

OnSet: A Visualization Technique for Large-scale Binary Set Data

Ramik Sadana, Timothy Major, John Stasko
Georgia Tech



Alistair Dove
Georgia Aquarium







Taroko 50 (98)

- (3a, 5b, 7a)-23-carboxy-7-hy
- 11-trans-Leukotriene C4
- 16, 17-Epiestriol
- 16b-Hydroxyestradiol
- 17-Epiestriol
- 2, 3-Dinor-TXB2
- 2-Ethyl-2-Hydroxybutyric aci
- 2-Heptanone
- 2-Hydroxy-3-methylpentanoic
- 2-Hydroxycaproic acid
- 2-Hydroxycaprylic acid

Yushan 52 (99)

- 1-deoxy-D-xylulose
- 2, 3-Dihydroxyvaleric acid
- 2-Aminoisobutyric acid
- 2-Ethyl-2-Hydroxybutyric aci
- 2-Hydroxy-3-methylpentanoic
- 2-Hydroxycaproic acid
- 2'-Hydroxynicotine
- 2-Methylbutyrylglycine
- 3, 4-Dihydroxyphenylglycol
- 3-Aminoisobutanoic acid
- 5-Aminopentanoic acid

10 Fish, 50 Samples & 1200 Distinct Compounds
Each Sample contains between 70 and 400 Compounds

How to make sense?

- Could we predict the health of the fish?
- Is it healthier than yesterday? Last week?
- How does Taroko compare to Yushan?
- Interpretations -

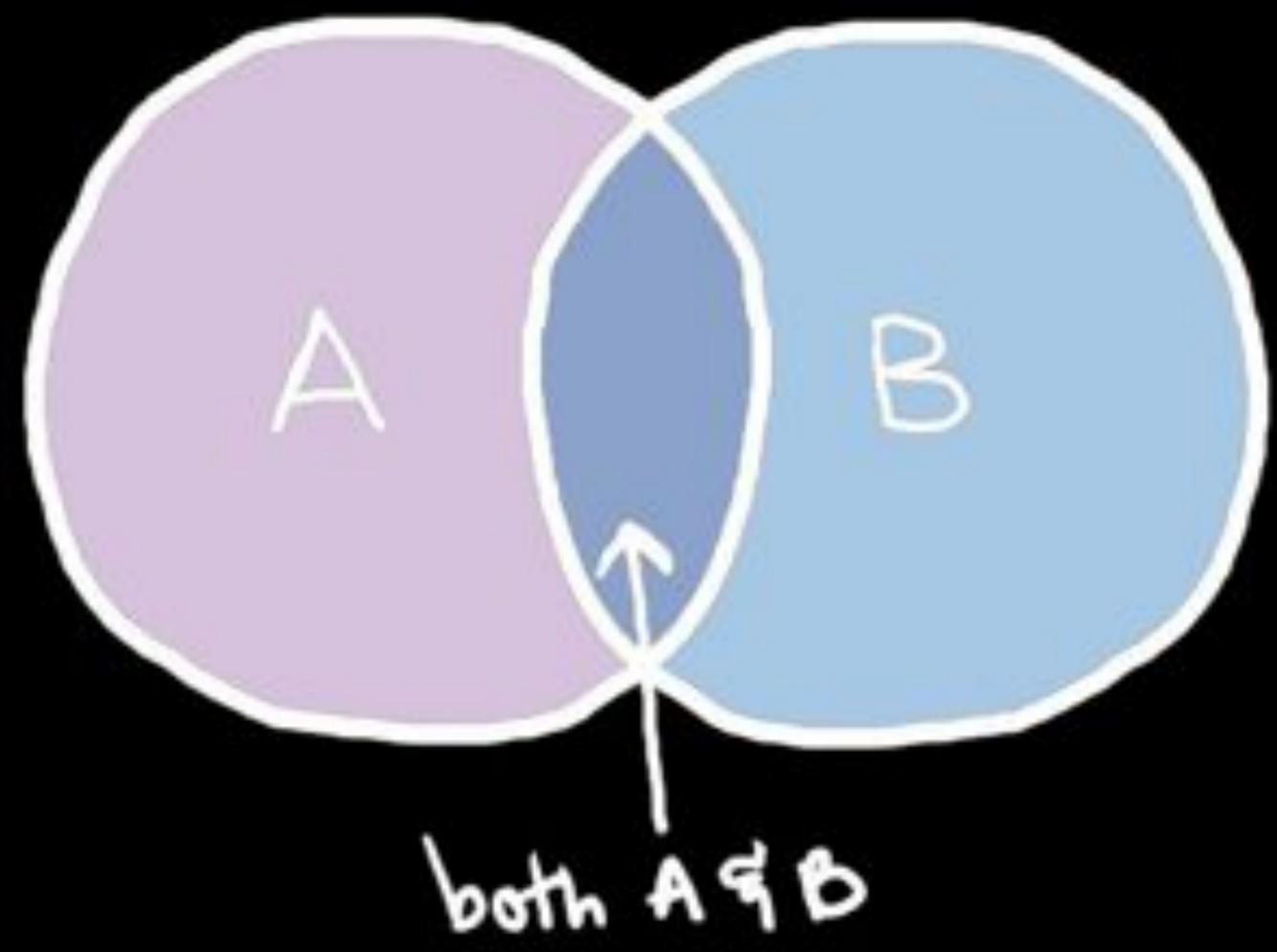
Set → Taroko 50 (98)

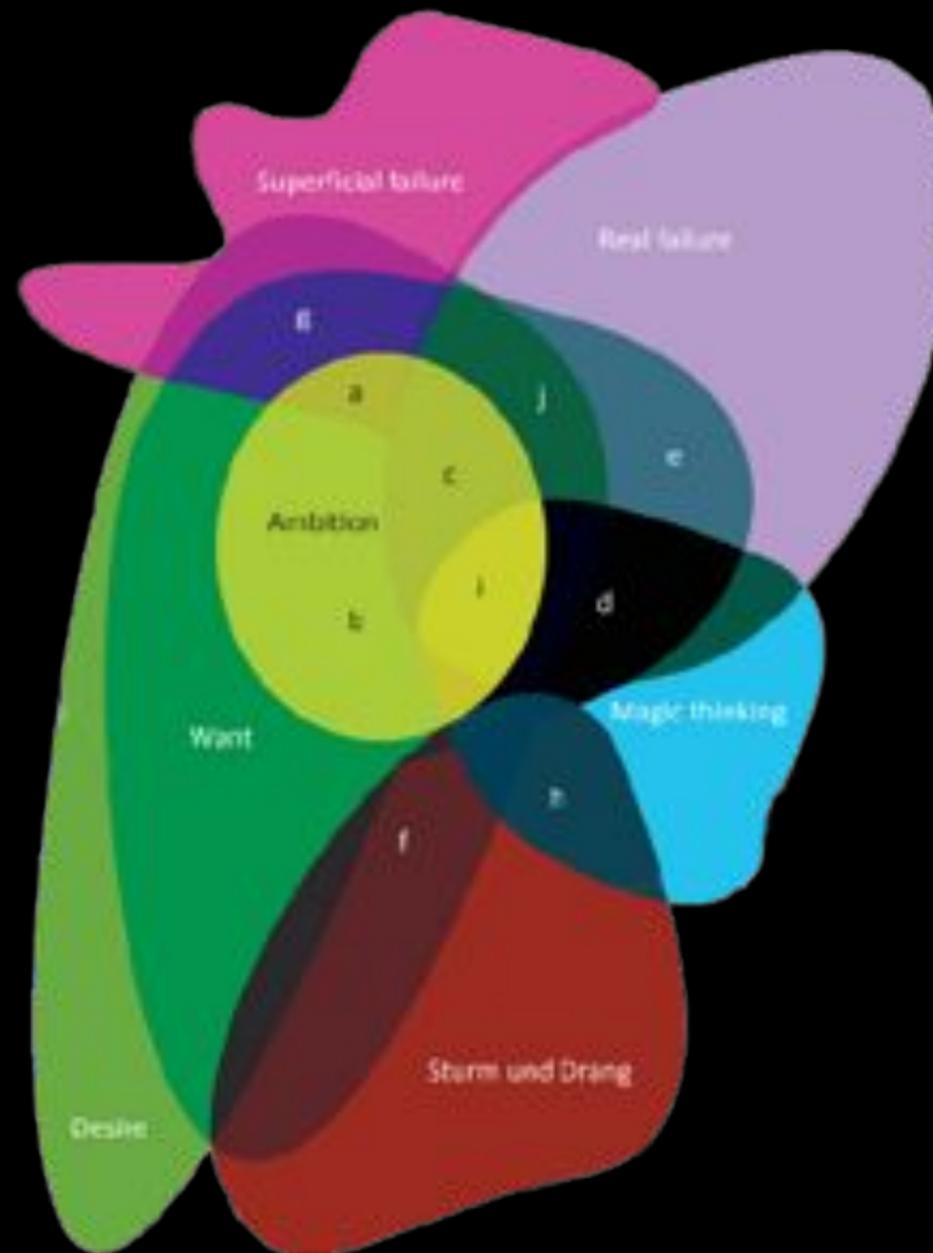
(3a, 5b, 7a)-23-carboxy-7-hy	← Element
11-trans-Leukotriene C4	← Element
16, 17-Epiestriol	← Element
16b-Hydroxyestradiol	← Element
17-Epiestriol	← Element
2, 3-Dinor-TXB2	← Element
2-Ethyl-2-Hydroxybutyric aci	← Element
2-Heptanone	← Element
2-Hydroxy-3-methylpentanoic	← Element
2-Hydroxycaproic acid	← Element
2-Hydroxycaprylic acid	← Element
...	

