika Reddy malavika.m@students.iiit.ac.in
(2) Samyukta mogily samyukta.mogily@students.iiit.ac.in

Team#6 : Sample Sort vs. Bitonic Sort

- (1) srikar allu allu.srikar@students.iiit.ac.in
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Team#7 : Odd Even Sort vs. Multi-way merge

- (1) Arjit Srivastava arjit.srivastava@students.iiit.ac.in
(2) Yogesh Maheshwari yogesh.maheshwari@students.iiit.ac.in

Team#8 : Library Sort vs. Bitonic Sort

- (1) Phani Teja singamaneniphani.teja@students.iiit.ac.in
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Team#9 : Sample Sort vs. Library Sort

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(2) Poorna Teja Kilaru poornateja.kilaru@students.iiit.ac.in

Team#10 : Odd Even Sort vs. Library sort

- (1) Puneeth Raj Manyam puneethraj.manyam@students.iiit.ac.in
- (2) Mahesh Reddy Kukunooru maheshreddy.kukunooru@students.iiit.ac.in

Team#11 : Odd Even Sort vs. Sample Sort

- (1) Vihar M Patel vihar.patel@students.iiit.ac.in
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Team#12 : Bitonic Sort vs. Library Sort

- (1) Muralidhar Konda Muralidhar.konda@students.iiit.ac.in
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Team#13 : Sample Sort vs. Multi-way Merge

- (1) vimal chaudhary vimal.chaudhary@students.iiit.ac.in
- (2) prayank lalan prayank.lalan@students.iiit.ac.in

Team#14 : Library Sort vs. Odd-Even Sort

- (1) chaitanya basinachaitanyavisweswara.rao
- (2) sharan kotlosai.sharan@students.iiit.ac.in

Team#15 : Multi-way merge vs. Library Sort

- (1) Abhishek Agarwal abhishek.a@students.iiit.ac.in

Team#16 : Library Sort vs. Odd-Even Sort

- (1) Prathyusha Jwalapuram prathyusha.jwalapuram@students.iiit.ac.in

== Late Additions ==

- 1) Harsha Kapa = Bloom Filters
- 2) K.Chetan (201201124), G.Kamal (201201127) = Bitonic Sort vs. Library Sort
- 3) Sudarsh Rathi 201125172, Asif Hussain 201225086, Rudhir Siddham 201225195 = Bitonic Sort vs. Multi-way Merge Sort
- 4) ABHISHEK JAIN abhishek.j@students.iiit.ac.in
MOHIT DUBEY mohit.dubey@students.iiit.ac.in - B-tree vs BST