PerTabVIS : Project Update

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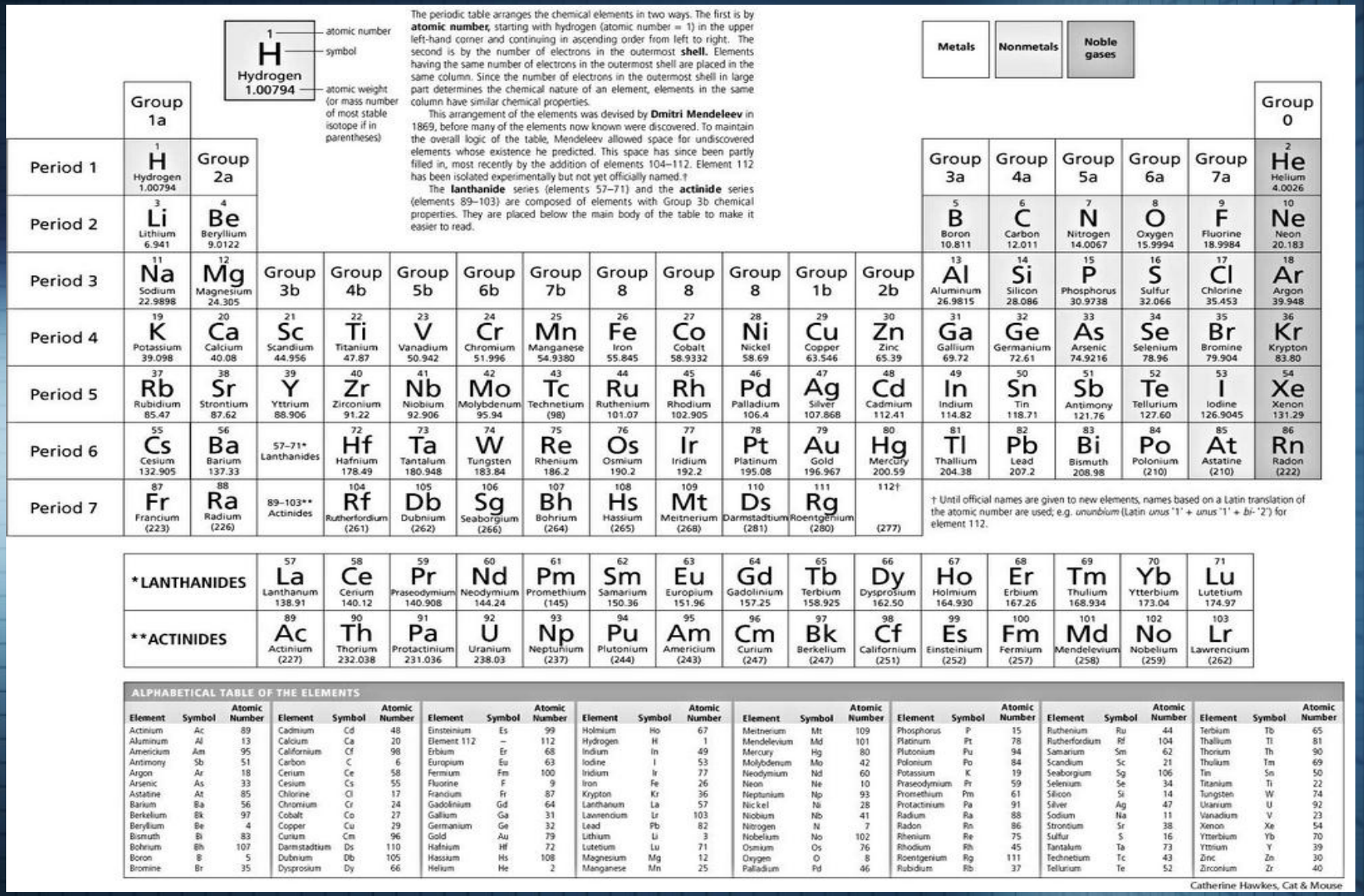
Outline

1. Background
2. Project Introduction
3. Progress
4. Future Work

Background

- Periodic Table
  - First proposed by [*Dmitri Mendeleev, 1869*]
  - Reveals the relationship between elements
  - Predicts the possible properties of the yet discovered ones
  - Looks like…

Background



The periodic table arranges the chemical elements in two ways. The first is by **atomic number,** starting with hydrogen (atomic number = 1) in the upper left-hand corner and continuing in ascending order from left to right. The second is by the number of electrons in the outermost **shell.** Elements having the same number of electrons in the outermost shell are placed in the same column. Since the number of electrons in the outermost shell in large part determines the chemical nature of an element, elements in the same column have similar chemical properties.