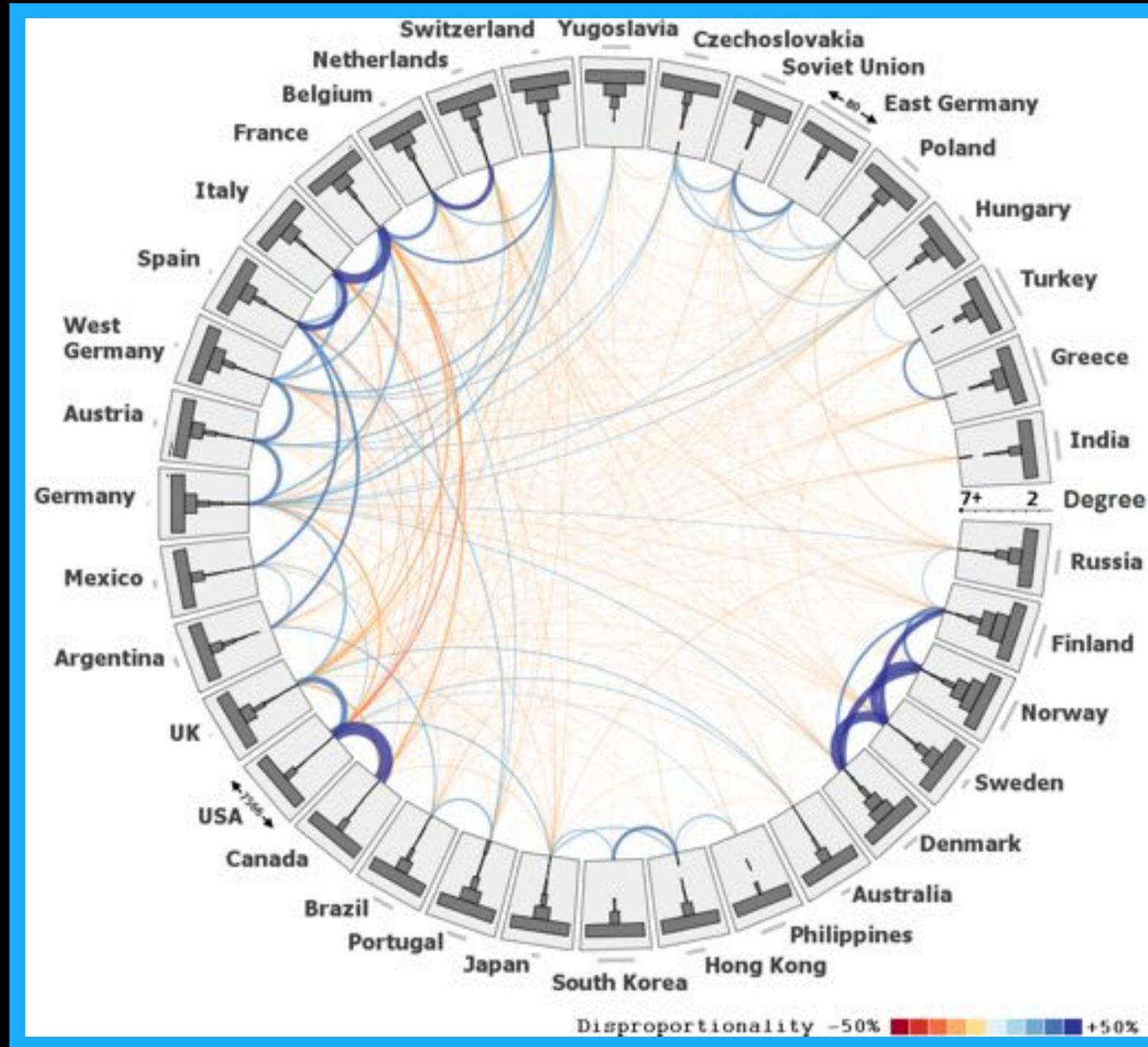
Set → Yushan 52 (99)

1-deoxy-D-xylulose	← Element
2, 3-Dihydroxyvaleric acid	← Element
2-Aminoisobutyric acid	← Element
2-Ethyl-2-Hydroxybutyric aci	← Element
2-Hydroxy-3-methylpentanoic	← Element
2-Hydroxycaproic acid	← Element
2'-Hydroxynicotine	← Element
2-Methylbutyrylglycine	← Element
3, 4-Dihydroxyphenylglycol	← Element
3-Aminoisobutanoic acid	← Element
5-Aminopentanoic acid	← Element
...	

VENN DIAGRAM!







Visualizing Sets and Set-typed Data: State-of-the-Art and Future Challenges

Bilal Alsallakh¹, Luana Micallef^{2,3}, Wolfgang Aigner^{1,4}, Helwig Hauser⁵, Silvia Miksch¹, and Peter Rodgers³

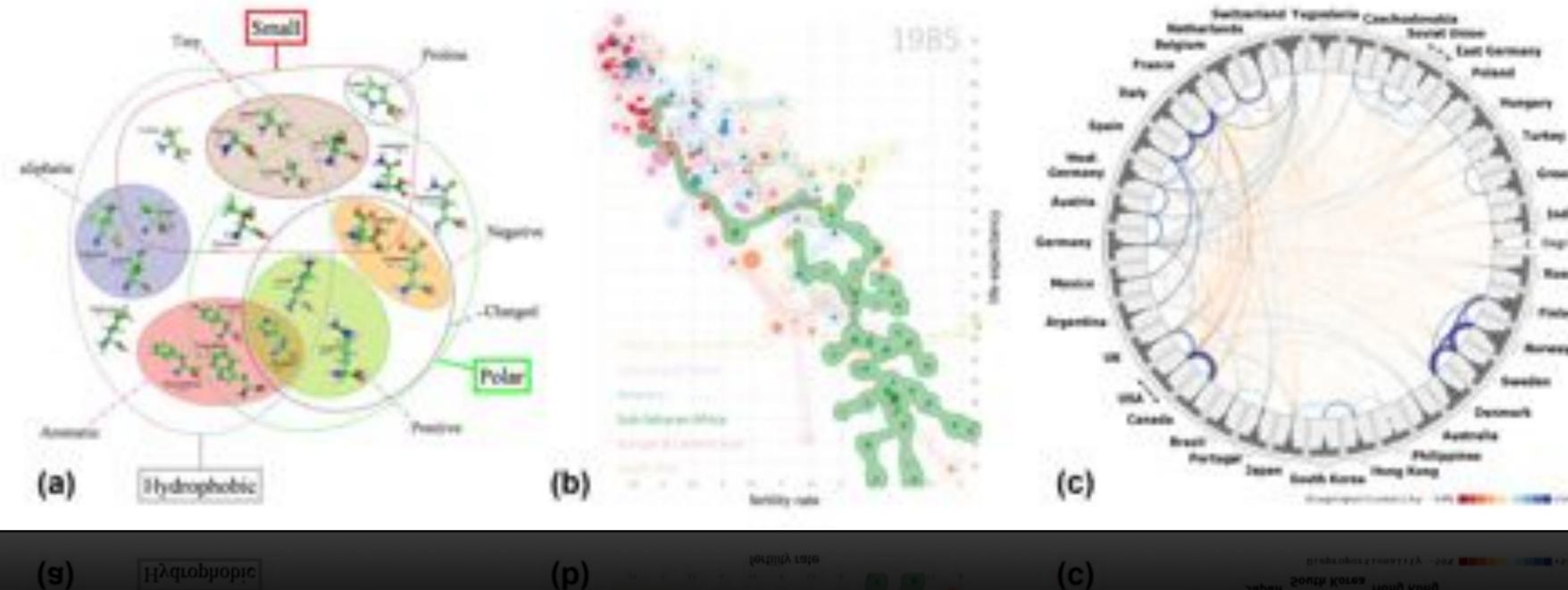
¹Vienna University of Technology, Austria

²Helsinki Institute for Information Technology HIIT, Finland

³University of Kent, United Kingdom

⁴St. Pölten University of Applied Sciences, Austria

⁵University of Bergen, Norway



B. Alsallakh, L. Micallef, W. Aigner, H. Hauser, S. Miksch, and P. Rodgers. **Visualizing Sets and Set-Typed Data: State-of-the-Art and Future Challenges**. In STAR Proceedings of the EuroVis'14.

