

IDENTIFYING POPULAR GAME BUNDLES FOR MARKETING CAMPAIGNS

**FRANCISCO | JAVIER | QUINTO
BSIT 2-4**

INTRODUCTION



PEOPLE FIND JOY IN DIFFERENT THINGS IN LIFE LIKE GOING OUT FOR A WALK, LISTENING TO SOME MUSIC, COOKING FOOD, PETTING THEIR CATS AND DOGS, OR BY PLAYING GAMES. EVER SINCE THE START OF HUMANITY'S CIVILIZATION, WE'VE COME A VERY LONG WAY FROM WHAT WE FOUND ENTERTAINING AND WHAT THINGS DO WE CONSIDER AS "GAMES" IN THE PRESENT GENERATION. IN THE MODERN WORLD, VIDEO GAMES HAVE BEEN RAMPANT AND CONTINUOUSLY GROWING IN DIFFERENT ASPECTS FOR GENERATIONS.

MANY PEOPLE PLAY MANY GAMES AT THE SAME TIME. GAMING COMPANIES, BRANDS, OR EVEN DIGITAL DISTRIBUTION PLATFORMS LIKE GOOGLE PLAY STORE CREATE GAME PASSES WHERE AN INDIVIDUAL PLAYER CAN SUBSCRIBE TO GAIN ACCESS TO A ROSTER OF PREMIUM GAMES FOR A MONTHLY COST. THIS IS A HUGE MARKET FOR PLAYERS WHO PLAY GAMES REGULARLY ESPECIALLY IF THEIR LOVED GAMES ARE INCLUDED IN THE GAME PASS. DUE TO THE ADVANCEMENTS IN TECHNOLOGY, MOST GAME PASSES ARE NOW FREE FROM DEVICE RESTRICTIONS AND CAN BE ACCESSED BY THE PLAYERS IN MORE THAN ONE TYPE OF DEVICE. HOWEVER, GAMES ARE BEING RELEASED AT DIFFERENT TIMES OF THE YEAR AND TRENDS MOVE UNEXPECTEDLY EACH MONTH. THIS IS WHY THE ROSTER OF GAMES INCLUDED IN THE GAME PASS SHOULD BE UPDATED REGULARLY.

PROBLEM DEFINITION



NEW GAMES ARE BEING RELEASED LEFT AND RIGHT AND THE TRENDS HAVE BEEN SHIFTING. SOME OLDER GAMES WERE EXPECTED TO FALL IF THEY'RE NOT ABLE TO SUSTAIN THEIR POPULARITY FOR LONGER. COMPANY A WERE EXPECTING THIS TO HAPPEN FROM A PREDICTION USING THEIR GATHERED DATA AND WANTS TO UPDATE THEIR CURRENT GAME PASS BEFORE THE CURRENT SEASON ENDS.

COMPANY A WANTS TO KNOW WHICH GAMES ARE CURRENTLY IN THE TREND AMONG PLAYERS AND UPDATE THEIR CURRENT GAME PASS EXCLUSIVE GAMES LIST TO A NEW ONE THAT MATCHES THE SHIFTING TRENDS. THIS PAPER AIMS TO KNOW WHICH LATEST GAMES ARE MOST PREFERRED TO BE PLAYED AMONG PEOPLE AND THE CURRENT POPULAR GAME PREFERENCES OF DIFFERENT PLAYERS.