This arrangement of the elements was devised by **Dmitri Mendeleev** in 1869, before many of the elements now known were discovered. To maintain the overall logic of the table, Mendeleev allowed space for undiscovered elements whose existence he predicted. This space has since been partly filled in, most recently by the addition of elements 104–112. Element 112 has been isolated experimentally but not yet officially named.†

The **lanthanide** series (elements 57–71) and the **actinide** series (elements 89–103) are composed of elements with Group 3b chemical properties. They are placed below the main body of the table to make it easier to read.

ALPHABETICAL TABLE OF THE ELEMENTS

Element	Symbol	Atomic Number
Actinium	Ac	89
Aluminum	Al	13
Americium	Am	95
Antimony	Sb	51
Argon	Ar	18
Arsenic	As	33
Astatine	At	85
Barium	Ba	56
Berkelium	Bk	97
Beryllium	Be	4
Bismuth	Bi	83
Bohrium	Bh	107
Boron	B	5
Bromine	Br	35
Cadmium	Cd	48
Calcium	Ca	20
Californium	Cf	98
Carbon	C	6
Cerium	Ce	58
Cesium	Cs	55
Chlorine	Cl	17
Chromium	Cr	24
Cobalt	Co	27
Copper	Cu	29
Curium	Cm	96
Darmstadtium	Ds	110
Dubnium	Db	105
Dysprosium	Dy	66
Einsteinium	Es	99
Element 112	–	112
Erbium	Er	68
Europium	Eu	63
Fermium	Fm	100
Fluorine	F	9
Francium	Fr	87
Gadolinium	Gd	64
Gallium	Ga	31
Germanium	Ge	32
Gold	Au	79
Hafnium	Hf	72
Hassium	Hs	108
Helium	He	2
Holmium	Ho	67
Hydrogen	H	1
Indium	In	49
Iodine	I	53
Iridium	Ir	77
Iron	Fe	26
Krypton	Kr	36
Lanthanum	La	57
Lawrencium	Lr	103
Lead	Pb	82
Lithium	Li	3
Lutetium	Lu	71
Magnesium	Mg	12
Manganese	Mn	25
Meitnerium	Mt	109
Mendelevium	Md	101
Mercury	Hg	80
Molybdenum	Mo	42
Neodymium	Nd	60
Neon	Ne	10
Neptunium	Np	93
Nickel	Ni	28
Niobium	Nb	41
Nitrogen	N	7
Nobelium	No	102
Osmium	Os	76
Oxygen	O	8
Palladium	Pd	46
Phosphorus	P	15
Platinum	Pt	78
Plutonium	Pu	94
Polonium	Po	84
Potassium	K	19
Praseodymium	Pr	59
Promethium	Pm	61
Protactinium	Pa	91
Radium	Ra	88
Radon	Rn	86
Rhenium	Re	75
Rhodium	Rh	45
Roentgenium	Rg	111
Rubidium	Rb	37
Ruthenium	Ru	44
Rutherfordium	Rf	104
Samarium	Sm	62
Scandium	Sc	21
Seaborgium	Sg	106
Selenium	Se	34
Silicon	Si	14
Silver	Ag	47
Sodium	Na	11
Strontium	Sr	38
Sulfur	S	16
Tantalum	Ta	73
Technetium	Tc	43
Tellurium	Te	52
Terbium	Tb	65
Thallium	Tl	81
Thorium	Th	90
Thulium	Tm	69
Tin	Sn	50
Titanium	Ti	22
Tungsten	W	74
Uranium	U	92
Vanadium	V	23
Xenon	Xe	54
Ytterbium	Yb	70
Yttrium	Y	39
Zinc	Zn	30
Zirconium	Zr	40