Taroko 50 (98)

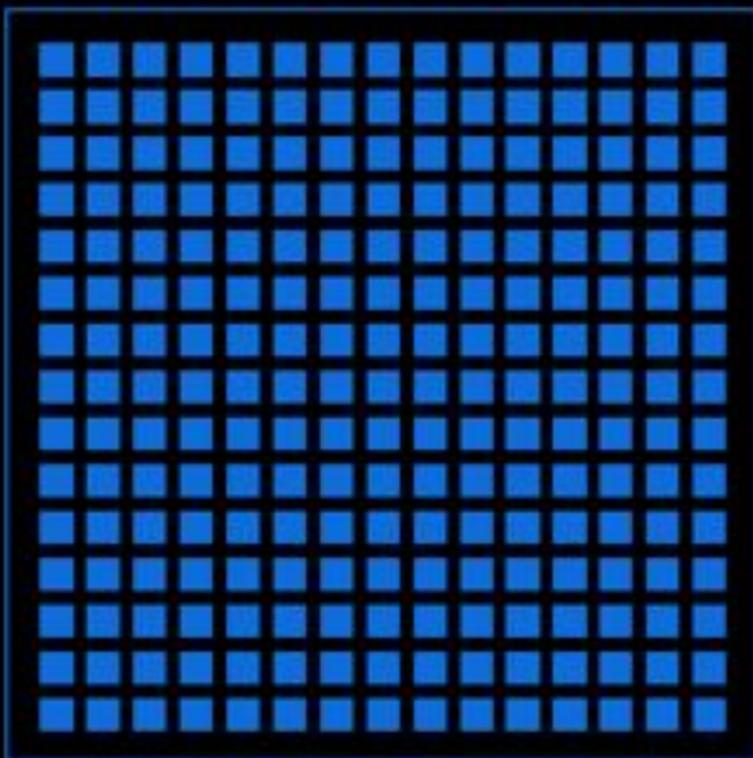
(3a, 5b, 7a)-23-carboxy-7-hy
11-trans-Leukotriene C4
16, 17-Epiestriol
16b-Hydroxyestradiol
17-Epiestriol
2, 3-Dinor-TXB2
2-Ethyl-2-Hydroxybutyric aci
2-Heptanone
2-Hydroxy-3-methylpentanoic
2-Hydroxycaproic acid
2-Hydroxycaprylic acid

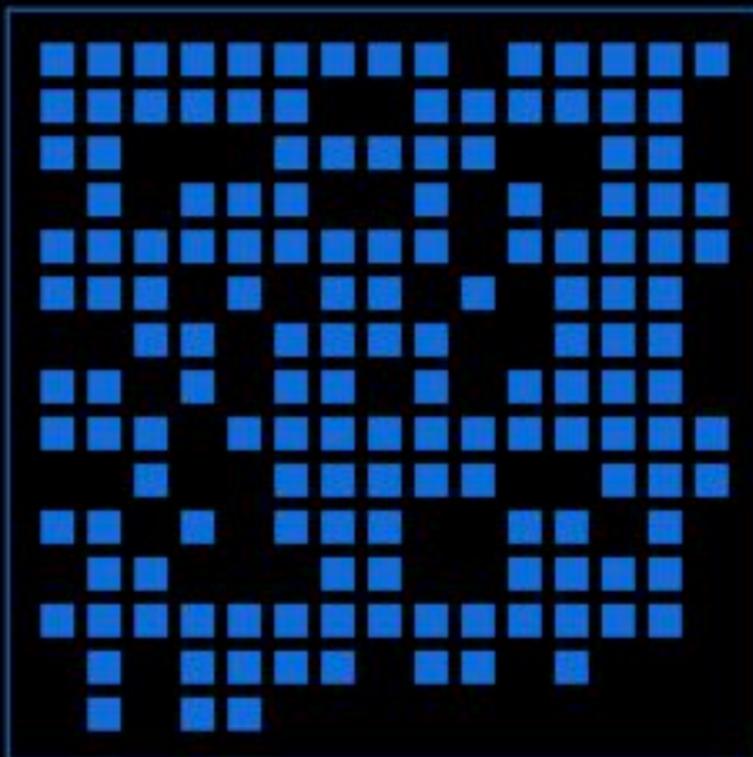
Yushan 52 (99)

1-deoxy-D-xylulose
2, 3-Dihydroxyvaleric acid
2-Aminoisobutyric acid
2-Ethyl-2-Hydroxybutyric aci
2-Hydroxy-3-methylpentanoic
2-Hydroxycaproic acid
2'-Hydroxynicotine
2-Methylbutyrylglycine
3, 4-Dihydroxyphenylglycol
3-Aminoisobutanoic acid
5-Aminopentanoic acid

Acetylglycine
Sulfolithocholylglycine
Glutarylglycine
2-Methylbutyrylglycine
3-Phenylpropionylglycine
Isovalerylglycine
Phenylpropionylglycine
Valerylglycine
D-Glyceraldehyde 3-phosphate
Dihydroxyacetone phosphate²
Glycolaldehyde
"3, 4-Dihydroxyphenylglycol"
Phenol
Vanillyl glycol
"Propane-1, 2-diol"
Propylene glycol
Tyrosol
Isopropyl alcohol
Propyl alcohol
Soleole
Cinnamaldehyde
Propanal
N-Methylformamide
Acetaldehyde