OBJECTIVES





**IDENTIFY THE BEST GAME COMBINATIONS
TO GO IN BUNDLES BASED ON PLAYER
PREFERENCES AND CURRENT TRENDS.**

**DETERMINE THE FREQUENCY AND
STRENGTH BETWEEN GAME COMBINATIONS
THAT ARE MOST APPEALING TO PLAYERS.**



**PREDICT FUTURE TRENDS IN GAME
POPULARITY AND PLAYER PREFERENCES.**

MANUAL COMPUTATION



HISTORICAL DATA

Which of these games are you playing currently or interested in playing?
Call of Duty; Stardew Valley; Roblox; Minecraft; Genshin Impact; Honkai Star Rail; Wuthering Waves; League of Legends; Valorant
Mobile Legends; Roblox
Call of Duty; Roblox; Minecraft; Valorant
Minecraft; Genshin Impact; Left 4 Dead 2
Mobile Legends; Stardew Valley; Clash of Clans; Roblox; Genshin Impact; Overwatch; Grand Theft Auto V
Wild Rift; Roblox; Minecraft; League of Legends; Teamfight Tactics (TFT)
Mobile Legends; Roblox
Roblox; Genshin Impact
Mobile Legends; Wild Rift; Call of Duty; Clash of Clans; Minecraft; Valorant; Farlight; Grand Theft Auto V; NBA 2K24
Mobile Legends; Wild Rift; Call of Duty; PUBG: Battlegrounds; Clash of Clans; Roblox; Minecraft; Genshin Impact; Valorant; Farlight; Left 4 Dead 2; Fortnite; Apex Legends; Grand Theft Auto V
Mobile Legends; Roblox; Valorant; Farlight
Mobile Legends; Wild Rift; Honkai Star Rail; Honor of Kings
Mobile Legends; Stardew Valley; Roblox; Minecraft; Genshin Impact; Wuthering Waves; Grand Theft Auto V
Mobile Legends; Wild Rift; League of Legends
Roblox
Minecraft; Genshin Impact; Honkai Star Rail; Tears of Themis, Mystic Messenger
PUBG: Battlegrounds; Stardew Valley; Roblox; Valorant; Overwatch; Grand Theft Auto V; Assassin's creed
Mobile Legends; Call of Duty; Stardew Valley; Roblox; Minecraft; Counter-Strike 2

Mobile Legends; Wild Rift; Terraria; Genshin Impact; Honkai Star Rail; Wuthering Waves; League of Legends
Mobile Legends; Wild Rift; Roblox; Minecraft; League of Legends; Valorant; Honor of Kings
Mobile Legends; Roblox; Minecraft; Genshin Impact; Honkai Star Rail; Wuthering Waves; Valorant; Counter-Strike 2; Farlight; Left 4 Dead 2; Grand Theft Auto V
Mobile Legends; Minecraft; Genshin Impact; Honkai Star Rail; Wuthering Waves
Mobile Legends; PUBG: Battlegrounds; Stardew Valley; Clash of Clans; Minecraft; League of Legends
Mobile Legends; Call of Duty; Minecraft; Genshin Impact; Honkai Star Rail; Wuthering Waves; League of Legends; Valorant; Farlight
Wild Rift; PUBG: Battlegrounds; Roblox; Minecraft; Valorant; Arena Breakout
Stardew Valley
Stardew Valley; Genshin Impact; League of Legends
Mobile Legends; Wild Rift; Call of Duty; PUBG: Battlegrounds; Stardew Valley; Clash of Clans; Terraria; Roblox; Minecraft; Genshin Impact; Honkai Star Rail; Wuthering Waves; League of Legends; Teamfight Tactics (TFT); Legends of Runeterra (LoR); Valorant; Counter-Strike 2; Farlight; Left 4 Dead 2; Fortnite; Overwatch; Apex Legends
Mobile Legends; Call of Duty; Honkai Star Rail; Fortnite; NBA 2K24
Wild Rift; Roblox; Minecraft; League of Legends; Teamfight Tactics (TFT); Valorant
Call of Duty; Roblox
Mobile Legends; Wild Rift; Call of Duty; PUBG: Battlegrounds; Stardew Valley; Clash of Clans; Terraria; Roblox; Minecraft; Genshin Impact; Honkai Star Rail; Wuthering Waves; DOTA 2; League of Legends; Teamfight Tactics (TFT); Legends of Runeterra (LoR); Valorant; Counter-Strike 2; Farlight; Left 4 Dead 2; Fortnite; Overwatch; Apex Legends; Grand Theft Auto V; NBA 2K24

HISTORICAL DATA

Mobile Legends;Call of Duty;Clash of Clans;Minecraft;Farlight;Left 4 Dead 2;Grand Theft Auto V