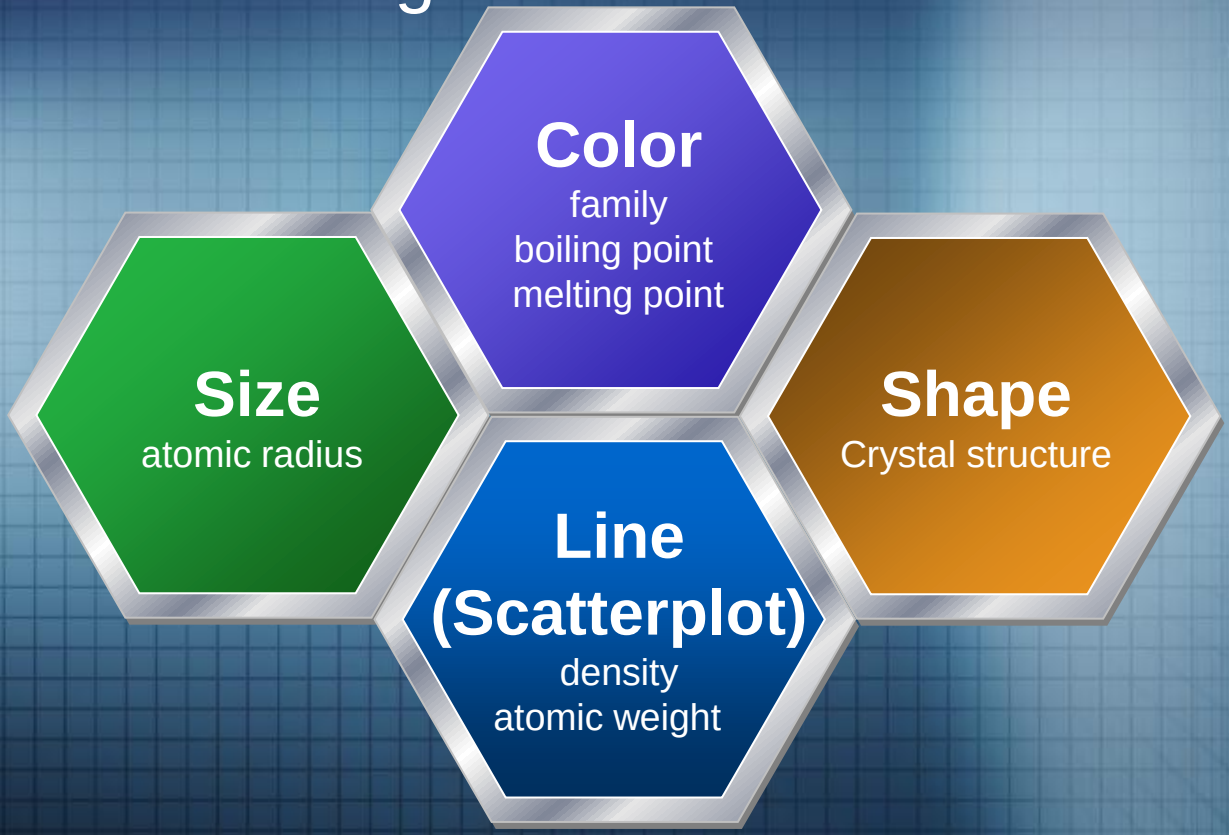
Catherine Hawkes, Cat & Mouse

Project Introduction

- Domain & Task
  - ***PerTabVIS*** is to provide a visualized and interactive way for general use.
  - Show the basic information of periodic table
  - Effective encoding method.
  - Allow users to see and compare whatever they are interested in.
  - Easy to use.

Project Introduction

- Proposed solution
  - Visual encoding



Project Introduction

- Proposed solution
  - View methods

Single

- elements periodic table
- elements property table

Multiple

- highlight corresponding properties
- select and filter the corresponding objects in different panels
- show the elements properties in either table or parallel coordinates

