



# How did the COVID-19 pandemic affect Steam gamers' behavior?

BANA 212

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# 1. Project Overview

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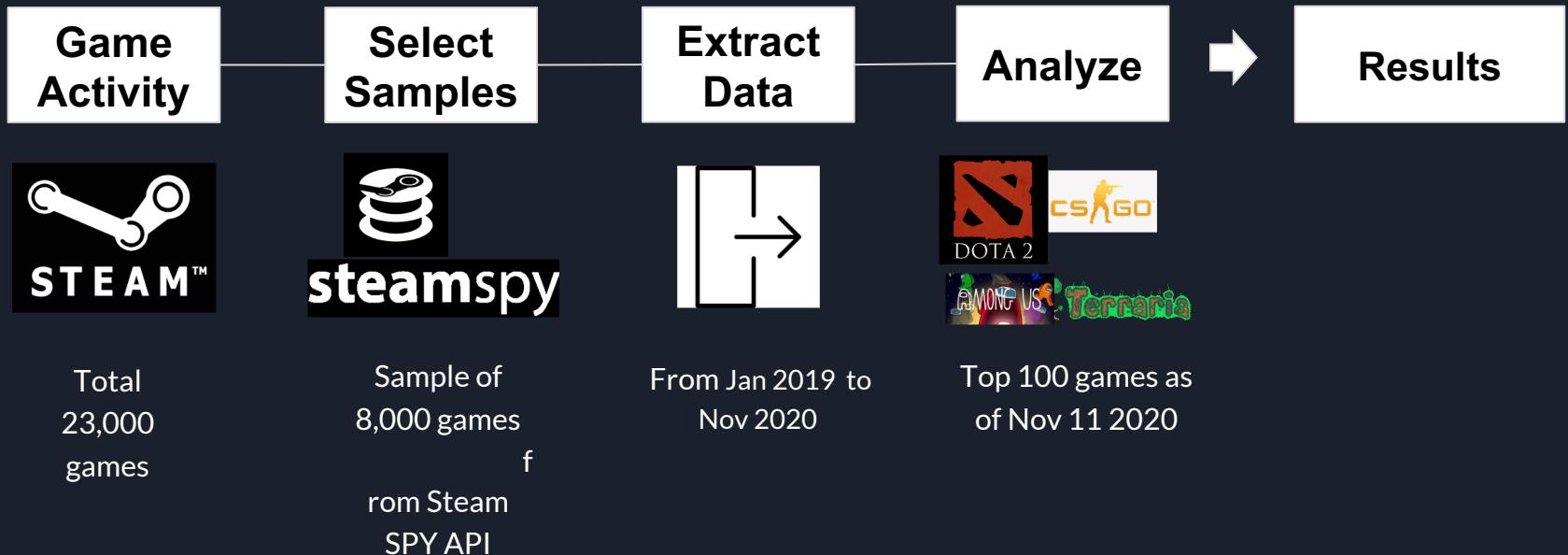
## Purpose

Study how gamer behavior changed by comparing pre-pandemic gaming activity with current engagement on Steam's online gaming platform.

## Goal

Prove that stay-at-home orders during the COVID-19 pandemic had an impact on how people interact socially and how changes in gaming behavior affected the online gaming industry