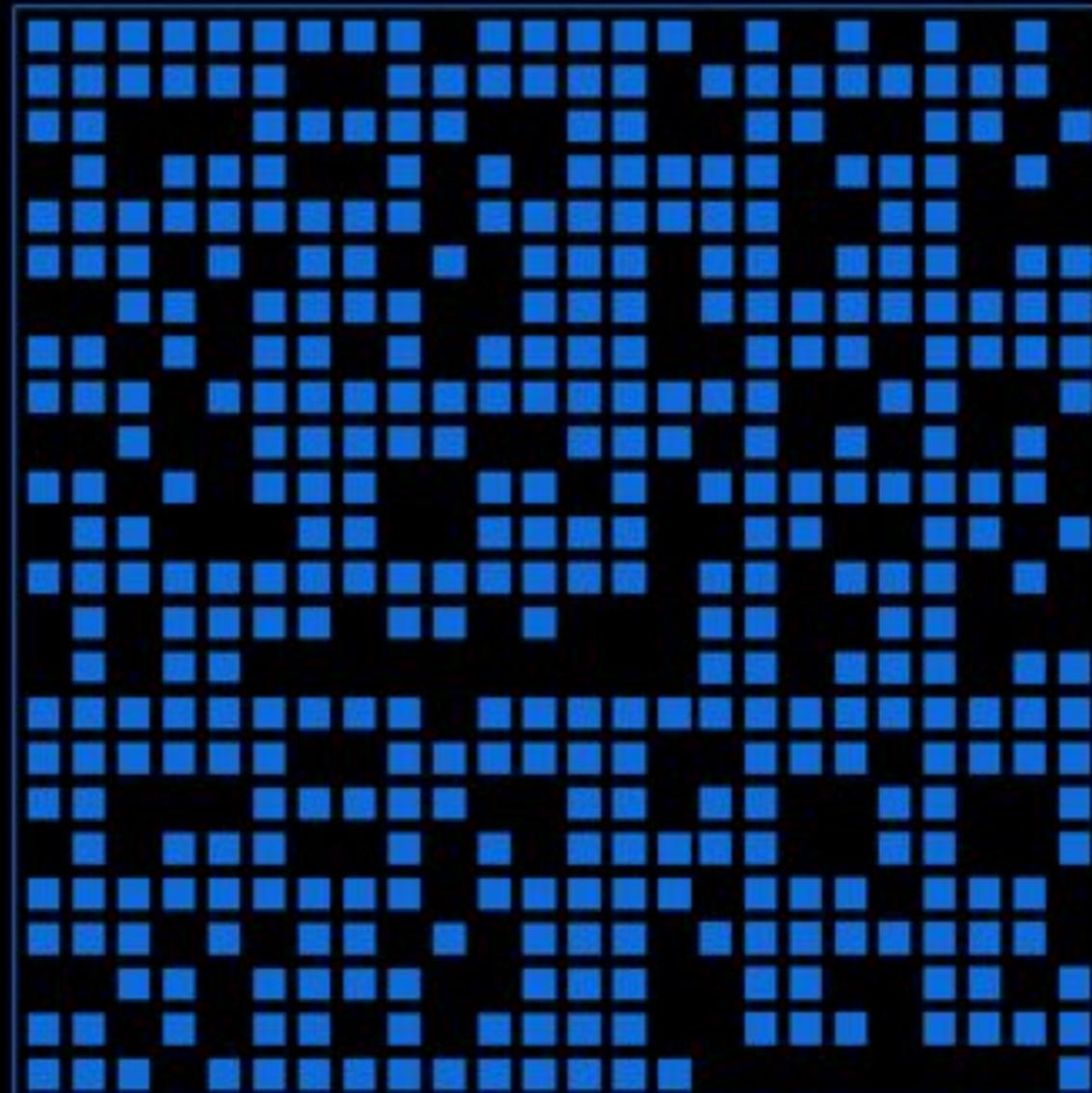
Norton 7

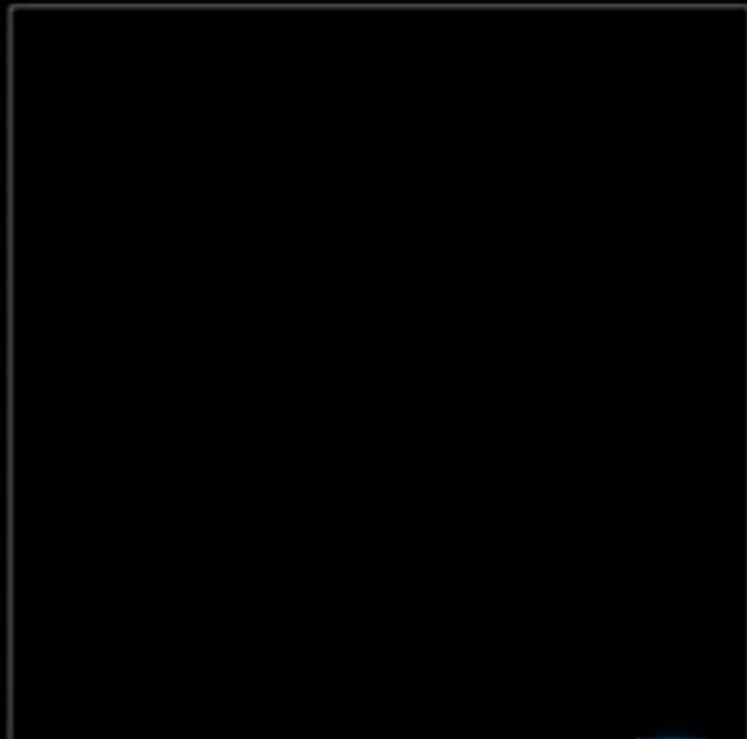
170



Norton 7

370





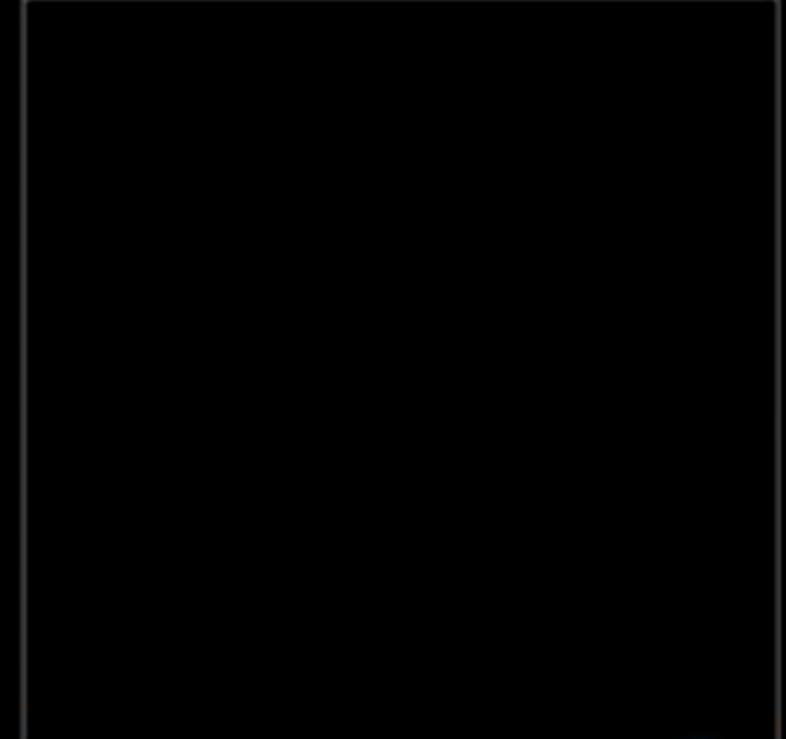
Norton 27

78



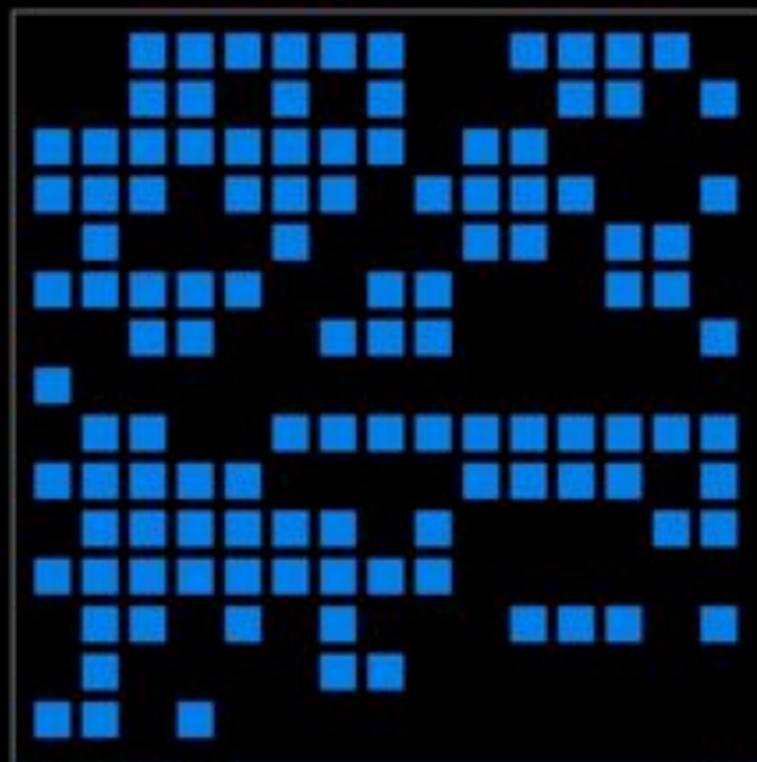
Norton 7

170



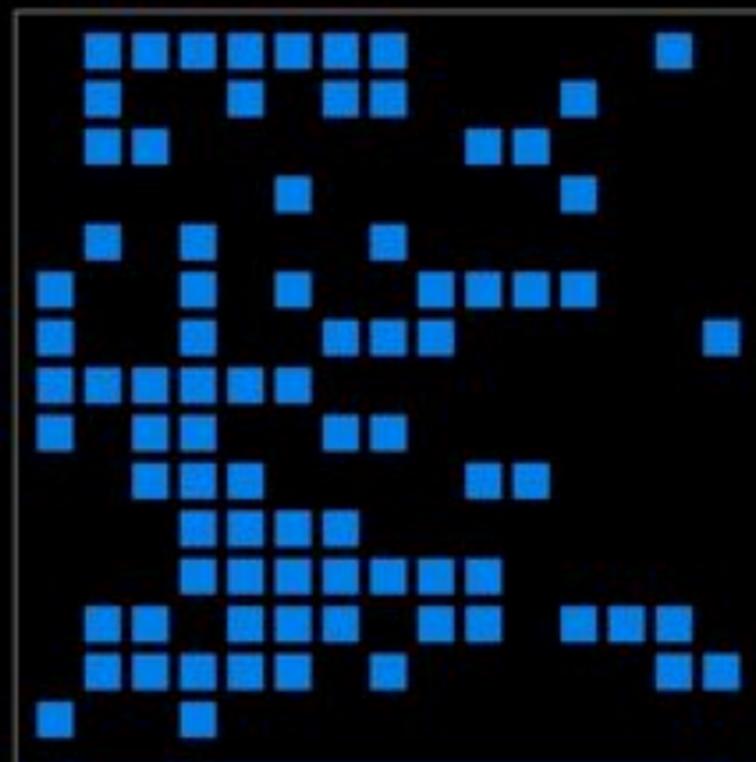
Norton 17

78



Norton 9

236



Norton 20

348



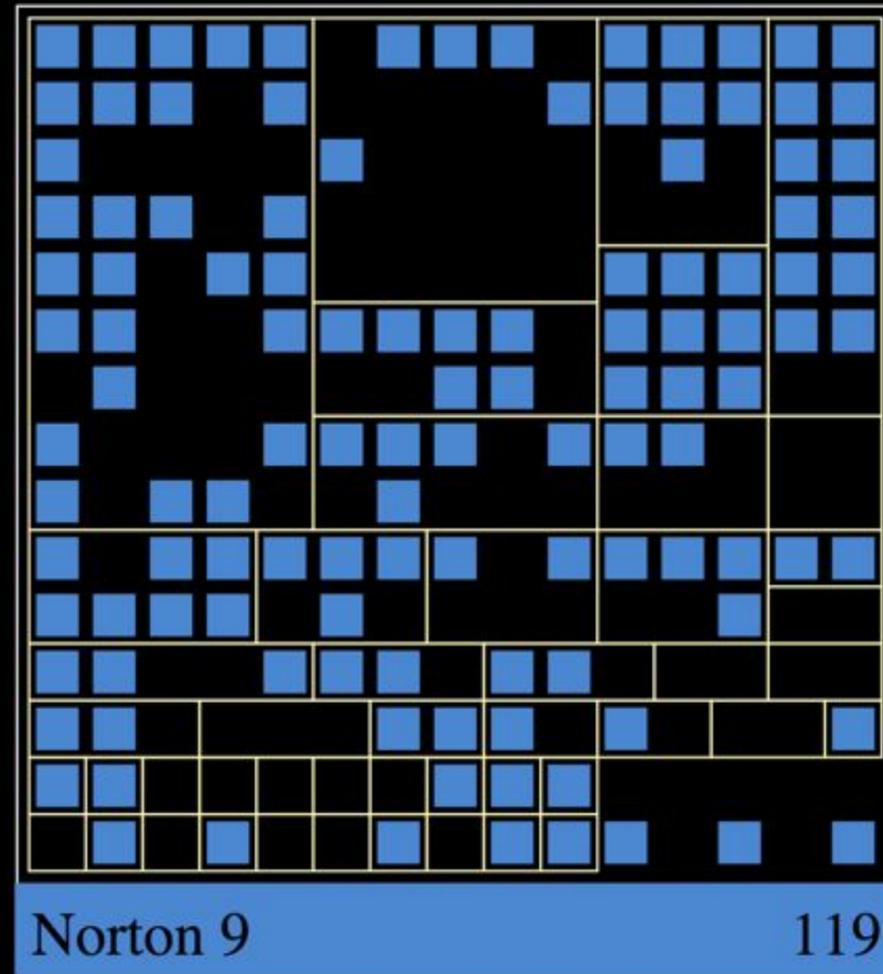
Pixel Ordering

1. Frequency
2. Alphabetical
3. Hierarchy

Hierarchical data

Compound	HMDB Class
Acetylglycine	Acyl Glycines
Sulfolithocholyglycine	Acyl Glycines
D-Glyceraldehyde 3-phosphate	Acyl Phosphates
Dihydroxyacetone phosphate2	Acyl Phosphates
Glycolaldehyde	Alcohols and Polyols
3, 4-Dihydroxyphenylglycol	Alcohols and Polyols
Phenol	Alcohols and Polyols
Formaldehyde	Aldehydes
Dimethylamine	Aliphatic and Aryl Amines
Trimethylamine	Aliphatic and Aryl Amines
Vaporole	Alky Nitrates
N-Acetylglutamine	Amino Acids
Trigonelline	Amino Acids

