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Module: CS7DS4
Declaration:
I understand that this is an individual assessment, and that collaboration is not permitted. I have read and I understand the plagiarism provisions in the General Regulations of the University Calendar for the current year, found at http://www.tcd.ie/calendar. I understand that by returning this declaration with my work, I am agreeing with the above statement.

ASSIGNMENT 3

For the novel visualization project, I have used **Tableau**, a interactive visualization software used for visualizing and analyzing vast volumes of data, to create an interactive dashboard to help take insights from the historical sales of video games over a number of platforms.

The dataset I have used is taken from Kaggle and submitted in the zip file along with this report.

About the dataset:
The dataset contains approximately 12,000 unique values with columns as:
Name : This is the name of the game released
Platform: The gaming platform it is released on such as PC, PlayStation, etc.
Year_of_release: This is the year the game has been released
Genre: This is the type of the game whether it is action, adventure, etc.
Publisher: This is the company who published this game
NA_sales: The revenue generated by selling the game in North America
EU_sales: The revenue generated by selling the game in Europe
JP_sales: The revenue generated by selling the game in Japan
Other_sales: The revenue generated by selling the game in other parts of the world
Global_sales: The revenue generated by selling the game in total

All the sales values are **quantitative measure** values. While **year_of release** is a discrete **quantitative attribute** ranging from 1980 to 2016. **Genre, platform and publisher** are **categorical attributes**.

Task:
This is a data **explanatory visualization**. With the help of this visualization, we can clearly see which platform has the most amount of video games sales. By this we can see which all platforms are more popular among the video games user. In this PS2, a play station variant, has the most games sold. We can also see which type of games (genre specific) is more sold historically which tell us what type of games is usually played among the users. This has action-oriented games as the highest seller. For a new game to be released this can be a crucial information for which platform to be released on or for a publisher which type of game they should publish to generate more revenue. Since this is an interactive dashboard, which genre is sold more according to a specific platform can also be seen. This helps the publishers to compare by releasing game on a specific platform which can be more revenue generating.

Moreover, the revenue generated by top publishers have also been visualized for the publishers to see which year they have made the most revenue in and what needs to be done to make more profit in the upcoming years by considering the above factors.

Encoding Channels:
Color: This is done by depicting the different platforms, genre, and publishers with different colors to create a clear understanding of trend lines and difference among each other
Line length: To compare the in the amount of a game sold in different genre and platform
Text: To give an understanding of the dashboard
Text Label: To tell the years and the sales done by the publisher
Position: For placing line segments in descending order to give clear understanding of which genre games are sold the most and which platform have the most games sold.

Idioms:
Data (What?) : A tree/ dendrogram chart with platform and genre at Y-axis and amount of games sold at X-axis. **(2 Categorical attributes and 1 Quantitative measure)**
Encoding (How?) : Expressed **quantitative measure** with **position and length** and the **categorical attribute** with **color**
Task (Why?) : Identify and compare the amount of games sold specific to different genre and platforms.

Novelty:
The charts in dashboard have a combinations of encoding and moreover it has interactive view for the user. The dendrogram is complex to create as it requires bins to create and then adjusted parameters to act accordingly. This gives the clear separation of the total video game sales industry in different genre and video games platform.

Critical Analysis:
This is particularly strong in the area if we want to release a game for a specific platform then which type of game genre a publisher should publish a game for as different platform require different types of games. For ex: Wii is more popular in simulation games while PlayStation is more popular in action games. So, this helps to give an understanding to the publisher for which type of game should it release for which type of platform.
For the weakness, this line chart is a bit hard to understand when clustering of line happens.

Reference:

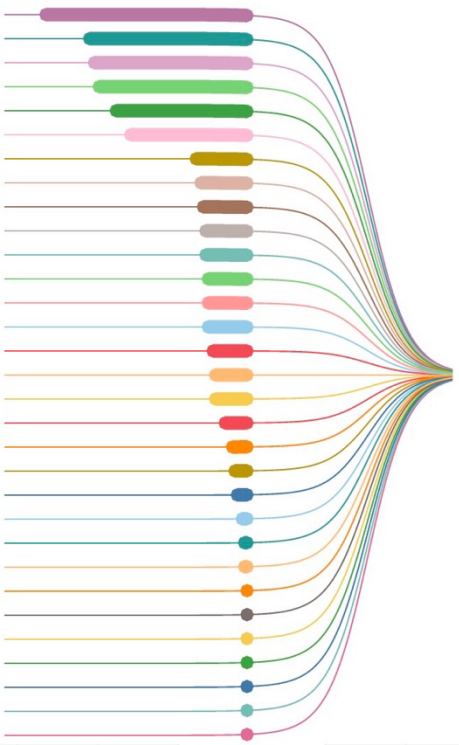
1) https://paperswithcode.com/paper/learning-graph-representations-by-dendrograms
2) https://arxiv.org/pdf/2206.01703.pdf
3) https://vizartpandey.com/multi-level-dendrograms-with-bar-chart/
4) https://wandb.ai/stacey/weather/reports/How-To-Customize-Trees-and-Dendrograms-in-Weights-Biases--VmlldzozNDYyMDk

Video Game Sales Visualization

This Dashboard helps us to clearly understand how much amount of value has been spent on video games up till 2016. The sale of games across different platforms and genre is also illustrated. Moreover the revenue generated by top publishers over the years have also been visualized. This clearly shows us how much popular a game can be if released on a particular platform or in a genre or by a publisher.