## 2. Data Processing



# 2. Data Processing

## Extracting data - Game Activity from SteamDB

**Step 1:** Add all game ID to a list

**Step 2:** Form the first dataframe and then add CSV file of all games to the dataframe through applist

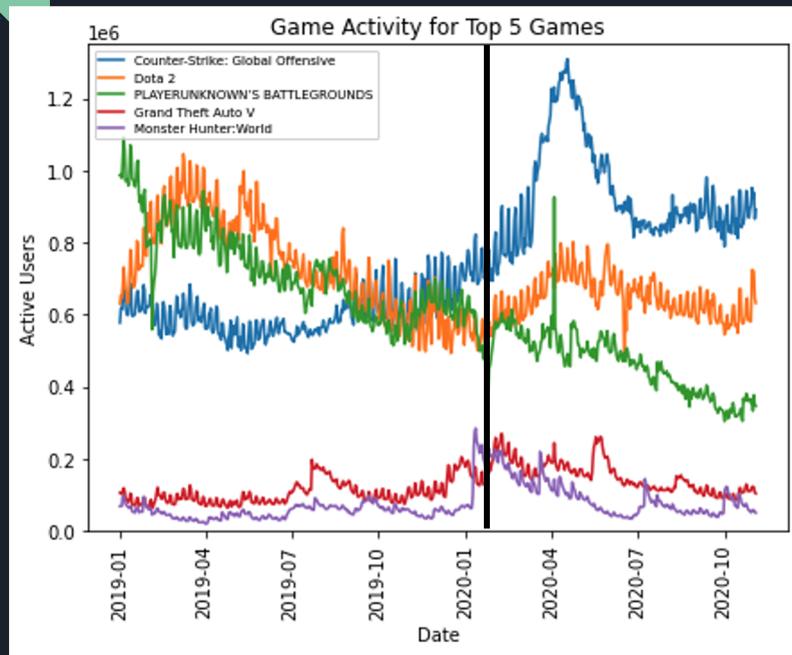
**Step 3:** Rename column and row, sort by date and time, and then extract the data from Jan 1 2019 to Nov 9, 2020

**Step 4:** Form CSV file - Game Activity

	DateTime	730	570	578080	945360	252950	271590	359550	440	252490	346110	381210	230410	218620	582010
5094	1/1/19 0:00	577546	630381	986759	18	61006	105875	115245	64808	58273	57136	32155	65855	13335	68428
5095	1/2/19 0:00	617293	653543	988726	16	60990	104300	116029	58697	51449	53143	34005	67282	14603	68731
5096	1/3/19 0:00	614938	645297	978611	23	59801	102460	116388	60114	77167	51514	35899	64957	13462	68812
5097	1/4/19 0:00	648525	679515	1037423	19	62909	111765	131544	56992	84481	53324	29419	68508	13728	97343
5098	1/5/19 0:00	671521	731384	1091897	21	64783	118732	137631	61764	85218	58674	31333	73605	15223	95520
5099	1/6/19 0:00	667843	698277	1053933	20	64897	110518	125619	60095	80951	57656	30570	72659	14602	86085
5100	1/7/19 0:00	619371	669920	970440	24	60303	89989	101320	54878	66398	46501	25696	61725	13245	74593
5101	1/8/19 0:00	604350	654147	972455	9	52138	86862	100987	53917	58941	43396	25212	61032	11392	70744
5102	1/9/19 0:00	598055	631040	973687	13	51866	81376	100656	51807	55398	41539	24270	59013	11142	67649
5103	1/10/19 0:00	601609	633023	958155	14	52947	78989	98973	51883	59130	40687	23779	63171	10828	67288
5104	1/11/19 0:00	649360	695608	1002374	6	58164	89223	113337	61049	64138	45287	26313	75875	11103	63220
5105	1/12/19 0:00	687299	779866	1069995	19	60238	103999	127994	66590	74980	54644	30123	78449	14014	68826
5106	1/13/19 0:00	657620	762186	1051360	13	60502	99759	121317	58533	71326	56282	31348	75128	13664	65988
5107	1/14/19 0:00	596411	714087	975754	18	54703	72712	96645	53896	55499	42817	23376	61992	10862	54237
5108	1/15/19 0:00	595994	677102	973809	10	53466	72747	96971	54494	50641	41336	23141	60900	10925	52914
5109	1/16/19 0:00	598740	675936	962822	14	53068	71187	97432	55607	47979	40110	23450	65097	9984	51325

# 3. Data Visualization

## Game Activity (Source: SteamDB)



Top 5 most popular games:

- Counter-Strike: Global Offensive
- Dota 2
- PLAYERUNKNOWN'S BATTLEGROUNDS
- Grand Theft Auto V
- Monster Hunter: World

Fig. 1: DAU increased significantly after lockdown period (March 2020). Black line (Feb 2020) was when cases started rising around the world.