Hierarchical data

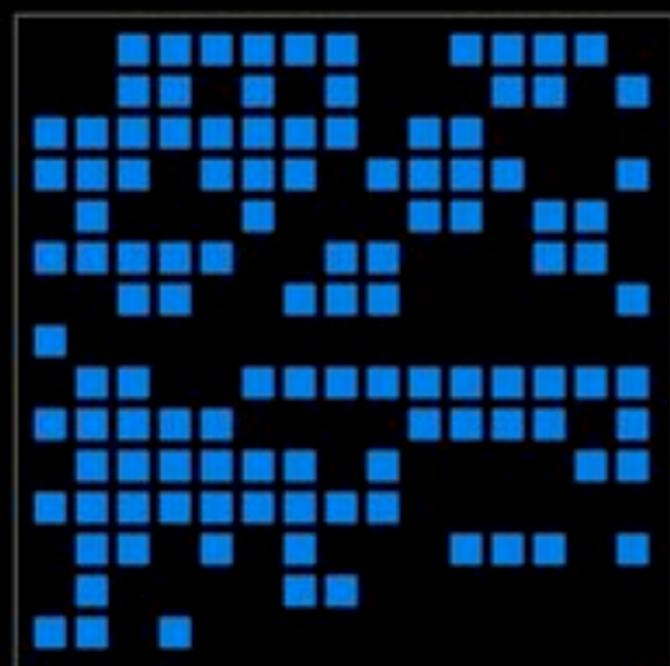


Interaction



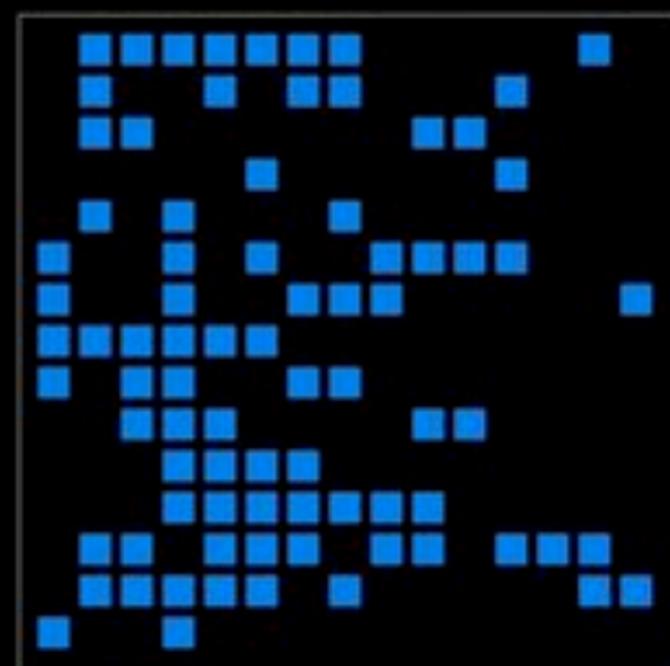
Norton 9

236



Norton 9

236

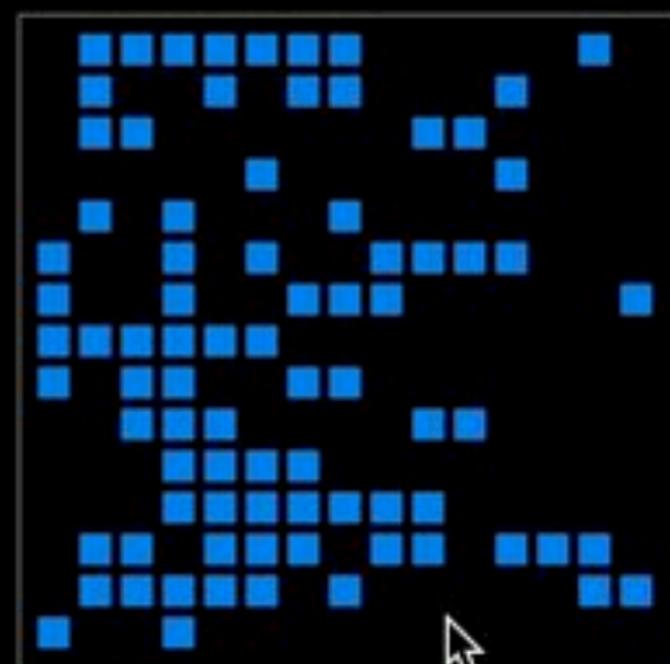


Norton 20

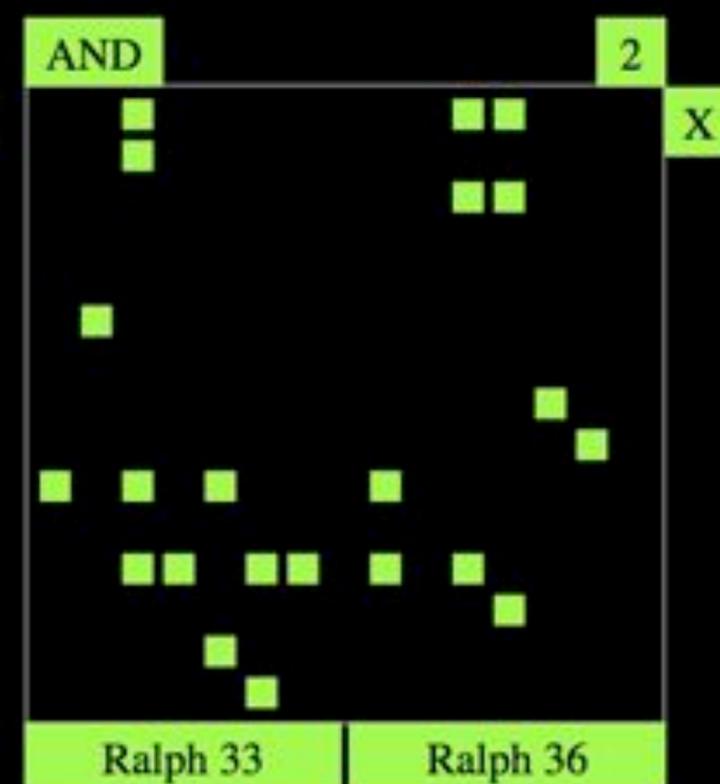
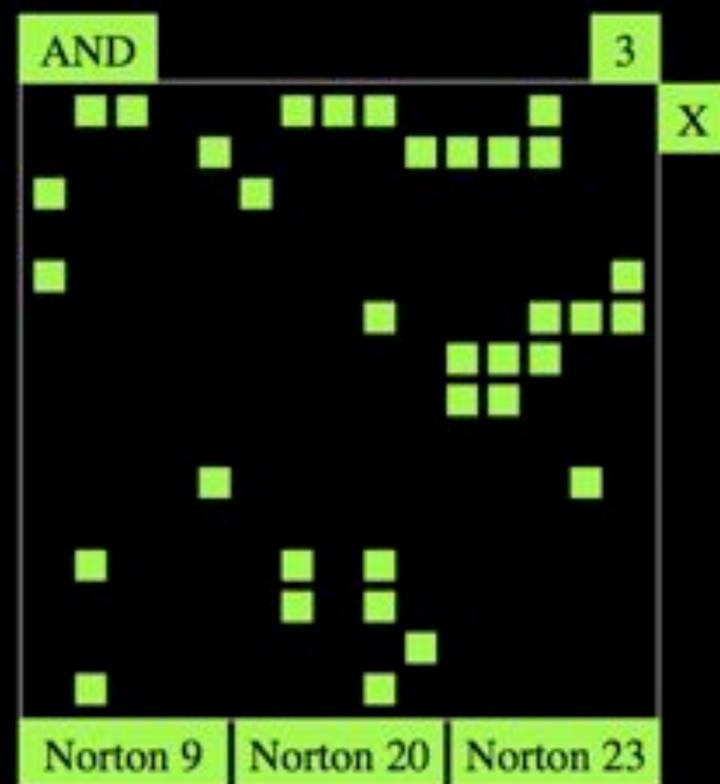
348

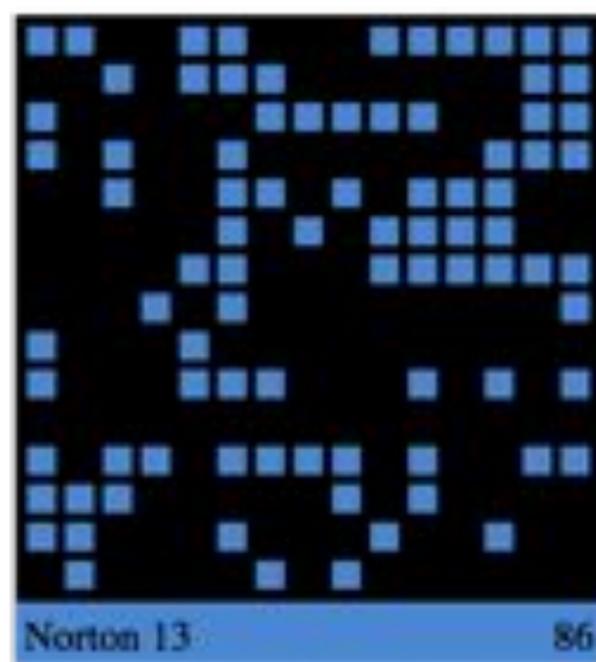
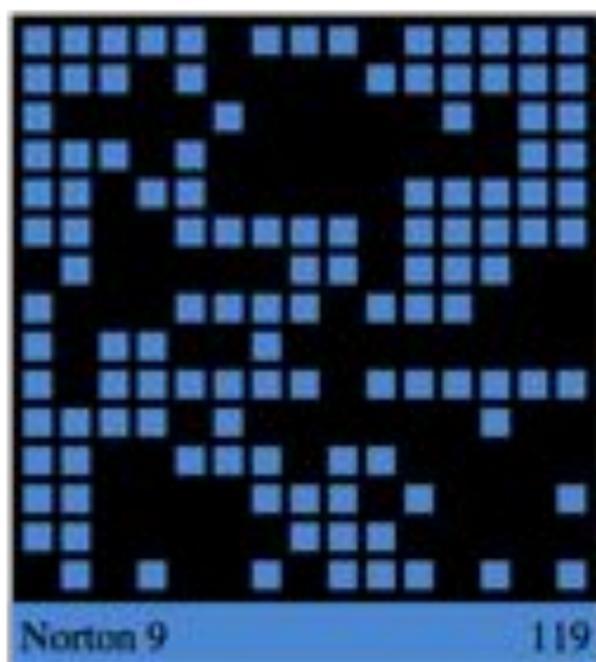


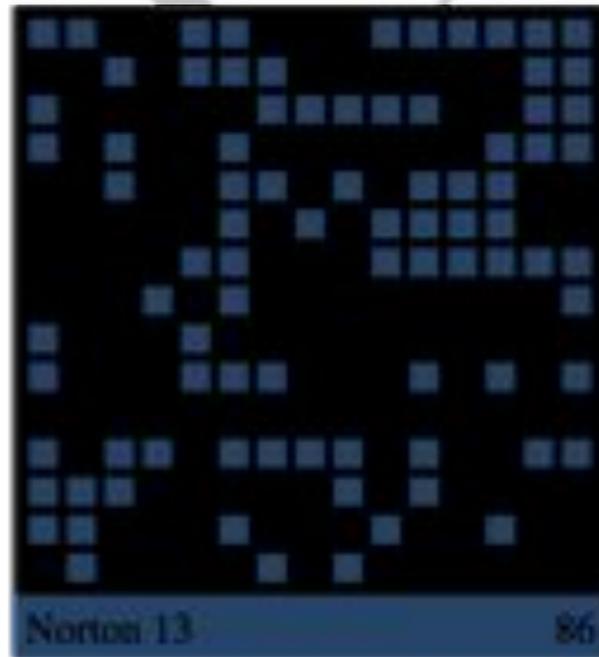
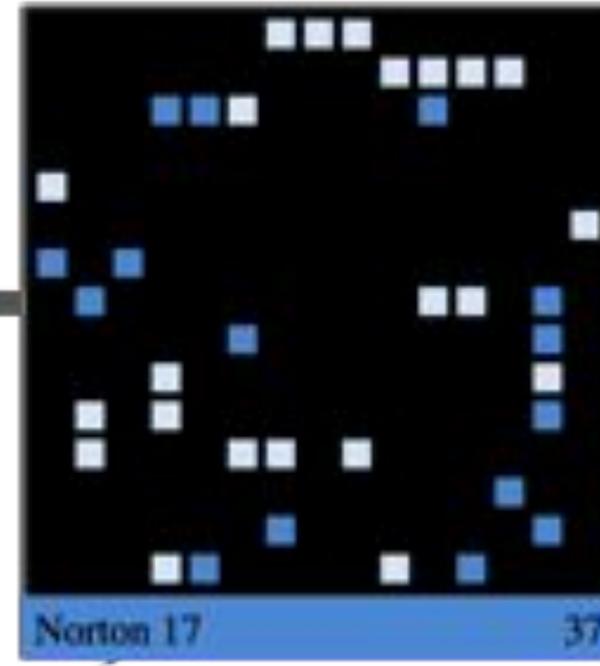
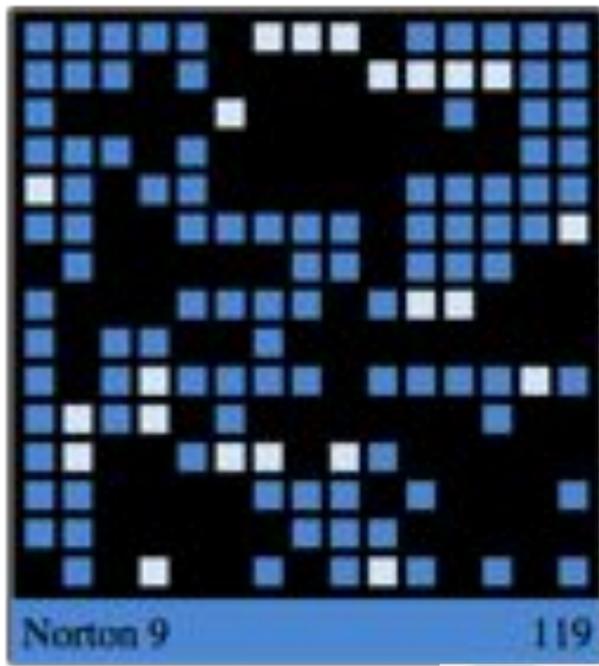
Norton 9 236



