Graph-Based Remerging of Genealogical Databases

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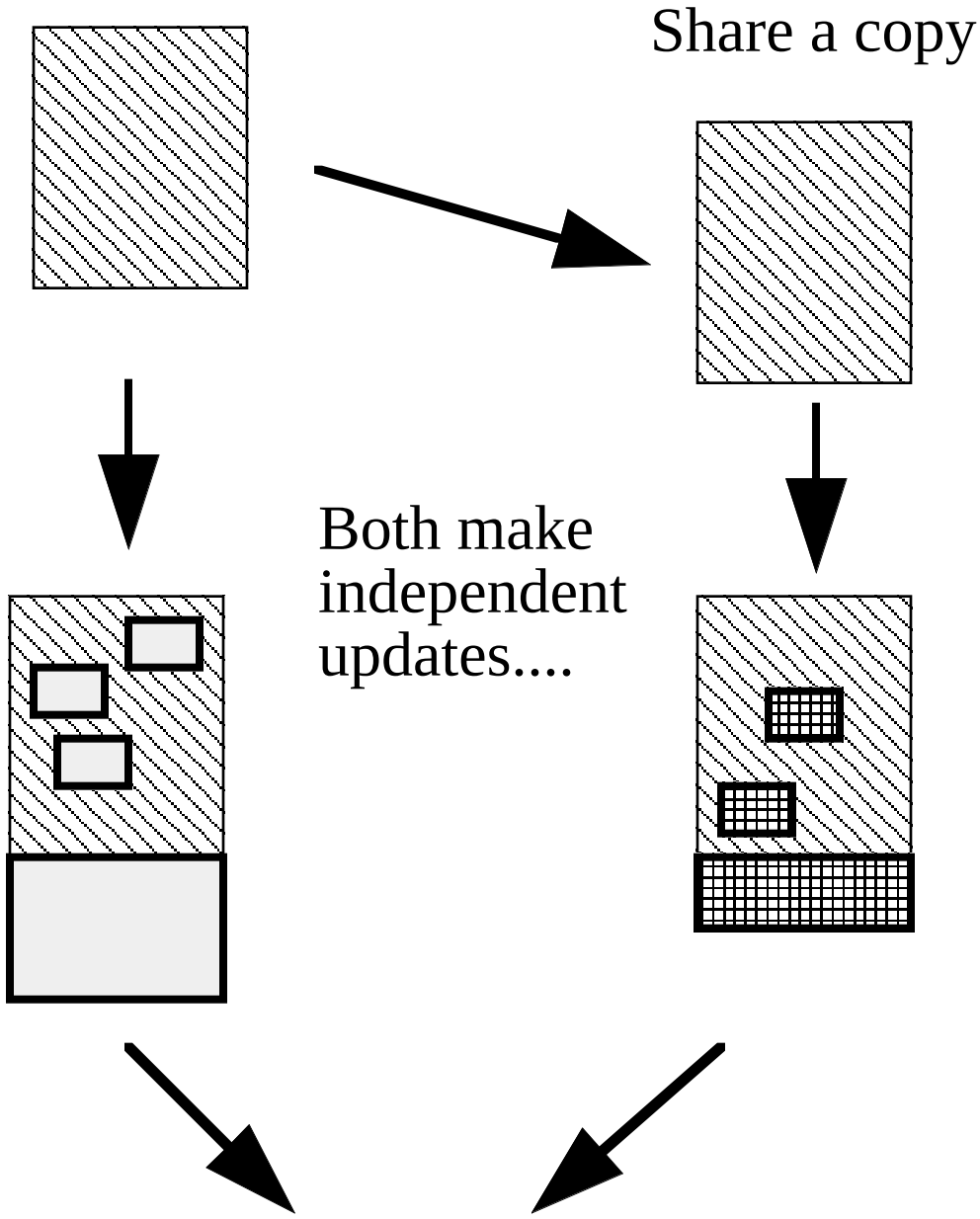
“Remerging” Problem

Original Database



Now what??

Common Approaches

- **Give up**
  - One person does everything, and everyone else is uninvolved; or
  - Everyone duplicates work for themselves.

- **Visual Inspection**, and hand-typing

- **Unix "diff" command**, and hand-typing

- **Match/Merge** function
  - Import second database into first
  - Decide which pairs of similar people should be merged back together

Time wasters :(

Better Solutions

- **Locking**
  - One person has *master* database
  - Others can "*check out*" portions

  [but overly restrictive]

- **Unique ID Numbers**
  - Program assigns unique ID numbers
  - ID numbers allow automatic match/merging of identical people.
  - *[but ID numbers may not survive translations to/from other software]*

- **Graph-Based Merging Algorithm**

Graph-Based Merging

- No need to check out (lock) portions of the database.
- No need for ID numbers
- No need to examine people who have not changed.
- Retroactive: Works on databases that have already diverged.