Project Introduction

- Proposed solution
  - Implementation approach

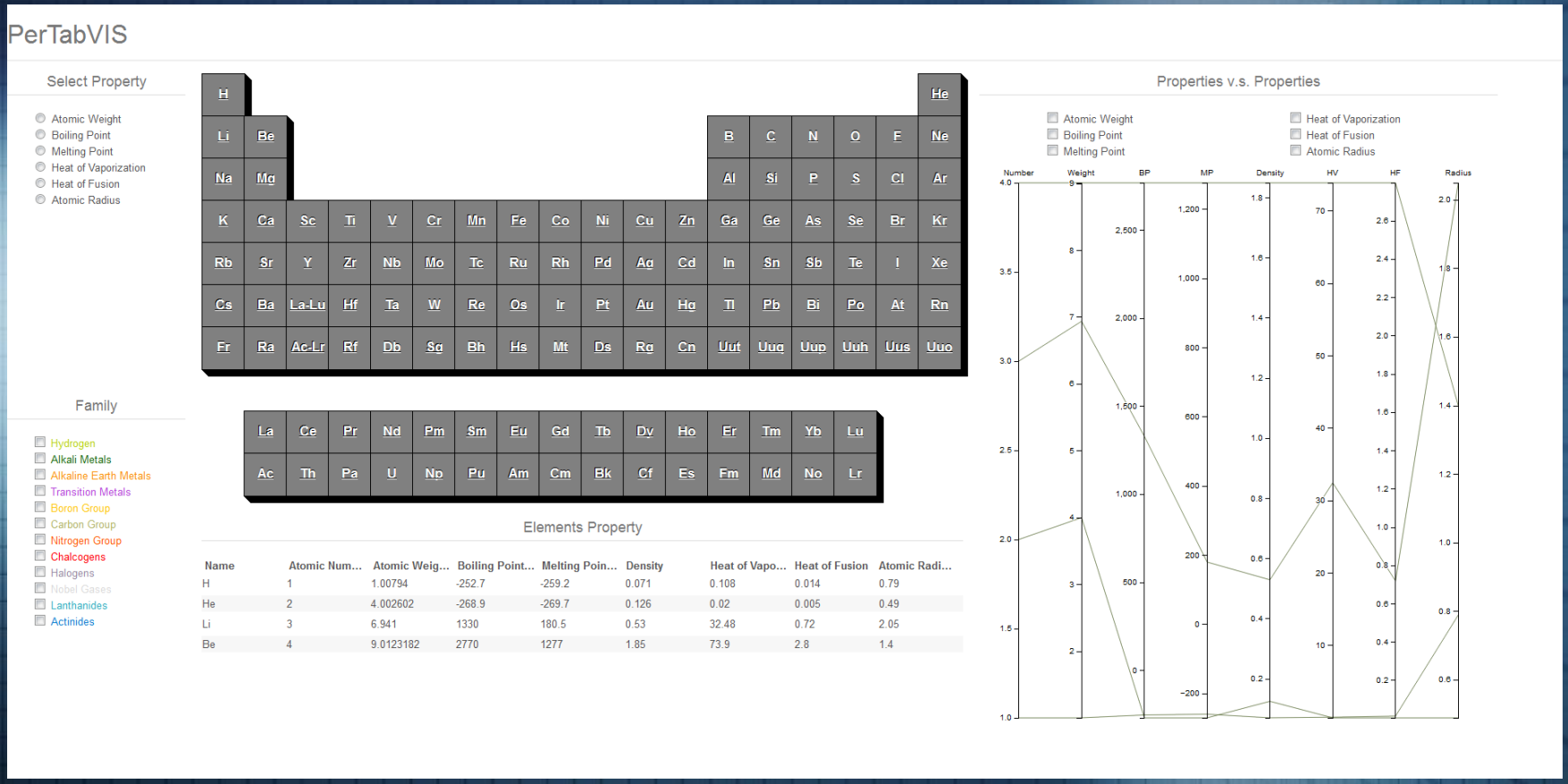
Progress

- Dataset extraction
  - Get original dataset from "*elements*" example on the *Improvise* website and *Wikipedia*
  - Abstract dataset for general use

Atomic Number	Sy...	Name	Famil...	Atomic We...	Boiling P...	Melting P...	Density	Heat of ...	Heat of F...	Atomic Ra...	Crystal S...
1	H	hydrogen	0	1.00794	-252.7	-259.2	0.071	0.108	0.014	0.79	hexagonal
2	He	helium	9	4.002602	-268.9	-269.7	0.126	0.02	0.005	0.49	hexagonal
3	Li	lithium	1	6.941	1330	180.5	0.53	32.48	0.72	2.05	body-cent...
4	Be	beryllium	2	9.0123182	2770	1277	1.85	73.9	2.8	1.40	hexagonal
5	B	boron	4	10.811	NaN	2030	2.34	128	5.3	1.17	rhombohedral
6	C	carbon	5	12.0107	4830	3727	2.26	171.7	NaN	0.91	hexagonal
7	N	nitrogen	6	14.00674	-195.8	-210	0.81	0.666	0.086	0.75	hexagonal
8	O	oxygen	7	15.9994	-183	-218.8	1.14	0.815	0.053	0.65	cubic
9	F	fluorine	8	18.9984032	-188.2	-219.6	1.505	0.755	0.061	0.57	cubic
10	Ne	neon	9	20.1797	-246	-248.6	1.2	0.422	0.08	0.51	face-cent...
11	Na	sodium	1	22.98977	892	97.8	0.97	24.12	0.62	2.23	body-cent...
12	Mg	magnesium	2	24.305	1107	650	1.74	32,517	2.14	1.72	hexagonal
13	Al	aluminum	4	26.981538	2450	660	2.7	67.9	2.55	1.82	face-cent...
14	Si	silicon	5	28.0855	2680	1410	2.33	40.6	11.1	1.46	face-cent...
15	P	phosph...	6	30.973762	NaN	NaN	NaN	NaN	NaN	1.23	monoclinic
16	S	sulfur	7	32.066	444.6	119	2.07	3.01	0.34	1.09	orthorhombic
17	Cl	cllorine	8	35.4527	-34.7	-101	1.56	2.44	0.77	0.97	orthorhombic
18	Ar	Arargon	9	39.948	-185.8	189.4	1.4	1.56	0.281	0.88	facce-cen...
19	K	potassium	1	39.0983	760	63.7	0.86	18.9	0.55	2.77	body-cent...
20	Ca	calcium	2	40.078	1440	838	1.55	36.74	2.1	2.23	face-cent...