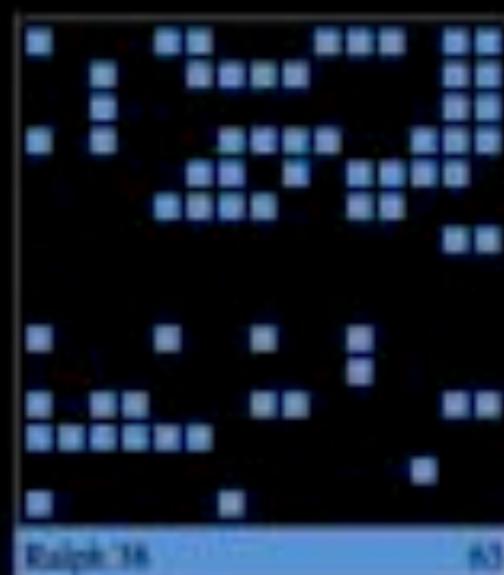
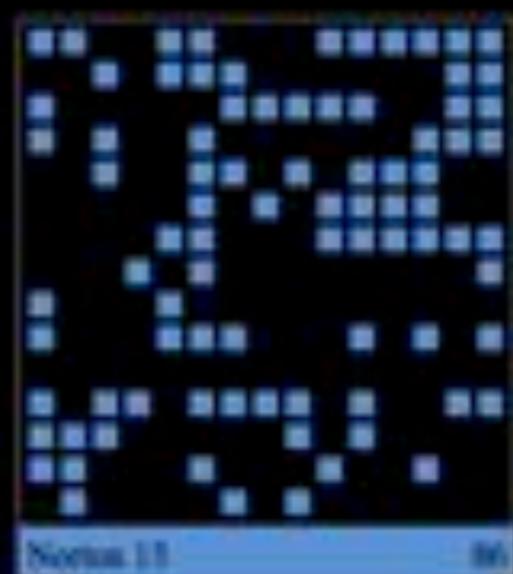
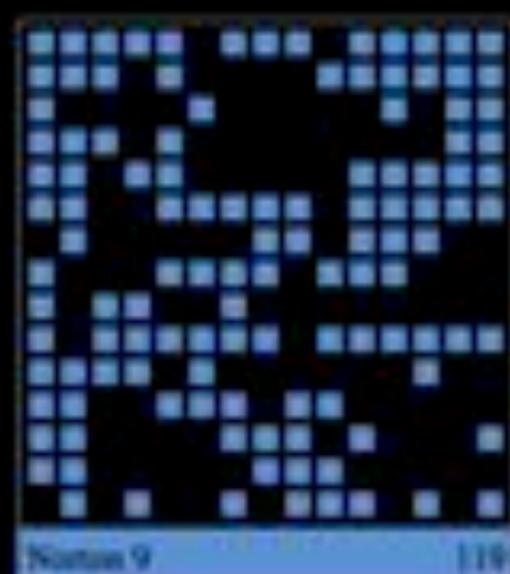
Norton 20 348





