

Making Better Game Recommendations



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How to Find More Games You'll Like?

Frequently I'll find myself having finished a game without another one lined up to play. Sometimes I'll want to play something similar to what I just beat, sometimes I'll get a craving to play a particular genre. The only common theme is that my ability to find good recommendations rarely come from the platforms where I get my games.

Examples



Grand Theft Auto V	Search	Sort by	Relevance
103 results match your search.			
	Grand Theft Auto V	Apr 13, 2015	
	Grand Theft Auto V: Premium Edition		\$14.80
	Grand Theft Auto V: Complete Edition		
	Grand Theft Auto V - Criminal Enterprise Starter...	Dec 14, 2017	\$9.99
	Grand Theft Auto V: Premium Edition & Great ...		\$27.60
	Grand Theft Auto V: Premium Edition & Megalo...		\$64.40
	Grand Theft Auto	Jan 4, 2008	
	Grand Theft Auto 2	Jan 4, 2008	
	Grand Theft Auto V: Premium Edition & Whale ...		\$37.80
	Grand Theft Auto: Episodes from Liberty City	Apr 13, 2010	
	Red Dead Online	Dec 1, 2020	\$19.99
	STRTKING-Beta v1.3.0	Jul 27, 2020	\$39.99
	Memory Card Monsters - Expanded Content 5	Sep 15, 2020	\$0.99
	Fantasy Memory Card Game - Expansion Pack 5	Mar 19, 2020	\$0.99
	Sedition: Tower Defense	Nov 18, 2020	Free To Play
	APB Reloaded	Dec 6, 2011	Free to Play
	Hillside	Nov 2020	
	Streatham Hill Stories	Oct 23, 2020	\$4.99
	Hijack Overdrive	February 2022	
	Retro City Rampage™ DX	Nov 11, 2014	\$14.99
	Rock 'N' Roll Defense	Aug 10, 2016	\$0.99

Monster Hunter: World	Search	Sort by	Relevance
366 results match your search. 1 title has been excluded based on your preferences. However, this title would not have appeared on the first page of results.			
	Monster Hunter: World	Aug 9, 2018	\$29.99
	Monster Hunter World: Iceborne	Jan 9, 2020	\$39.99
	Monster Hunter World: Iceborne Deluxe Kit	Jan 9, 2020	\$14.99
	Monster Hunter: World - Deluxe Kit	Aug 9, 2018	\$9.99
	Monster Hunter World: Iceborne Master Edition		\$59.98
	Monster Hunter: World - Gesture: Hadokent	Sep 30, 2020	\$3.99
	Monster Hunter: World - Gesture: Shoryuken	Sep 30, 2020	\$3.99
	Monster Hunter: World - Gesture: Sleep	Aug 9, 2018	\$1.99
	Monster Hunter: World Original Soundtrack	Aug 9, 2018	\$24.99
	Monster Hunter World: Iceborne Digital Deluxe		\$49.98
	Monster Hunter: World - DLC Selection		\$35.20
	Monster Hunter: World - Gesture Pack		\$20.24
	Monster Hunter: World - Sticker Pack		\$8.91
	Monster Hunter: World - Pose Set: Crouching	Jan 9, 2020	\$3.99
	Monster Hunter: World - Pose Set: Unique	Jan 9, 2020	\$3.99
	Monster Hunter: World - Gesture: Feverish Dance	Oct 4, 2018	\$3.99
	Monster Hunter World: Iceborne - Pendant: Ful...	Jul 8, 2020	\$0.99
	Monster Hunter: World - Gesture: Cool Dance	Nov 29, 2018	\$1.99
	Monster Hunter: World - Gesture: Disco Fever	Oct 4, 2018	\$1.99
	Monster Hunter: World - Hairstyle: Provisions M...	Nov 11, 2020	Free to Play