Stardew Valley;Terraria;Genshin Impact;Honkai Star Rail;Wuthering Waves

PUBG: Battlegrounds;Minecraft;Genshin Impact;Honkai Star Rail;Wuthering Waves;DOTA 2;League of Legends;Valorant

Mobile Legends;Call of Duty;Genshin Impact;Wuthering Waves

Mobile Legends;Wild Rift;League of Legends;Valorant

Mobile Legends;Wild Rift;Call of Duty;Clash of Clans;Roblox;DOTA 2;League of Legends;Teamfight Tactics (TFT);Valorant;Farlight;Grand Theft Auto V;NBA 2K24

Valorant

Minecraft;Genshin Impact;Honkai Star Rail;Wuthering Waves

Mobile Legends;Wild Rift;Genshin Impact;Wuthering Waves;Cookie Run Kingdom

Mobile Legends;Call of Duty;PUBG: Battlegrounds;Roblox;Minecraft;Genshin

HISTORICAL DATA

Impact;Honkai Star Rail;Wuthering Waves;Apex Legends
Minecraft;Valorant;Counter-Strike 2;Overwatch;Apex Legends
Stardew Valley;Clash of Clans;Minecraft;Genshin Impact;Teamfight Tactics (TFT);Farlight;Grand Theft Auto V
Mobile Legends;Stardew Valley;Genshin Impact;Honkai Star Rail;Wuthering Waves
Minecraft;League of Legends;Teamfight Tactics (TFT);Valorant;Counter-Strike 2
Mobile Legends;League of Legends;Teamfight Tactics (TFT);Melty Blood: Type Lumina and Osu
Mobile Legends;Terraria;Roblox;Minecraft;League of Legends; Valorant ;Farlight;Left 4 Dead 2;Fortnite;Apex Legends;Grand Theft Auto V
Mobile Legends;Wild Rift;Call of Duty;PUBG: Battlegrounds;Clash of Clans;Terraria;Roblox;Valorant
Mobile Legends;Wild Rift;Minecraft;Genshin Impact;Honkai Star Rail;Wuthering Waves;Overwatch