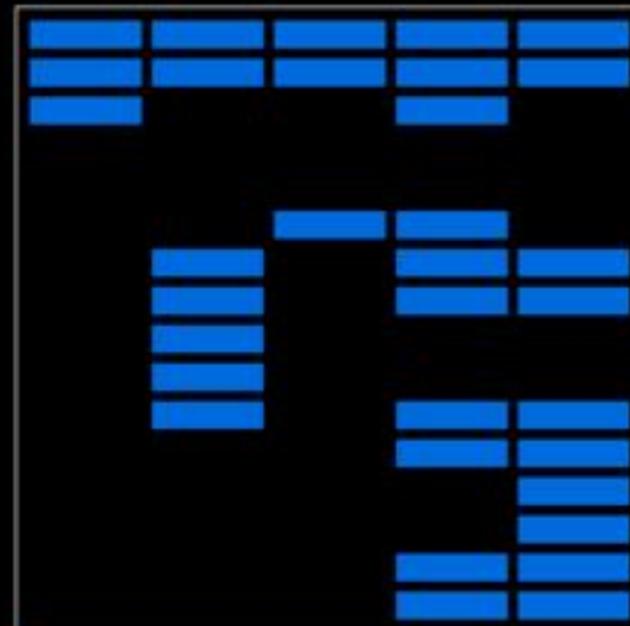


System

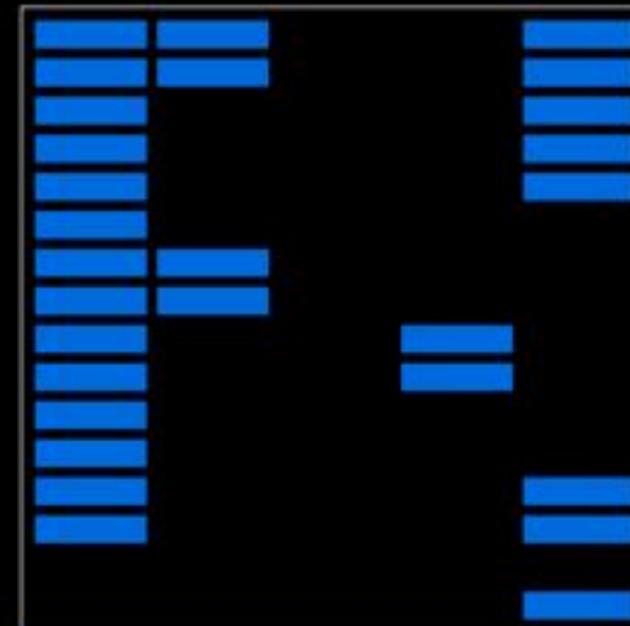


Domains

Calendar

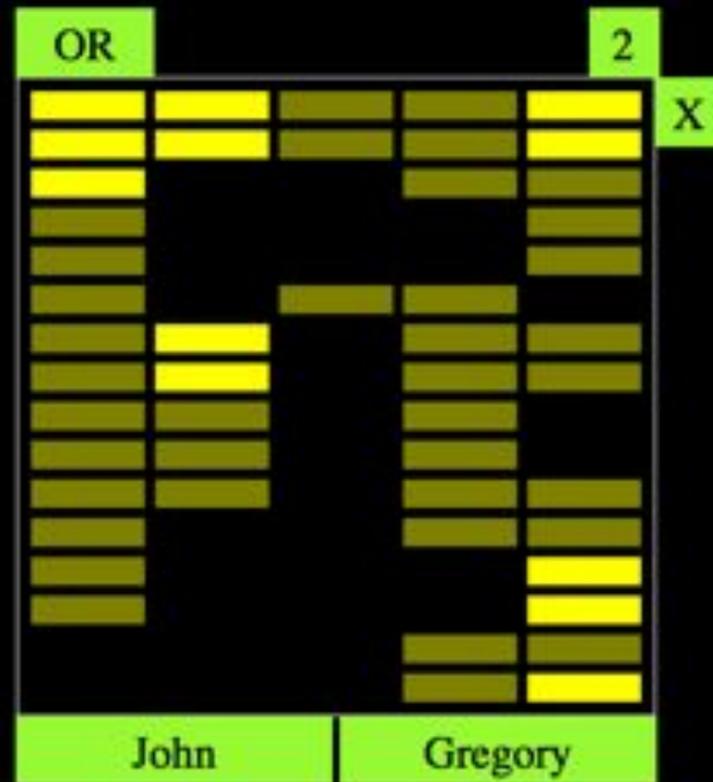


John



Gregory

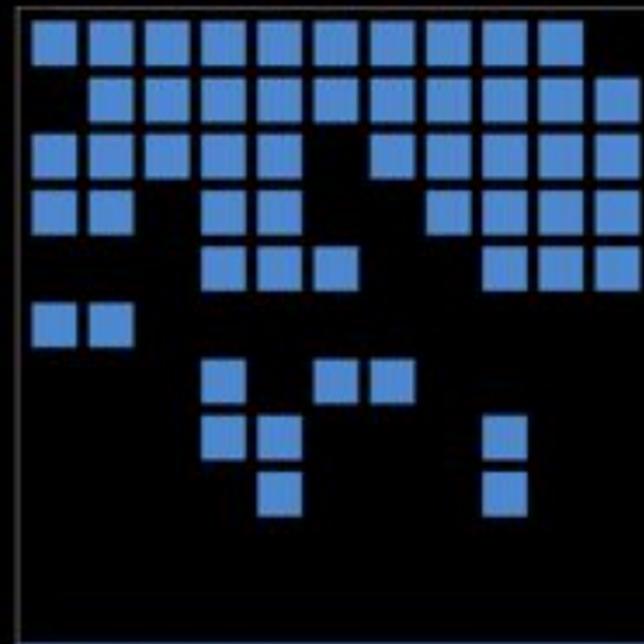
Calendar



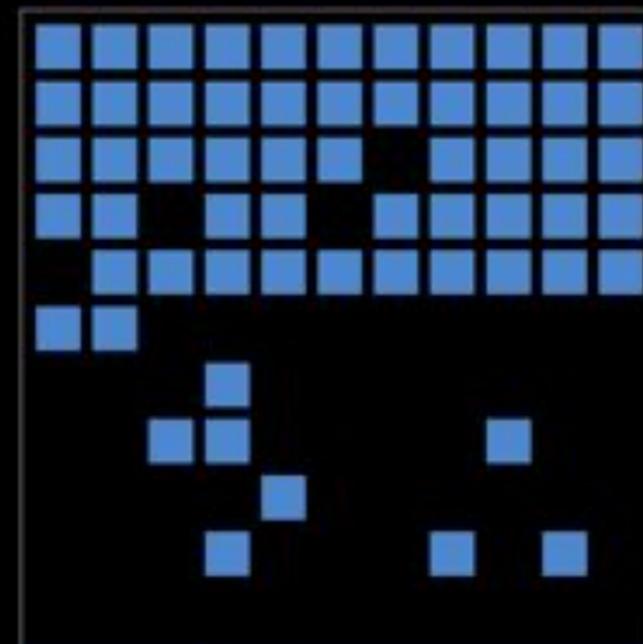
Calendar



US Senate Voting

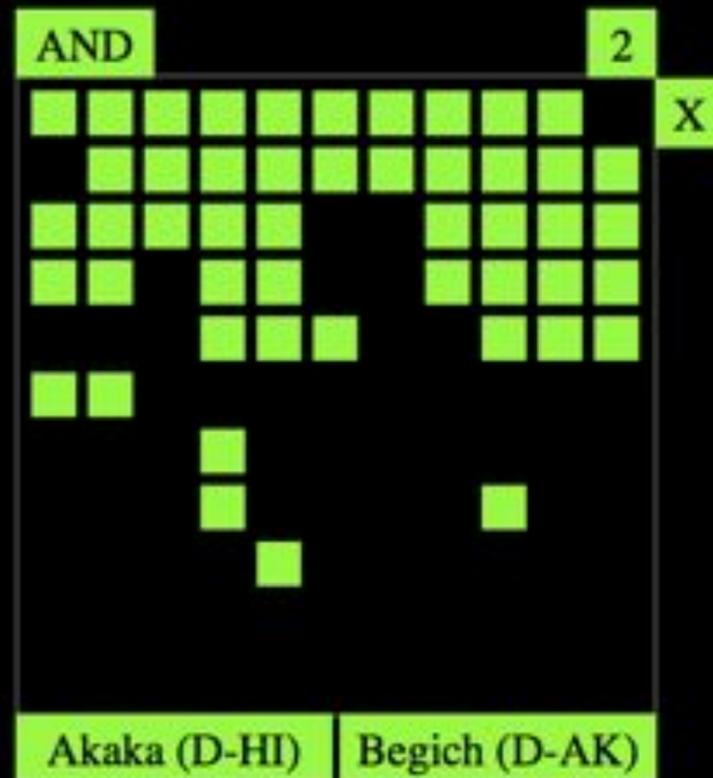


Akaka (D-HI)

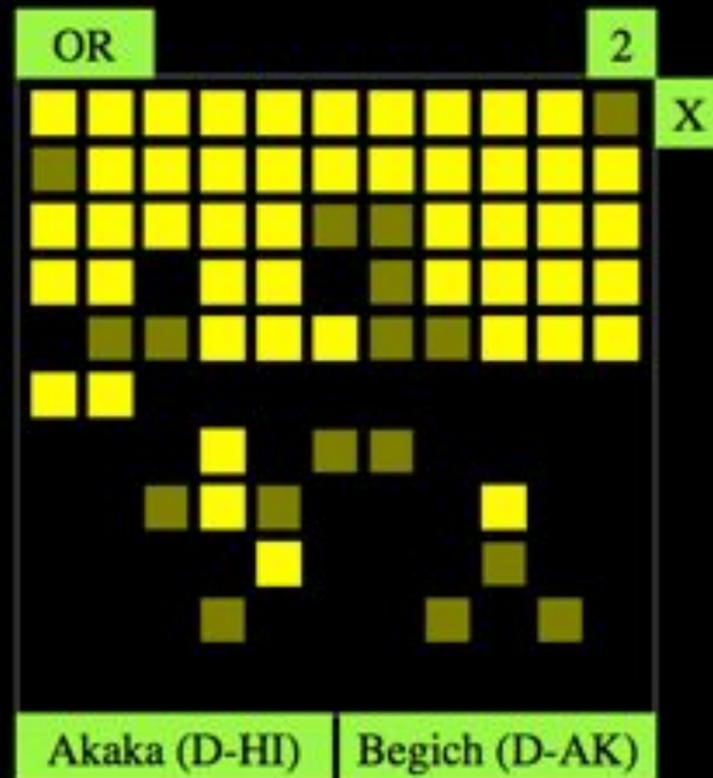


Begich (D-AK)

US Senate Voting



US Senate Voting



- check it out -

<http://www.cc.gatech.edu/gvu/ii/setvis/>

OR

google “*Stasko OnSet*”

Template data



Whaleshark



Senate

Custom data



Upload csv file



Or, drag and drop csv file



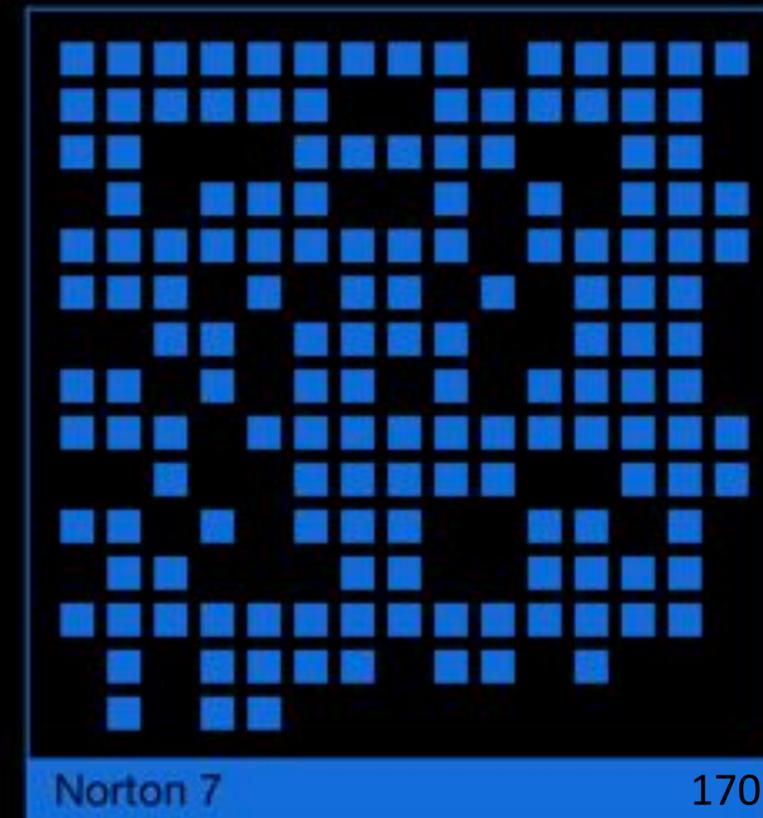
Conclusion

1.



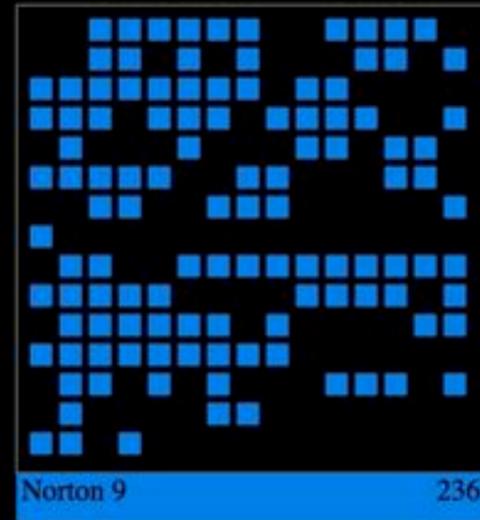
Conclusion

2.



Conclusion

3.



Conclusion

4. google “*Stasko OnSet*”

Acknowledgment

- Tim Dwyer
- NSF IIS-0915788, NSF IIS-1320537, CCF-0808863 (FODAVA lead)
- DARPA's XDATA program
- The excellent <http://mitchmartinez.com> for the water animation.
- Zú and Robert Hodgkin (@flight404) for consistent inspiration.

-thankyou-

Questions?