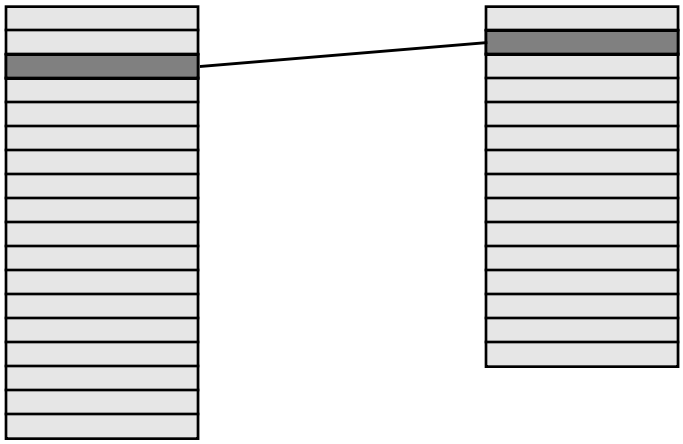
Merging Algorithm

I. Sort both databases

- Surname, given name
- Birth date, birth place
- Death date, death place
- ID numbers, if available

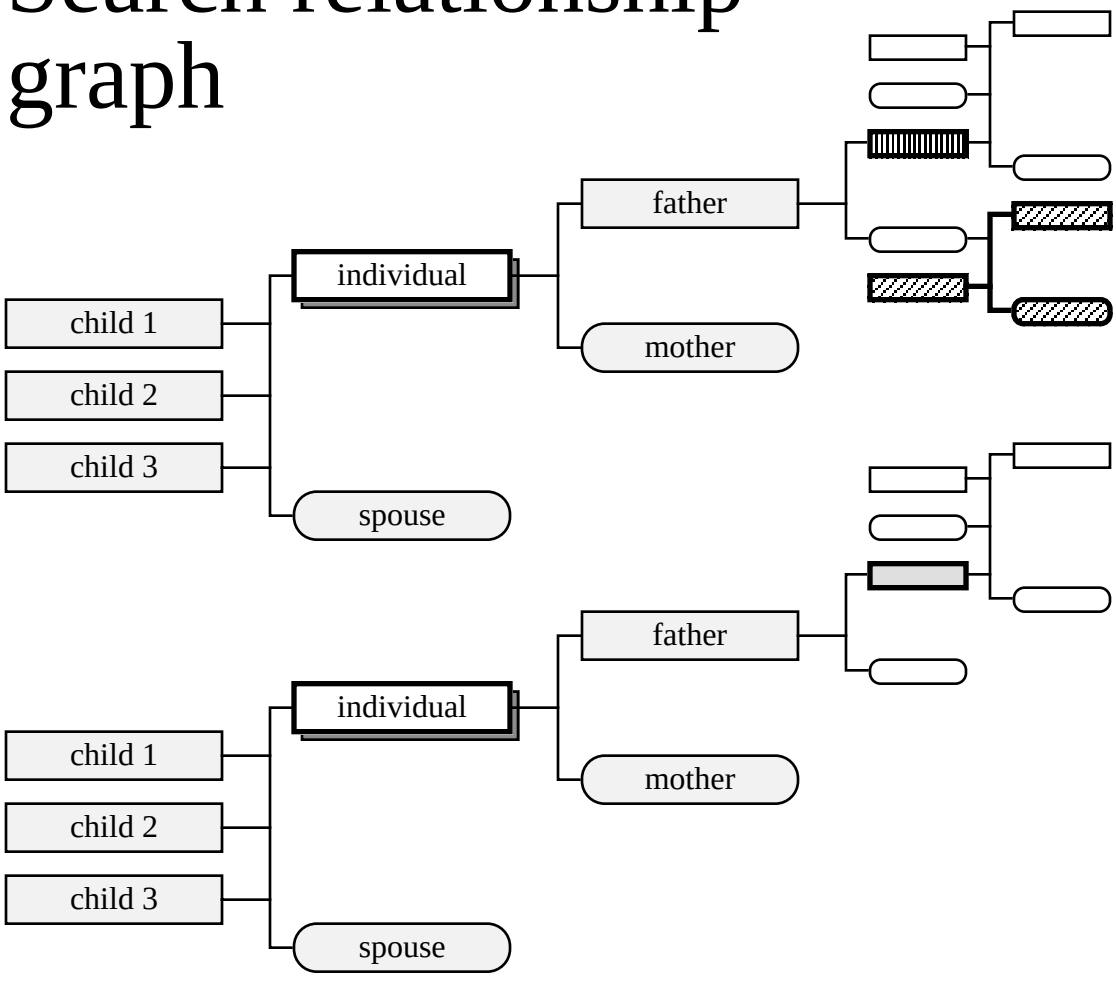
II. Find “matching” person

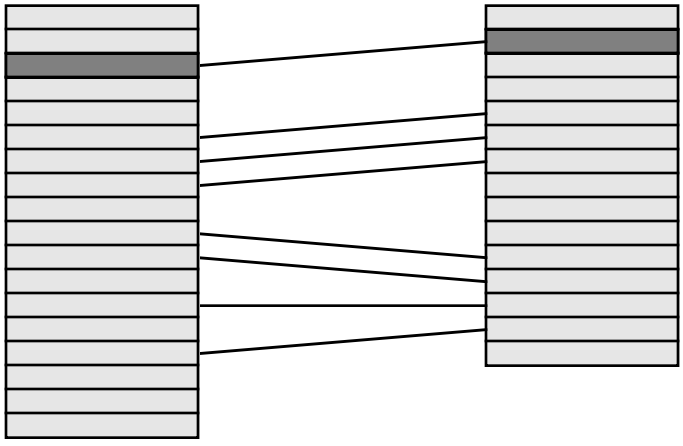
- Search lists in parallel; O(N+M) time.
- Find people with same personal information
- Then search relationship graph



Merging Algorithm (cont'd)