C1

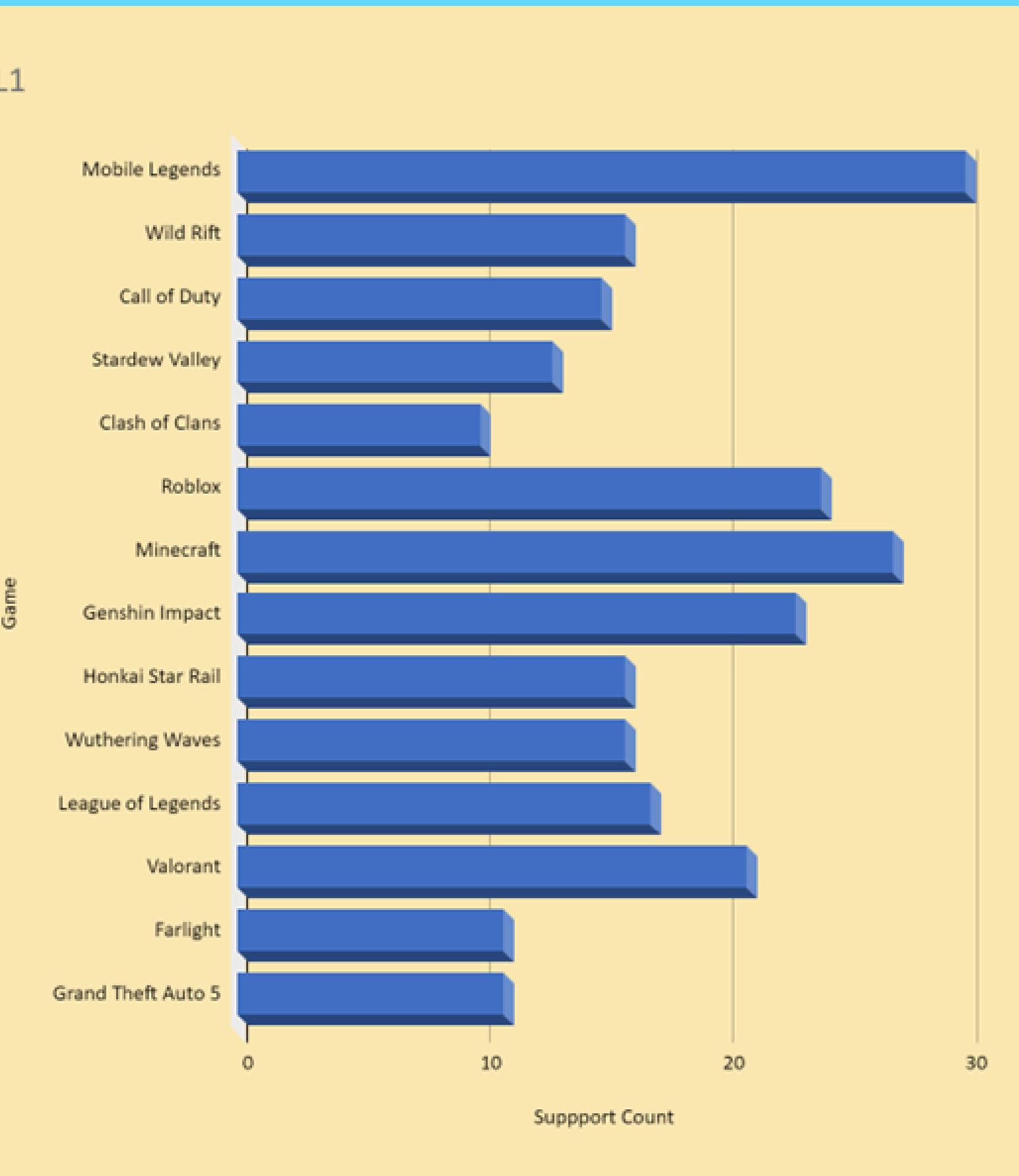
Game	<u>Support</u> Count	Support
Mobile Legends	30	0.6
Wild Rift	16	0.32
Call of Duty	15	0.3
PUBG	9	0.18
Stardew Valley	13	0.26
Clash of Clans	10	0.2
Terraria	6	0.12
Roblox	24	0.48
Minecraft	27	0.54
Genshin Impact	23	0.46
Honkai Star Rail	16	0.32
Wuthering Waves	16	0.32
DOTA 2	3	0.06
League of Legends	17	0.34
Teamfight Tactics	8	0.16
Legends of Runeterra	2	0.04
Valorant	21	0.42
Counter-Strike 2	6	0.12
Farlight	11	0.22
Left 4 dead 2	7	0.14

Fortnite	5	0.1
Overwatch	6	0.12
Apex Legends	6	0.12
Grand Theft Auto 5	11	0.22
NBA 2K24	4	0.08
Honor of Kings	2	0.04
Tears of Themis	1	0.02
Mystic Messenger	1	0.02
Assassin's Creed	1	0.02
Cookie Run Kingdon	1	0.02
Melty Blood: Type Lumina	1	0.02
Osu	1	0.02

L1

Game	Support Count	Support
Mobile Legends	30	0.6
Wild Rift	16	0.32
Call of Duty	15	0.3
Stardew Valley	13	0.26
Clash of Clans	10	0.2
Roblox	24	0.48
Minecraft	27	0.54
Genshin Impact	23	0.46
Honkai Star Rail	16	0.32
Wuthering Waves	16	0.32
League of Legends	17	0.34
Valorant	21	0.42
Farlight	11	0.22
Grand Theft Auto 5	11	0.22