Cave Story	Search	Sort by	Relevance
290 results match your search. 1 title (including <i>Treasure of Nadia</i>) has been excluded based on your preferences.			
	Cave Story's Secret Santa	Dec 10, 2021	Free
	Cave Story-	Nov 22, 2011	\$14.99
	Fantasy Grounds Unity	Nov 5, 2020	\$39.99
	The Mammoth: A Cave Painting	Nov 22, 2017	Free
	Nancy Drew®: The Creature of Kapu Cave	Jul 17, 2009	\$6.99
	The Beast In The Cave	几周内	
	Caves of Qud	Jul 15, 2015	\$14.99
	Crystal Story Bundle		\$6.78
	Mysteries of Shaola: The Cave	2021	
	Jet-Story 2018	Jul 3, 2018	Free
	Cave Escape	Jan 22, 2018	\$0.99
	Park Story	H1 2022	
	Cave Brawlers	Jan 15, 2018	\$6.99
	Aurora: The Lost Medallion - The Cave	TBA	
	A Small Robot Story	Dec 20, 2017	Free
	BlackEye & Halloween Pumpkin Story		\$4.88
	Elder Scrolls Summer Bundle		\$67.47
	The Lost Cave of the Ozarks	Oct 26, 2019	\$7.99
	THE LONGING	Mar 5, 2020	\$14.99
	DISGAEA RPG	Nov 30, 2021	Free To Play
	Nancy Drew®: The Creature of Kapu Cave Demo	Jul 3, 2009	Free Demo

How to Find More Games You'll Like?

- Look for new titles from series or developers I've played games from before.
- Word of mouth from friends or message boards
- Occasional playthroughs from content creators that hit my feed

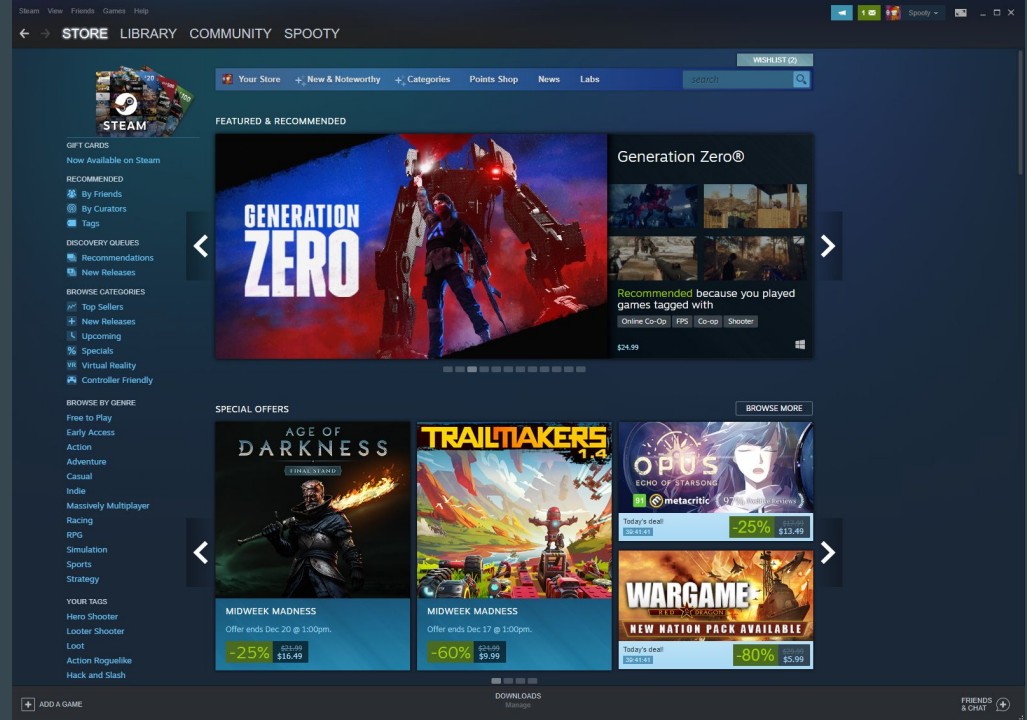
Instead I'd like to take the reigns and see if I can build something that can make more intelligent recommendations! Since I've already picked on Steam so much we'll focus on Valves Platform to try and improve!