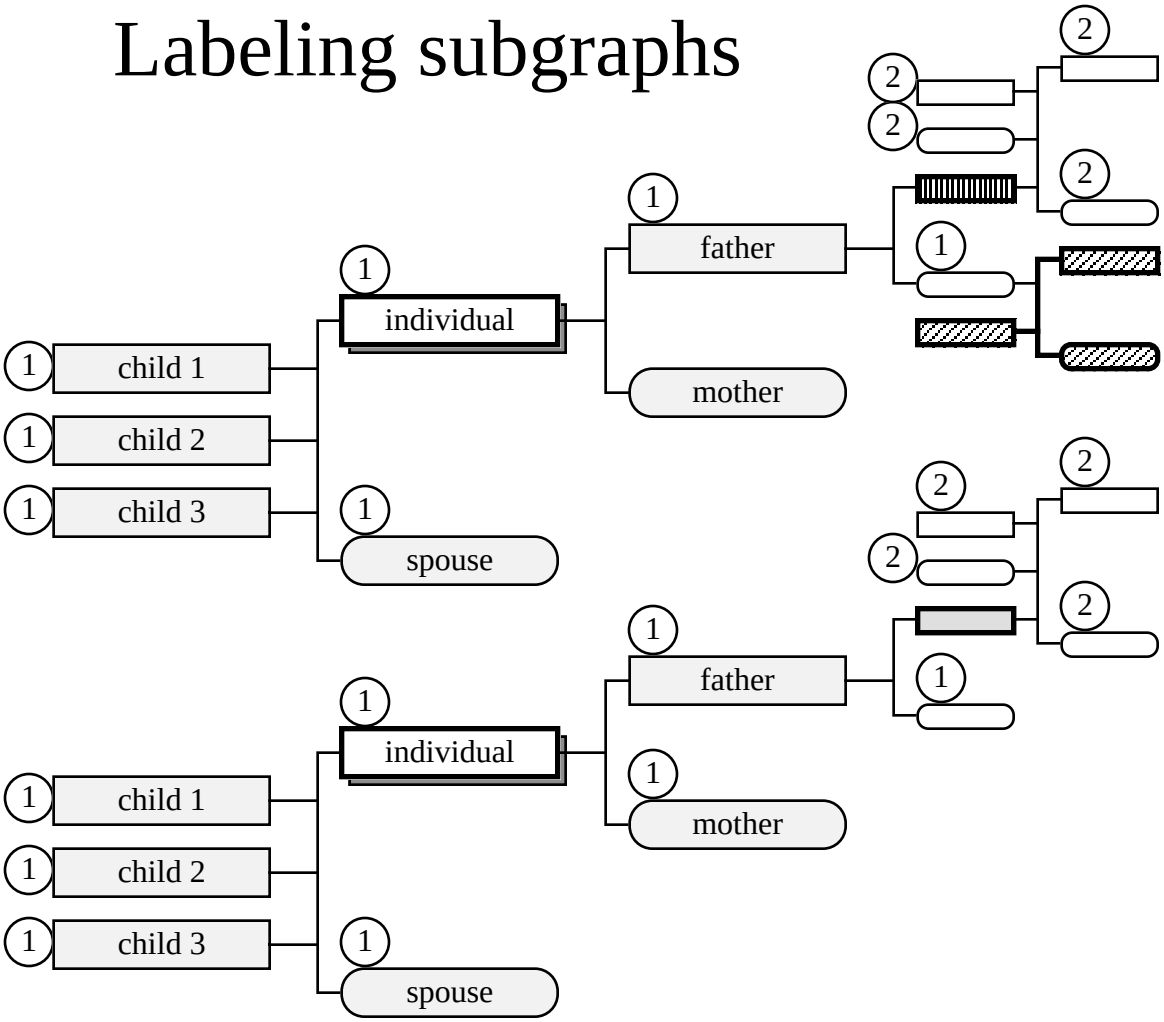
Search relationship graph

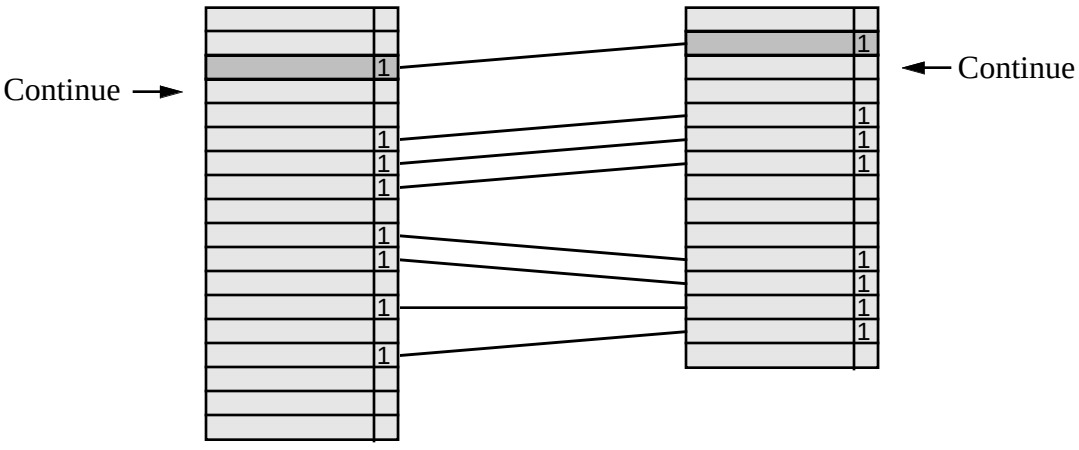




Merging Algorithm (cont'd)

Labeling subgraphs



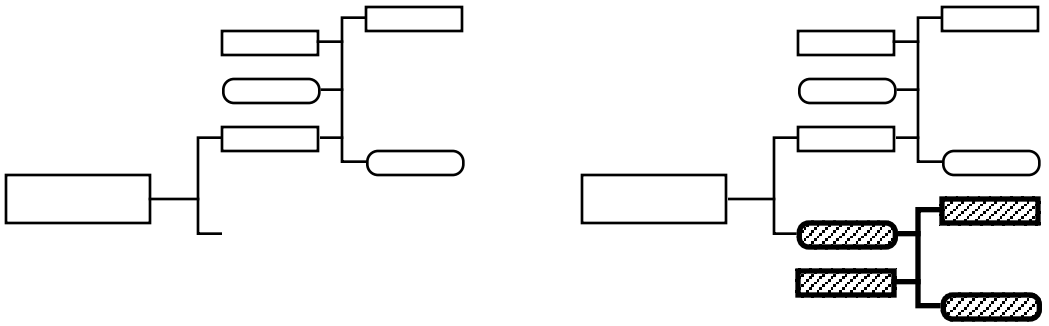


Merging Algorithm (cont'd)

III. Choose largest subgraph

IV. Incorporate new information

- *Additional individuals*



- *Additional information*
- *Conflicting information*
- *[Missing information]*

V. Connect subgraphs.

Continue until all incoming information has been included or rejected.

Uses for Graph-Based Merging

- Collaboration with family members
  - Independent updates/work/research
  - Collect information on immediate family
- Family history organization
  - Archivist assigns work to helpers
  - Research director, archivist, helpers all add to database concurrently.
- Database on multiple computers
  - Desktop/laptop; home machine; etc.
- Include previously excluded info
- Find differences between databases

Advantages
of using graph-based merging for remerging genealogy databases

- Much easier than manual approaches
- Much faster than global match/merge
- No need for checking out (locking)
- No need for ID#s
- Not restricted to single platform or software package
- Retroactive solution
- User controls changes to their data

Further Work

- Actual implementation
- Identifying “similar” people
  (to distinguish between additional individuals vs. additional or conflicting information)
- Note-merging
  - Reordered notes
  - Minor changes vs. new notes
- Multimedia
- Global differences/Style
  - “Lee Co., VA” vs. “,Lee,VA”
  - Surname capitalization
- Remembering decisions
  - Avoid repeating same decisions next time.