L1



C2

Mobile Legends, Genshin Impact	14	0.28
Mobile Legends, Honkai Star Rail	11	0.22
Mobile Legends, Wuthering Waves	12	0.24
Mobile Legends, League of Legends	11	0.22
Mobile Legends, Valorant	12	0.24
Mobile Legends, Farlight	10	0.2
Mobile Legends, Grand Theft Auto V	9	0.18
Wild Rift, Call of Duty	6	0.12
Wild Rift, Stardew Valley	2	0.04
Wild Rift, Clash of Clans	6	0.12
Wild Rift, Roblox	9	0.18
Wild Rift, Minecraft	9	0.18
Wild Rift, Genshin Impact	6	0.12
Wild Rift, Honkai Star Rail	5	0.1
Wild Rift, Wuthering Waves	5	0.1
Wild Rift, League of Legends	9	0.18
Wild Rift, Valorant	10	0.2
Wild Rift, Farlight	5	0.1
Wild Rift, Grand Theft Auto V	4	0.08
Call of Duty, Stardew Valley	4	0.08
Call of Duty, Clash of Clans	7	0.14
Call of Duty, Roblox	10	0.2
Call of Duty, Minecraft	10	0.2
Call of Duty, Genshin Impact	7	0.14
Call of Duty, Honkai Star Rail	6	0.12
Call of Duty, Wuthering Waves	6	0.12

Games	Support count	Support
Mobile Legends, Wild Rift	13	0.26
Mobile Legends, Call of Duty	12	0.24
Mobile Legends, Stardew Valley	7	0.14
Mobile Legends, Clash of Clans	9	0.18
Mobile Legends, Roblox	15	0.3
Mobile Legends, Minecraft	15	0.3
Call of Duty, League of Legends	5	0.1
Call of Duty, Valorant	9	0.18
Call of Duty, Farlight	7	0.14
Call of Duty, Grand Theft Auto V	5	0.1
Stardew Valley, Clash of Clans	5	0.1
Stardew Valley, Roblox	7	0.14
Stardew Valley, Minecraft	7	0.14
Stardew Valley, Genshin Impact	9	0.18
Stardew Valley, Honkai Star Rail	5	0.1
Stardew Valley, Wuthering Waves	6	0.12
Stardew Valley, League of Legends	5	0.1
Stardew Valley, Valorant	4	0.08