Progress

- PerTabVIS



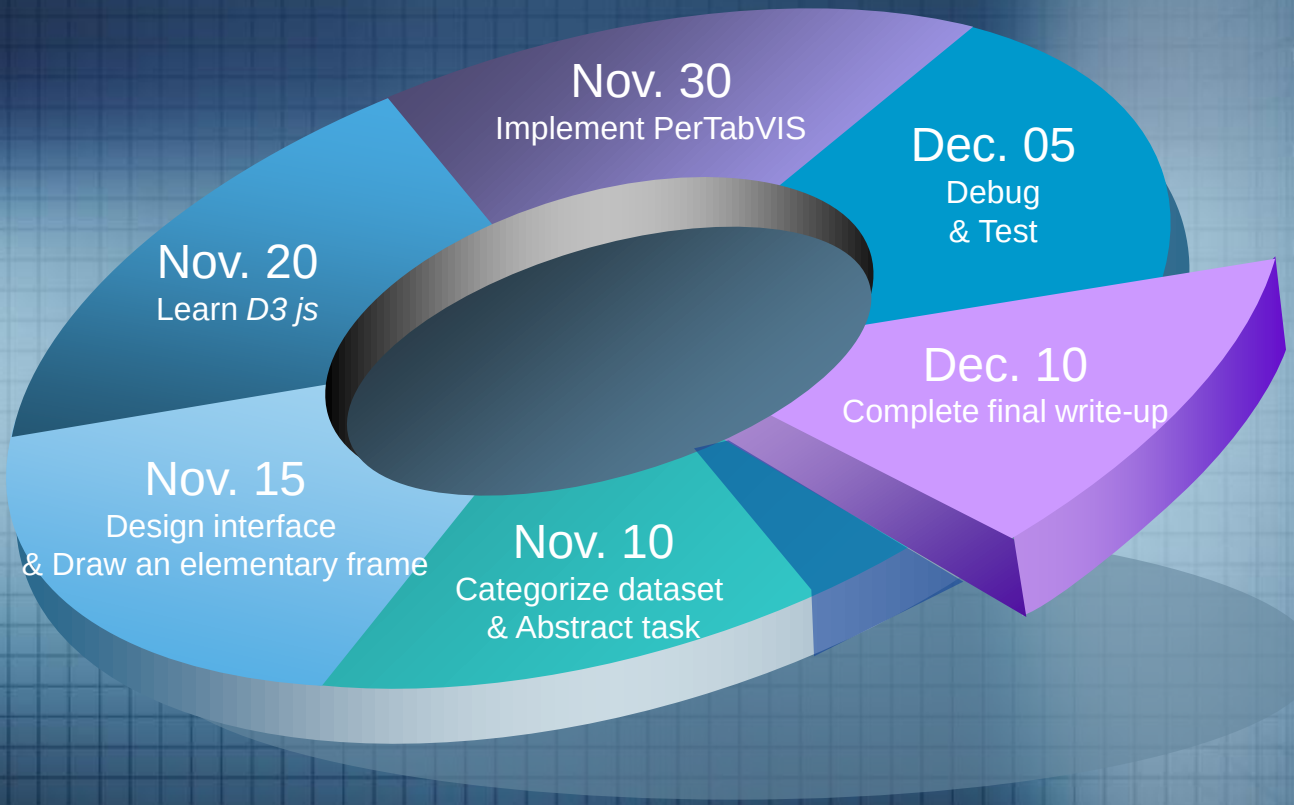
Future Work

- To-do list
  - How about if there is no value for a property? Or say that it doesn’t exist.
  - Comparison for any element with any property.
  - Corresponding connection among different panels.
  - Compatibility and performance under different browsers.

Future work

Browser	Performance	
	Speed	Validity
Chrome	Fast	High
IE	Fast	Low
Firefox	Low	High
Opera	Fast	Low

Milestone


Nov. 30
Implement PerTabVIS
Dec. 05
Debug
& Test
Nov. 20
Learn *D3 js*
Dec. 10
Complete final write-up
Nov. 15
Design interface
& Draw an elementary frame
Nov. 10
Categorize dataset
& Abstract task

Q & A

Thank You !