ESTIMATIONS PROBLEMS AND RANDOMIZED GROUP ALGORITHMS

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LECTURE 1

- General introduction.
- Link between estimation and randomisation.
- Examples of algorithms requiring easily estimated proportions.
  - S_n Dixon's Theorem, Cannon's Algorithm.
  - S_n black box recognition.
- Interplay of estimating and powerful algorithms.
- SL recognition.
- ppd elements and classical recognition—NP and perhaps also the black box version of Babai, Seress et. al.

Slides:

`http://larmor.nuigalway.ie/~detinko/Cheryl_1.pdf`

LECTURE 2

- Estimation techniques in Permutation Groups.
  - Large cycle-small cycle trick.
  - Muenchhausen Method: look at cycles containing given points and insert crude first estimate into the next estimate.
  - Dividing into different sets.
  - Power series (work with Sukru).
- Algorithmic applications.

LECTURE 3

- Estimation techniques in finite classical groups.
  - Quokka theory.
  - p-abundant elements.

Slides:

`http://larmor.nuigalway.ie/~detinko/Cheryl_Alice_3.pdf`
`http://larmor.nuigalway.ie/~detinko/Cheryl_Alice_31.pdf`

LECTURE 4

- Pre-involutions; balanced involutions; better results with quokka theory than geometric arguments.
- What's the problem?
- Involutions and regular invertible elements in $GL(n, q)$.

Slides:

http://larmor.nuigalway.ie/~detinko/Cheryl_4.pdf

LECTURE 5

- Centralisers of involutions: Bray's trick.
- Classical generation by balanced involutions.

Slides:

http://larmor.nuigalway.ie/~detinko/Akos_5.pdf