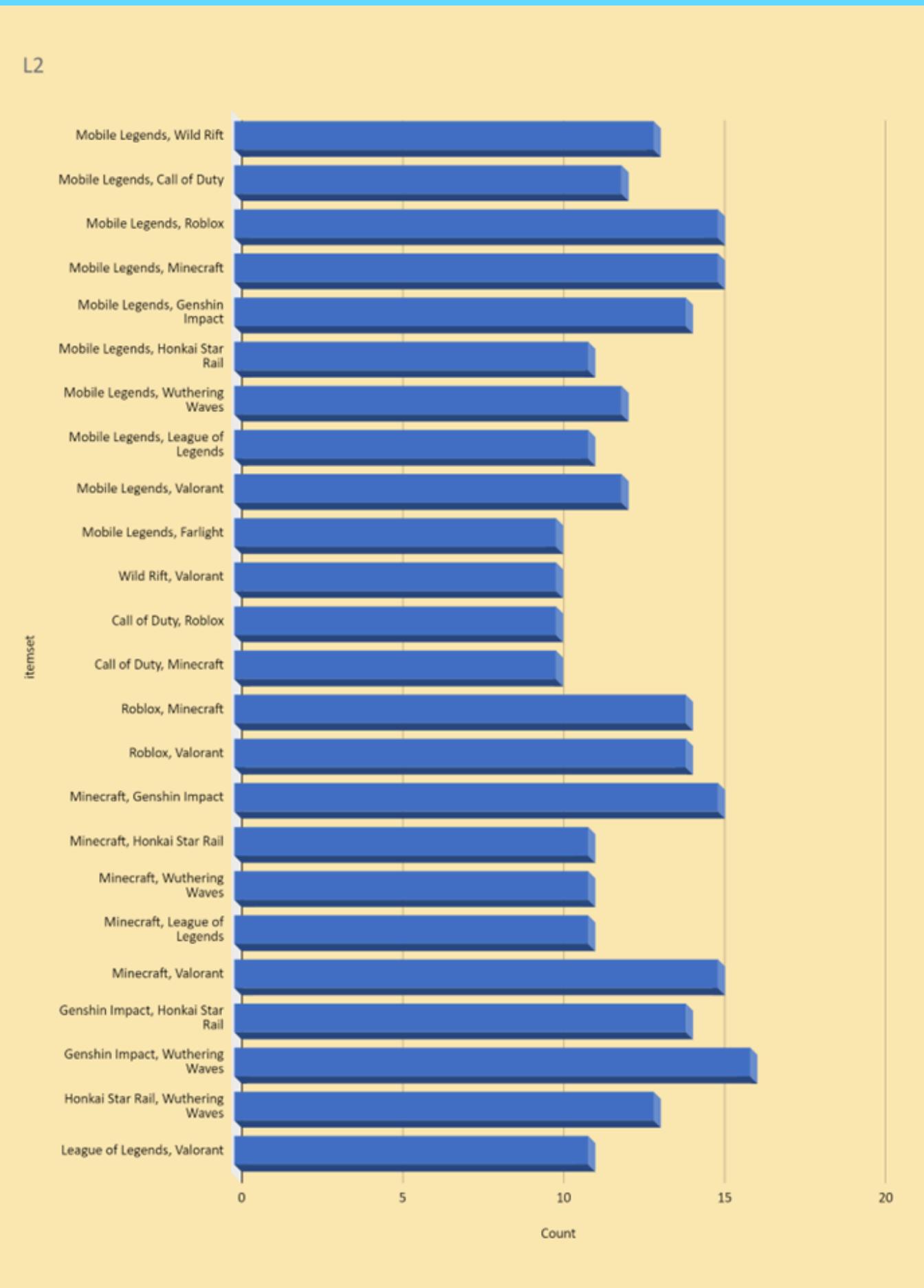
C2

Stardew Valley, Farlight	3	0.06	Genshin Impact, League of Legends	7	0.14
Stardew Valley, Grand Theft Auto V	5	0.1	Genshin Impact, Valorant	7	0.14
Clash of Clans, Roblox	6	0.12	Genshin Impact, Farlight	6	0.12
Clash of Clans, Minecraft	7	0.14	Genshin Impact, Grand Theft Auto V	6	0.12
Clash of Clans, Genshin Impact	5	0.1	Honkai Star Rail, Wuthering Waves	13	0.26
Clash of Clans, Honkai Star Rail	2	0.04	Honkai Star Rail, League of Legends	6	0.12
Clash of Clans, Wuthering Waves	2	0.04	Honkai Star Rail, Valorant	6	0.12
Clash of Clans, League of Legends	4	0.08	Honkai Star Rail, Farlight	4	0.08
Clash of Clans, Valorant	6	0.12	Honkai Star Rail, Grand Theft Auto V	2	0.04
Clash of Clans, Farlight	7	0.14	Wuthering Waves, League of Legends	6	0.12
Clash of Clans, Grand Theft Auto V	7	0.14	Genshin Impact, League of Legends	7	0.14
Roblox, Minecraft	14	0.28	Genshin Impact, Valorant	7	0.14
Roblox, Genshin Impact	9	0.18	Genshin Impact, Farlight	6	0.12
Roblox, Honkai Star Rail	5	0.1	Genshin Impact, Grand Theft Auto V	6	0.12
Roblox, Wuthering Waves	6	0.12	Honkai Star Rail, Wuthering Waves	13	0.26
Roblox, League of Legends	8	0.16	Honkai Star Rail, League of Legends	6	0.12
Roblox, Valorant	14	0.28	Honkai Star Rail, Valorant	6	0.12
Roblox, Farlight	7	0.14	Honkai Star Rail, Farlight	4	0.08
Roblox, Grand Theft Auto V	8	0.16	Honkai Star Rail, Grand Theft Auto V	2	0.04
Minecraft, Genshin Impact	15	0.3	Wuthering Waves, League of Legends	6	0.12
Minecraft, Honkai Star Rail	11	0.22	Genshin Impact, League of Legends	7	0.14
Minecraft, Wuthering Waves	11	0.22	Genshin Impact, Valorant	7	0.14
Minecraft, League of Legends	11	0.22	Genshin Impact, Farlight	6	0.12
Minecraft, Valorant	15	0.3	Genshin Impact, Grand Theft Auto V	6	0.12
Minecraft, Farlight	9	0.18	Honkai Star Rail, Wuthering Waves	13	0.26
Minecraft, Grand Theft Auto V	8	0.16	Honkai Star Rail, League of Legends	6	0.12
Genshin Impact, Honkai Star Rail	14	0.28	Honkai Star Rail, Valorant	6	0.12
Genshin Impact, Wuthering Waves	16	0.32	Honkai Star Rail, Farlight	4	0.08
			Honkai Star Rail, Grand Theft Auto V	2	0.04
			Wuthering Waves, League of Legends	6	0.12