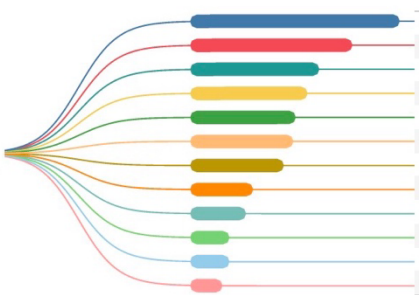
Europe	North America	Japan
$4,868	$8,786	$2,582
in million	in million	in million

Platfo..	T..	EU	Japan	NA	Othe..
PS2	2,511	679	278	1,168	387
X360	1,960	561	25	1,202	171
PS3	1,916	687	160	785	284
Wii	1,853	537	139	1,015	161
DS	1,645	389	351	781	121
PS	1,461	427	280	673	82
GBA	637	151	95	375	15
PSP	593	137	154	218	84
PS4	556	247	29	194	87
PC	518	279	0	187	50
XB	517	122	3	373	17
GB	511	96	170	229	16
NES	502	42	197	252	11
3DS	495	117	195	158	25
N64	438	82	68	278	9
SNES	400	38	233	122	6
GC	399	77	43	267	10
XOne	282	91	1	166	24
2600	194	11	0	181	2
WiiU	164	48	26	77	13
PSV	124	33	42	32	17
SAT	67	1	65	1	0
GEN	57	11	5	39	2
DC	32	3	17	11	1
SCD	4	1	1	2	0
NG	3	0	3	0	0
WS	3	0	3	0	0
TG16	0	0	0	0	0
3DO	0	0	0	0	0
GG	0	0	0	0	0
PCFX	0	0	0	0	0

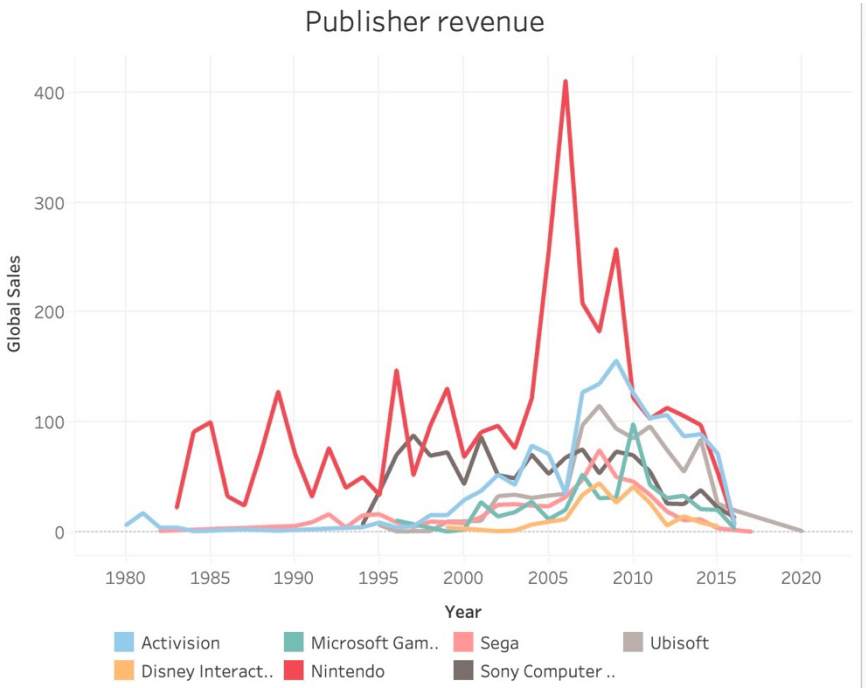


The video game industry has been one of the highest revenue generating industry as it is popular among not only childern but also adults

$17,841
in millions



Genre	T..	EU	Japan	NA	Oth..
Action	3,502	1,050	320	1,756	375
Sports	2,662	754	271	1,367	270
Shooter	2,075	627	77	1,165	205
Role-Playing	1,855	376	705	655	119
Platform	1,663	403	262	894	103
Misc	1,620	432	216	820	151
Racing	1,464	477	113	719	155
Fighting	898	203	175	447	73
Simulation	784	227	127	367	63
Puzzle	490	102	115	248	25
Adventure	478	128	104	212	34
Strategy	350	91	99	137	23



This Dendrogram chart, visualizes the sales of video games across different genre and platforms. There are a total of 31 different gaming platform including pc, ps, and xbox etc. Apart from this 12 video game genres are visualized.