# Special Case: Among Us

- Provided a way to virtually interact with anyone and anywhere, as long as they have internet access
- Easy to play
- Free on multiple platforms
- Attracted many to play the game, especially during the pandemic
- Popularity due to viral marketing (Influencer streams on Among Us)

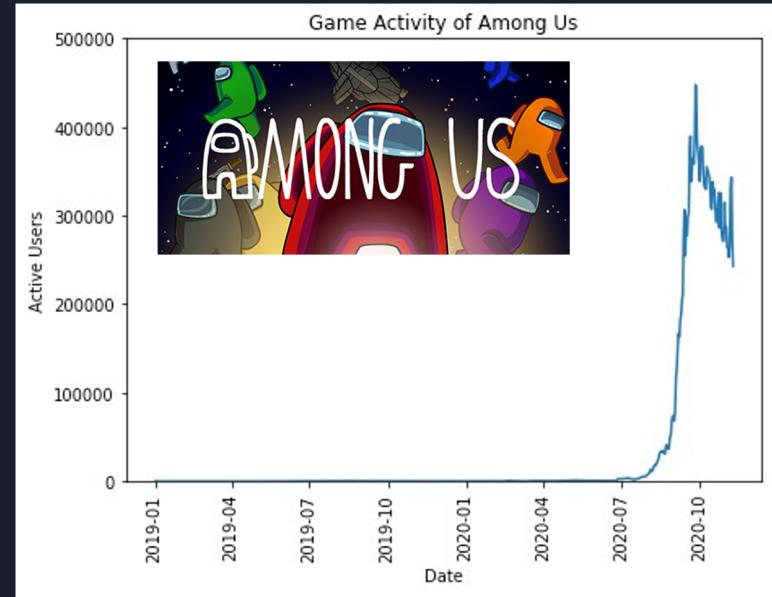


Fig. 2: Game activity for Among Us had a huge spike in September 2020

# 3. Data Visualization

## Top 100 Genres (Source: SteamSpy API)



Fig. 3a: Popular genres analyzed from Top 100 games.

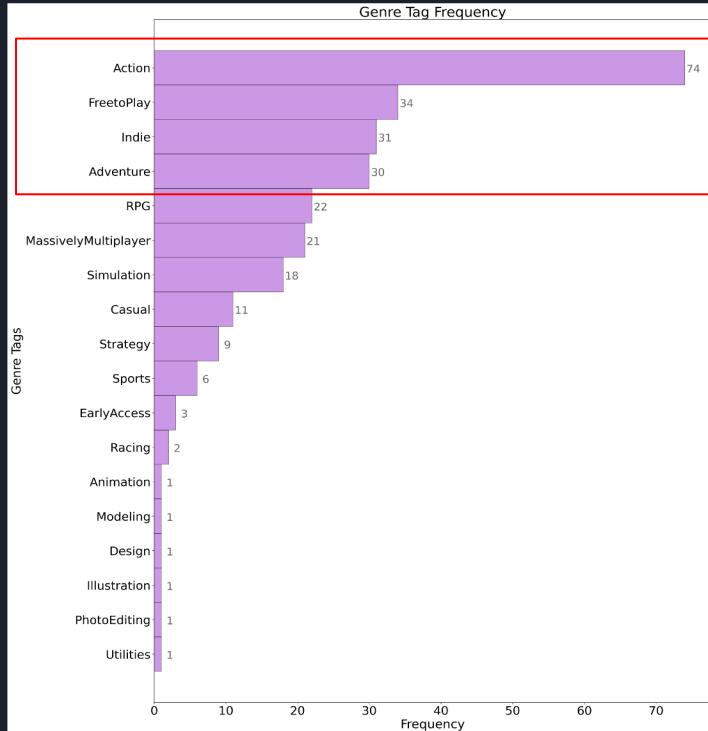


Fig. 3b: Term frequency distribution of genre that shows the type of games users are likely to play.

# 3. Data Visualization

# Top 100 User Generated Tags

(Source: SteamSpy API)



Fig. 4a: User generated tags showing that the most popular games tend to be Action, Multiplayer, and Adventure.