Steam Background Information

Created by Valve (Developers of several titles including Half-Life, Counter-Strike and Portal)

Largest video game digital distribution platform in business

Held 75% of the market share in 2013 and processed at least 18% of global PC game sales in 2017

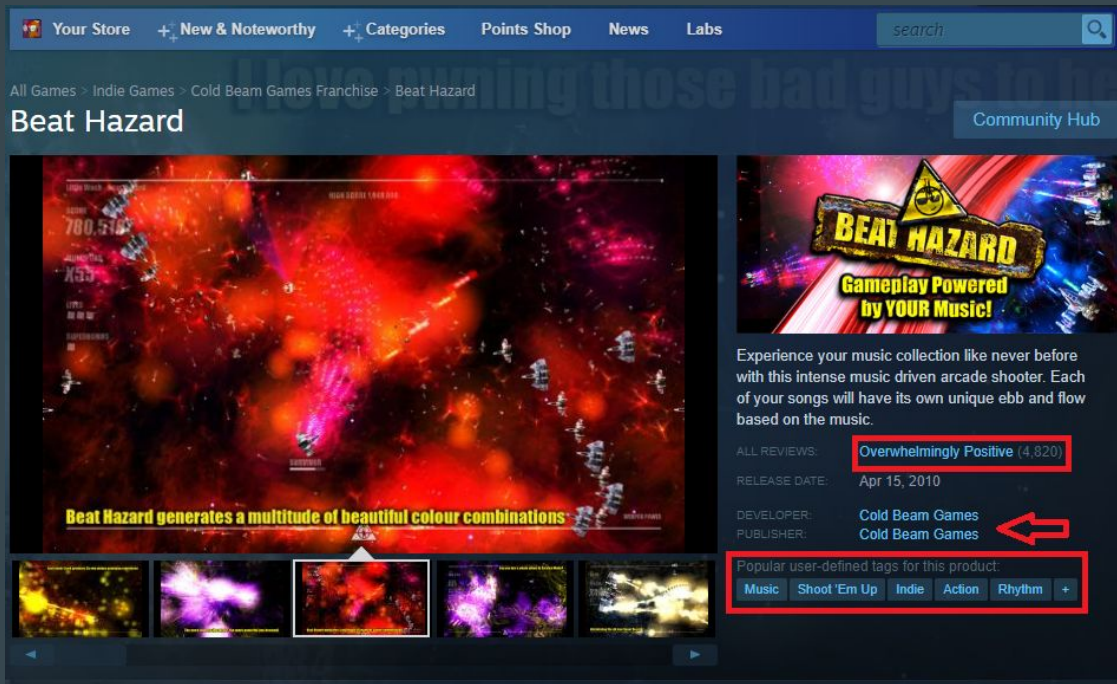


Data Collection

Game information was collected using the Steam Spy API to get a condensed and complete list of information from each game, alongside Steam's own API to get a list of all available games on steam as of November 23rd 2021

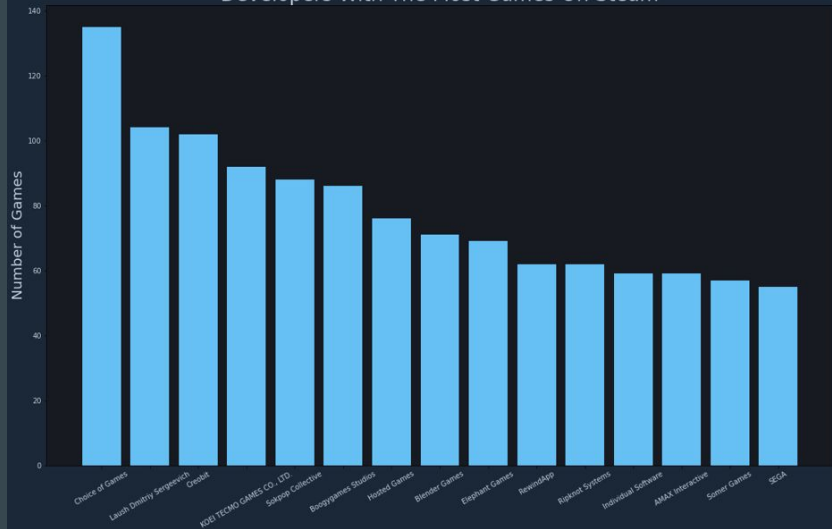
Available data includes:

