Mergesort and Search Experiments

Interim Presentation to CEMCA

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2021-05-27 Thu

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Contents

Objective of Project

1. **Goal:** Building Virtual Lab Experiments for Mergesort and Search related algorithms.

2. **Approach:** The experiments are to be *interactive* and are designed to demonstrate the gradual development of the algorithm.

3. **Items for delivery:** Requirements and design documents, source code, final report and demo.

Background discussion culimating in contract

1. **2020-11-19**: EoI from CEMCA for Virtual Labs in CS.

2. **2020-12-08**: Submission of proposal (1st draft)

3. **2021-01-04**: Submission of Concept Note (v3) and proposals for Workshops and Virtual Labs Development.

4. **2021-02-16**: Submission of signed contract

Delivery of work products

1. **2021-03-16**: Submission of requirement document. (Phase I)

2. **2021-04-12**: Submission of brochure on Algodynamics.

3. **2021-04-19**: Submission of Design Documents for Mergesort and Search experiments. (Phase II)

4. **2021-05-24**: Demo of Experiment Prototype to Dr. Shiffon Chatterjee. (Phase III)

5. **2021-06-15**: Product source code and final demo. (To be done.) (Phase IV)

Contents

Table 1: Experiments for Search

No.	Experiment Name
1	Random Search With Replacement
2	Random Search Without Replacement
3	Linear Search
4	Binary Search

Mergesort Experiments

Table 2: Experiments for Mergesort

No.	Experiment Name
1	Shuffle Experiment
2	Merge Strategy
3	Merge Algorithm
4	Merging Sublists
5	Recursive Mergesort
6	Arbitrary Merge-Sort

Contents

Work remaining to be done

1. Fix UI bugs

2. Improve the narrative against each experiment

3. Incorporate basic analytics

4. Host experiments and share source code

5. Write Final Report

Conclusion

1. We believe that teaching Computing must consist of the triumvirate of

   - Lectures to convey the scientific principles, models and reasoning methods.

   - Experiments to interactively solve computational problems and gain insight.

   - Programming Assignments to learn the skill of coding computational problems.

2. We have focussed on Experiments. Workshops could cover the other two.