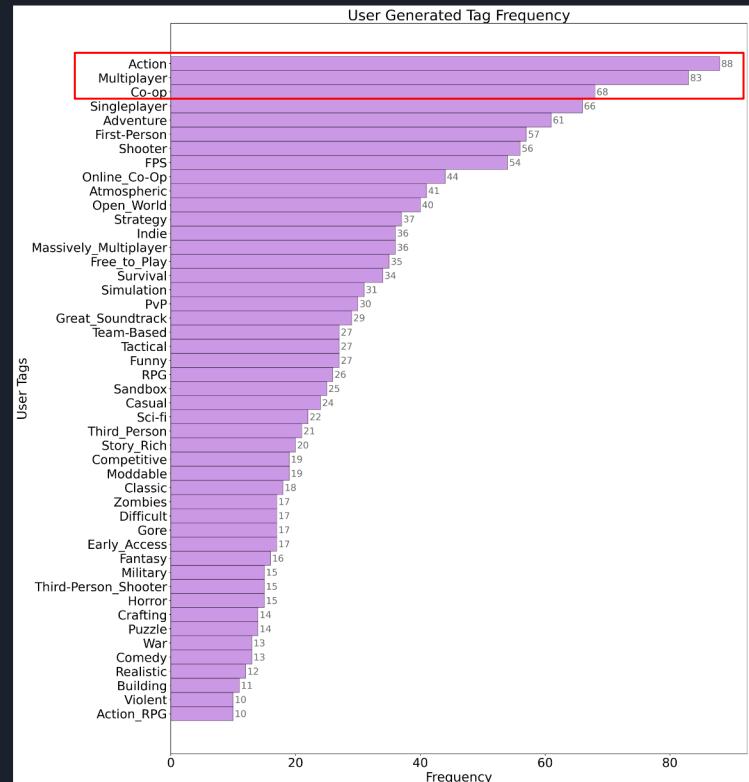


Fig. 4b: Term frequency distribution of user tags that shows popular game characteristics from the user's perspective.

# 4. Business Analysis

## Descriptive statistics

- Average price of each game: \$12.88
- Median price of each game: \$9.99

### Before pandemic

(Jan 2019 - Jan 2020)

### During pandemic

(Feb 2020 - Nov 11, 2020)

#### Revenue

- Monthly Average: \$849,091
- **Monthly Average: \$1,036,392**

#### Concurrent Users

- Daily Average: 3,291,769
- Daily Median: 3,178,021
- **Daily Average: 3,814,928**
- **Daily Median: 3,588,144**

# 5. Conclusion

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## Game Trends During The Pandemic

- **Keywords: Action, Adventure, Multiplayer, Free to play, Co-op**
- Increase in engagement and revenue as a result of COVID-19
- Saw a change in social behavior due to measures taken to slow the spread of the COVID-19 virus → **interact by virtual means**



# Thank You

*Your Feedback matters*



# Appendix

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# Extracting data - SteamSpy API

- Obtained a sample of 8,000 games
  - Attributes obtained: appid, name, developer, publisher, no. of positive and negative reviews, owners, avg\_forever, avg\_2wk, median\_forever, median\_2wk, price, initial\_price, discount, ccu
  - Steam's Top 100 games as of 11/11/2020, obtained from SteamSpy.
  - Attributes obtained: appid, name, developer, publisher, no. of positive and negative reviews, owners, avg\_forever, avg\_2wk, median\_forever, median\_2wk, price, initial\_price, discount, ccu

# Extracting data - Top 100 genres, tags

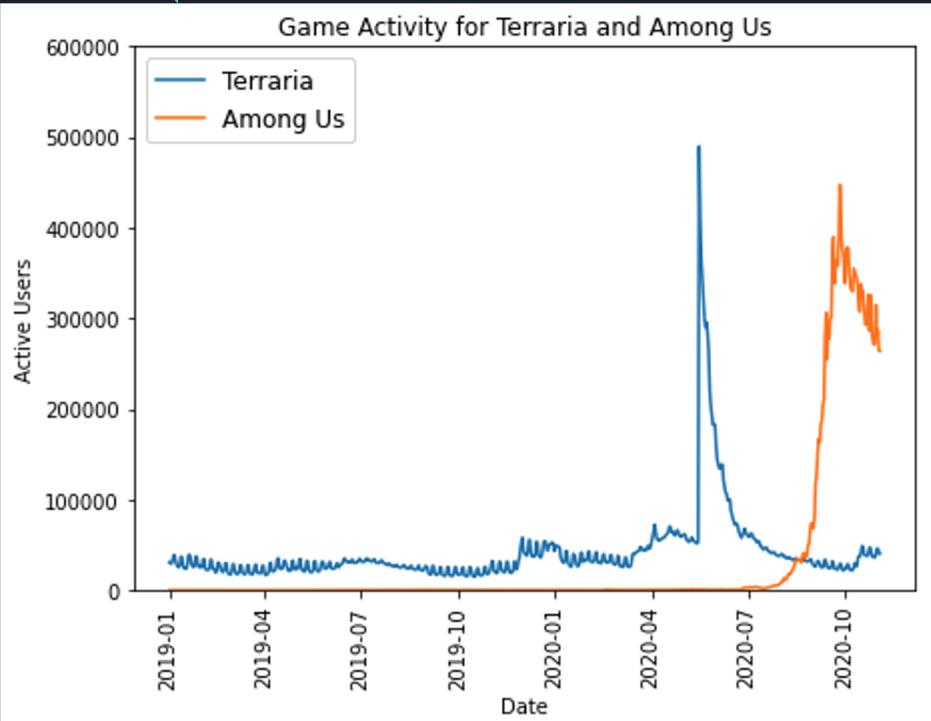
Fig. 4: Genre and tags of Top 100 games ordered by game ID, not rank.

