MAT 259: Project 2

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Concept Overview: "Lifespan of Books at the Seattle Public Library"

I would like to show the relationships between the first checkout date and the last checkin date at the Seattle Public Library. Overall, this will show the “lifespan” of books at the SPL. By connecting their first checkout date to the last checkin date, the resulting vectors tells how long the book was in use by readers in Seattle. A long line means the book was used for a long period of time, while a short line means it was used for a short period of time. I am also considering popularity of the books as a key variable in my visualization by dividing the data into categories based on their number of checkouts over time and coloring them based on it.

Query

```
SELECT DISTINCT
    #(A.bibNumber),
    B.title,
    MONTH(A.first_cout) AS x_0,
    DAY(A.first_cout) AS y_0,
    RIGHT(YEAR(A.first_cout),2) AS z_0,
    MONTH(A.last_cin) AS x_1,
    DAY(A.last_cin) AS y_1,
    RIGHT(YEAR(A.last_cin),2) AS z_1,
    B.item_cat,
    A.number_checkouts
FROM
    (SELECT DISTINCT
        (bibNumber), MIN(cout) AS first_cout, MAX(cin) AS last_cin, COUNT(cout) as number_checkouts
    FROM
        spl_2016.inraw
    GROUP BY 1
    LIMIT 10000) A
        INNER JOIN
    (SELECT
        bibNumber,
            title,
            CASE
                WHEN itemtype LIKE '%bk' THEN 'book'
                WHEN itemtype LIKE '%cd' THEN 'cd'
                WHEN itemtype LIKE '%per' THEN 'magazine'
                WHEN itemtype LIKE '%dvd' THEN 'dvd'
                WHEN itemtype LIKE '%vhs' THEN 'video (vhs)'
                ELSE 'other'
            END item_cat
    FROM
        spl_2016.inraw) B ON A.bibNumber = B.bibNumber

WHERE
    YEAR(A.first_cout) > 2005
```

Data

title	x_0	y_0	z_0	x_1	y_1	z_1	item_cat	number_checkouts
Rembrandt paintings	6	26	6	11	19	7	book	5
Filipino reaction to American rule 1901 1913	1	22	6	10	18	12	book	10
residual years poems 1934 1948 The pre Catholic poetry of Brother Anton	1	12	7	7	19	8	book	2
Palimpsest	6	23	7	6	3	11	book	6
sporting world of Jim Murray	10	10	11	11	24	18	book	4
Playing pro football to win	3	11	14	5	3	14	book	1
One hundred years of anthropology	6	19	6	3	14	16	book	6
early poetry of Ezra Pound	3	3	6	8	25	15	book	2
Roman laughter the comedy of Plautus	8	16	6	11	30	9	book	10
Theory and analysis of flight structures	6	8	6	6	15	6	book	1
little drummer boy	1	2	6	12	29	6	other	11
Whiskey Rebellion 1794 revolt in western Pennsylvania threatens America	2	27	6	10	25	10	book	4
Byzantine enamels from the 5th to the 13th century	6	26	8	6	17	10	book	4
baroque principles styles modes themes	2	18	6	10	18	16	book	14
destruction of Convoy PQ 17	9	22	7	7	30	9	book	3
pencil of nature	12	29	6	2	26	7	book	1
Power in the House a history of the leadership of the House of Represent	2	1	6	11	9	7	book	2
Modern times cartoons from the Wall Street journal	5	3	6	5	8	6	book	1
Murder for pleasure the life and times of the detective story	2	25	6	4	18	11	book	16
Costume in detail womens dress 1730 1930	1	16	11	1	24	11	book	1
Imperial Hotel Frank Lloyd Wright and the architecture of unity	11	13	10	4	10	21	book	3
Thornton Wilder	4	21	7	11	7	9	book	4
theological novel of modern Europe an analysis of masterpieces by eight	2	18	6	12	12	16	book	16
Theres always another windmill	4	20	7	4	17	9	book	6
North Carolina gazetteer	7	28	6	8	21	6	book	1
making of economic society	10	4	8	3	28	11	book	4
Team 10 primer	3	6	6	3	14	6	book	1
Portraits by Karsh	3	14	11	4	28	11	book	1
Art centers of the world Rome	10	11	8	6	27	11	book	5

- All book itemtype!
- 5,589 Rows
- 9 Columns
- (Month, date, year) first checkout
- (Month, date, year) last checkin
- Number of checkouts of all time

Functions added to 3D Visualization

- Color of Vector based on number of checkouts (5 sets)
- Linear gradient from min(checkout) to max(checkout)
  - Light to dark color
- Keyboard & Camera functions
  - Remove/add points on the end of the vectors
  - Only look at certain sets of checkout groups
  - Remove text on screen (legend and titles)
  - Rotation of X/Y/Z axis
- Labeled X, Y, and Z axis
  - X = month of year
  - Y = day of month
  - Z = last two digits of the year (i.e 2023 → 23)

Visualization

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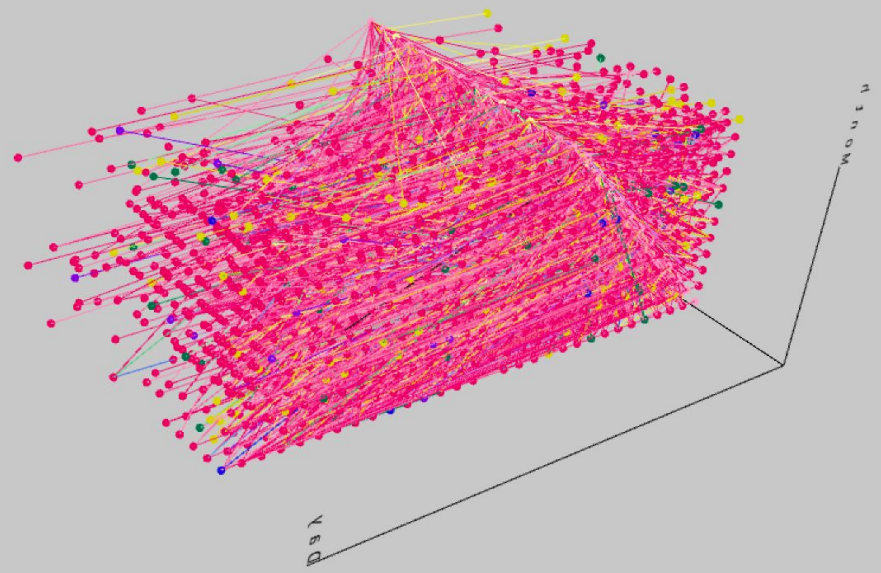
Camera Functions:
'<' & '>': rotate the X axis
'w' & 's': rotate the Y axis
'o' & 'i': rotate the Z axis



Keyboard Functions:
'p' - removes/adds points
'1' - removes/adds data with 1 ≤ checkouts ≤ 10
'2' - removes/adds data with 11 ≤ checkouts ≤ 20
'3' - removes/adds data with 21 ≤ checkouts ≤ 30
'4' - removes/adds data with 31 ≤ checkouts ≤ 40
'5' - removes/adds data with checkouts ≥ 41
'x' - removes text on screen

Color Legend:
1 ≤ checkouts ≤ 10
11 ≤ checkouts ≤ 20
21 ≤ checkouts ≤ 30
31 ≤ checkouts ≤ 40
checkouts ≥ 41