- Positive and Negative Review counts
- Developer and Publisher
- Tags and number of times each tag was received
- Supported Languages

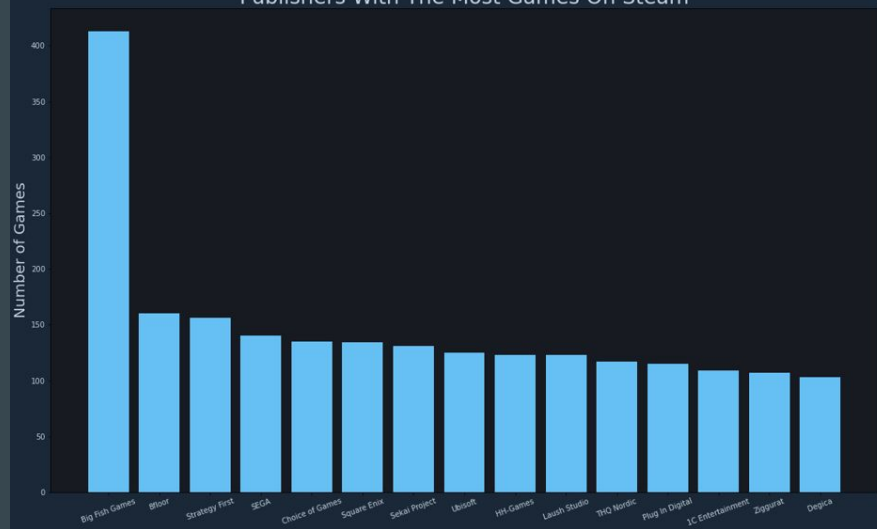


Top Developers and Publishers

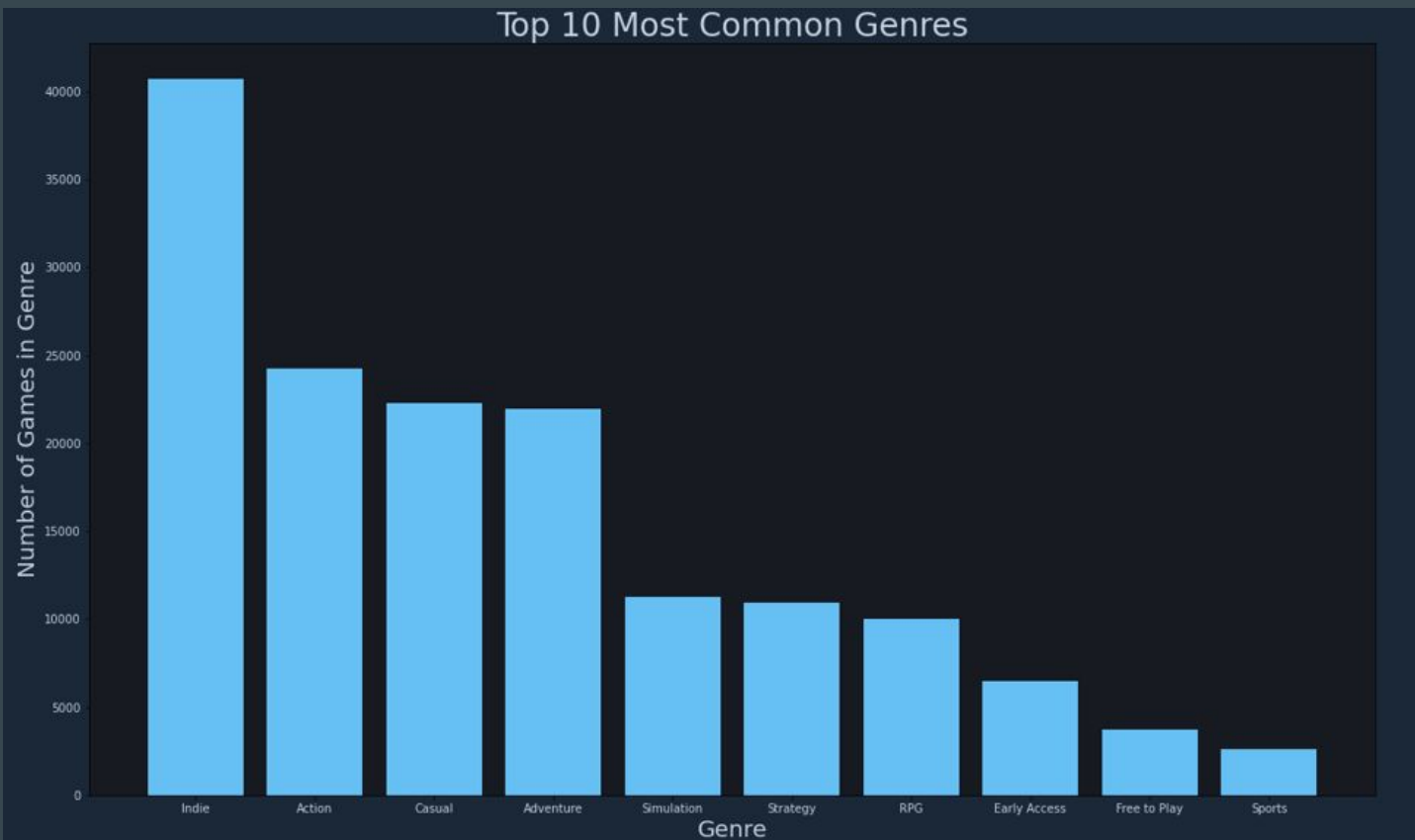
Developers With The Most Games On Steam



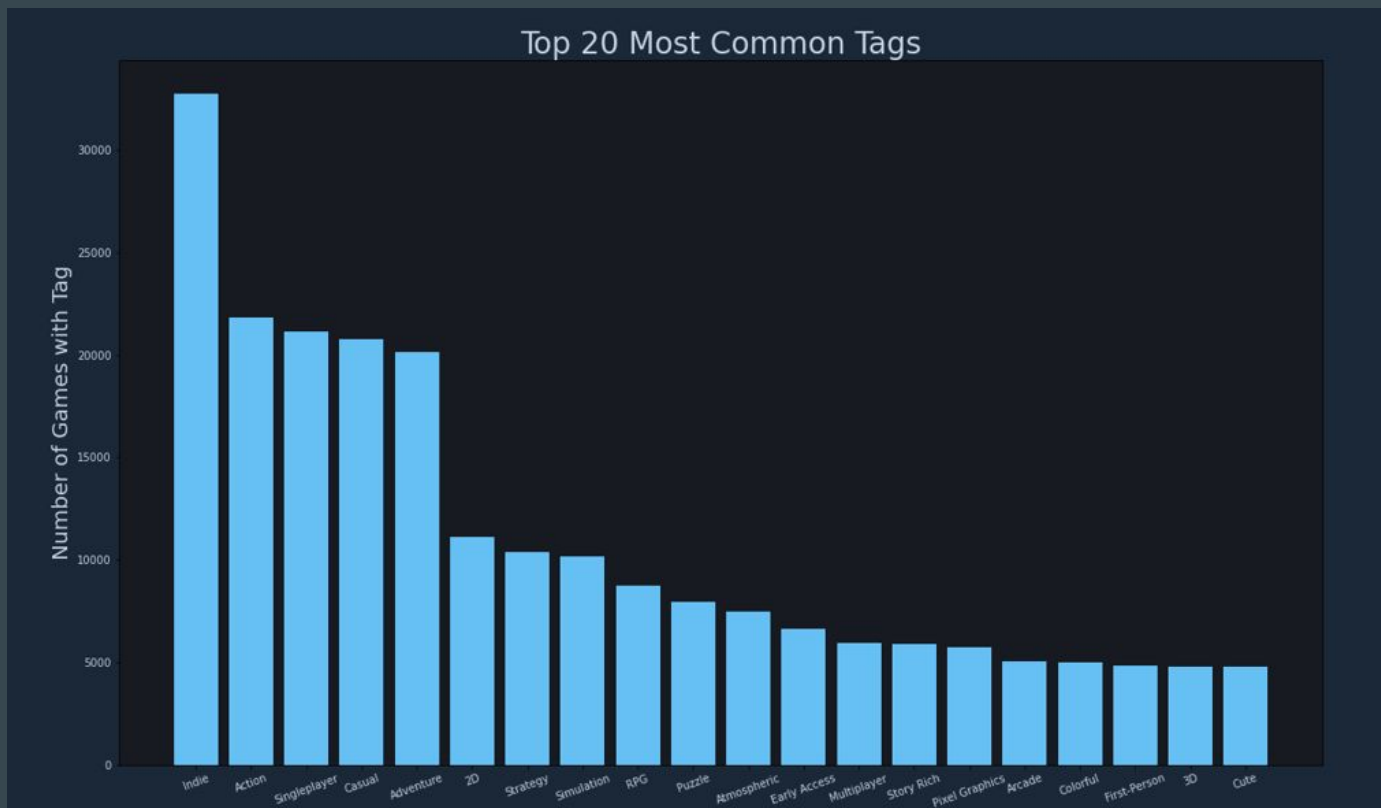
Publishers With The Most Games On Steam



Top Genres



Top Tags



Creating a Recommender

The biggest challenge was deciding which data to use to achieve the best results. Ultimately tags were chosen due to them being both the most specific and also diverse data point.

To help games with fewer total tags measure up to games with much larger tag counts every game was scaled based off the highest tag count it received.

The scaled tag values were then all compared to each other in a pairwise distance algorithm to compare which games were tagged the most similarly by users!