- Genres and tags of the Top 100 games
  - Had to access individual game files, then merged genre and tags data by matching game ID from Top 100 list
  - Attributes obtained: appid, name, genre, tags
  - ['Tags'] is a nested dictionary; each game has **20** tags
  - Some games have more than one genre assigned

# Descriptive Statistic

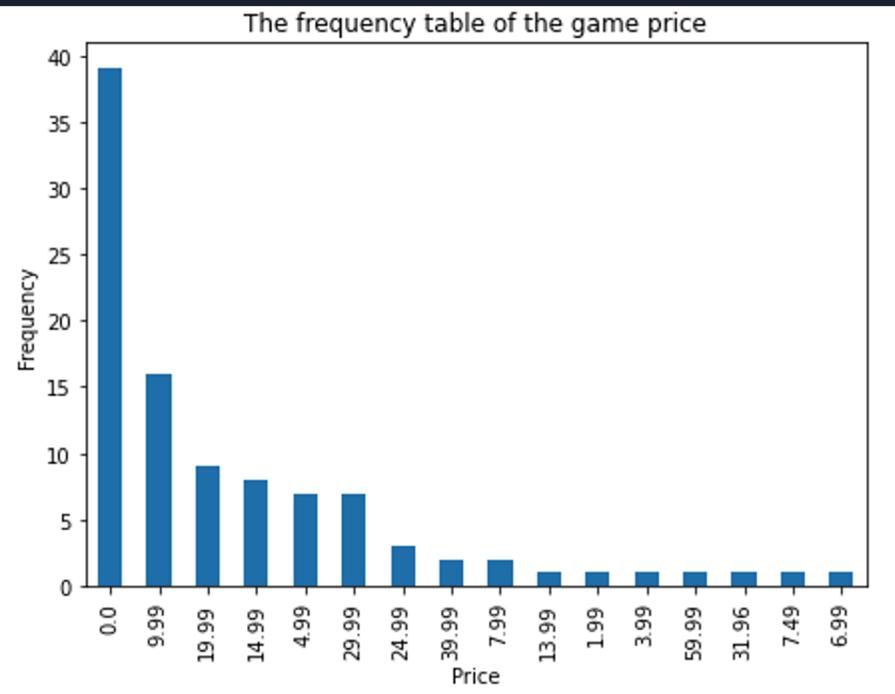
	avg_forever	avg_2wk	median_forever	median_2wk	price	initial_price	discount	ccu
count	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000
mean	4021.950000	381.640000	903.240000	317.370000	1001.860000	1064.360000	1.550000	35461.610000
std	6007.659379	546.889543	1642.926258	582.191049	1170.515427	1251.873969	10.910448	109763.058339
min	14.000000	0.000000	5.000000	0.000000	0.000000	0.000000	0.000000	0.000000
25%	734.750000	16.750000	163.500000	16.750000	0.000000	0.000000	0.000000	647.000000
50%	1512.000000	176.500000	343.500000	173.000000	774.000000	799.000000	0.000000	4030.500000
75%	5074.250000	490.250000	872.000000	409.000000	1499.000000	1624.000000	0.000000	21719.250000
max	32301.000000	3062.000000	12141.000000	5057.000000	5999.000000	5999.000000	80.000000	870470.000000

# Data - Game Activity



- Top 2 games with the most dynamic change in trend:
  - Among us
  - Terraria
- Among us is increased from a single number to the peak at 447,476 on Sep 26, 2020.
- Terraria: Peaked at 489,886 on May 16, 2020, and then dropped down.
- Why does Among Us work during pandemic times?

# Data- Game Price



- In the top 100 games, 39 games are free
- one of the games -Street Warrior Online(ID: 417910) is paid game
- there are no concurrent users; thus, the revenue is \$0.