Example tags and tag counts for the game Counter-Strike:

Action	5371
FPS	4795
Multiplayer	3356
Shooter	3321
Classic	2751
Team-Based	1839
First-Person	1688
Competitive	1585
Tactical	1318
1990's	1177

e-sports	1170
PvP	861
Old School	744
Military	622
Strategy	607
Survival	294
Score Attack	285
'1980s',	256
Assassin	222
Violent	63

Let's Try it out!

[https://share.streamlit.io/jeffreyfloyd/steam-game-recommender
/streamlit_recommender.py](https://share.streamlit.io/jeffreyfloyd/steam-game-recommender/streamlit_recommender.py)

Conclusions

User tags are incredibly effective at helping users find similar games. The algorithm had already generated a successful game sale before it was fully deployed.

Based on early performance I'd recommend Valve look into implementing a similar system to help gamers everywhere find the games they'll enjoy the most!

Limitations

- Currently only top 100 closest games are available due to hardware and file size limitations
- Games without any tags are unable to be considered
- Less popular games still need a bit more representation
- Users still need to have a game in mind to play
- Can only search games available on the Steam Store
 - Series that are spread across different platforms aren't represented well

Future Updates

- Implement a filter search to help find a starting point for those who haven't used Steam before
- Expand to other platforms:
 - itch.io
 - Epic Games Store
 - Humble Bundle
- Explore Mean Average Precision as a scoring metric
 - Difficult with data in its current form
 - Would need feedback from those using the app
- Improve mature content filter and allow users more control of the results they receive

Questions?

Resources

[https://en.wikipedia.org/wiki/Steam_\(service\)](https://en.wikipedia.org/wiki/Steam_(service))

<https://steamspy.com/>

<https://partner.steamgames.com/doc/webapi>

<https://store.steampowered.com/>