L2

itemset	Count	Support
Mobile Legends, Wild Rift	13	0.26
Mobile Legends, Call of Duty	12	0.24
Mobile Legends, Roblox	15	0.3
Mobile Legends, Minecraft	15	0.3
Mobile Legends, Genshin Impact	14	0.28
Mobile Legends, Honkai Star Rail	11	0.22
Mobile Legends, Wuthering Waves	12	0.24
Mobile Legends, League of Legends	11	0.22
Mobile Legends, Valorant	12	0.24
Mobile Legends, Farlight	10	0.2
Wild Rift, Valorant	10	0.2
Call of Duty, Roblox	10	0.2
Call of Duty, Minecraft	10	0.2
Roblox, Minecraft	14	0.28
Roblox, Valorant	14	0.28
Minecraft, Genshin Impact	15	0.3
Minecraft, Honkai Star Rail	11	0.22
Minecraft, Wuthering Waves	11	0.22
Minecraft, League of Legends	11	0.22
Minecraft, Valorant	15	0.3
Genshin Impact, Honkai Star Rail	14	0.28
Genshin Impact, Wuthering Waves	16	0.32
Honkai Star Rail, Wuthering Waves	13	0.26
League of Legends, Valorant	11	0.22

L2



C3

dataset			support count	support	Mobile Legends	Roblox	Farlight	7	0.14
Mobile Legends	Wild Rift	Call of Duty	6	0.12	Mobile Legends	Minecraft	Genshin Impact	9	0.18
Mobile Legends	Wild Rift	Roblox	6	0.12	Mobile Legends	Minecraft	Honkai Star Rail	7	0.14
Mobile Legends	Wild Rift	Minecraft	6	0.12	Mobile Legends	Minecraft	Wuthering Waves	8	0.16
Mobile Legends	Wild Rift	Genshin Impact	6	0.12	Mobile Legends	Minecraft	League of Legends	6	0.12
Mobile Legends	Wild Rift	Honkai Star Rail	5	0.1					
Mobile Legends	Wild Rift	Wuthering Waves	5	0.1					
Mobile Legends	Wild Rift	League of Legends	7	0.14					
Mobile Legends	Wild Rift	Valorant	8	0.16					
Mobile Legends	Wild Rift	Farlight	5	0.1					
Mobile Legends	Call of Duty	Roblox	7	0.14					
Mobile Legends	Call of Duty	Minecraft	8	0.16					
Mobile Legends	Call of Duty	Genshin Impact	6	0.12					
Mobile Legends	Call of Duty	Honkai Star Rail	5	0.1					
Mobile Legends	Call of Duty	Wuthering Waves	5	0.1					
Mobile Legends	Call of Duty	League of Legends	4	0.08					
Mobile Legends	Call of Duty	Valorant	7	0.14					
Mobile Legends	Call of Duty	Farlight	7	0.14					
Mobile Legends	Roblox	Minecraft	9	0.18					
Mobile Legends	Roblox	Genshin Impact	7	0.14					
Mobile Legends	Roblox	Honkai Star Rail	4	0.08					
Mobile Legends	Roblox	Wuthering Waves	5	0.1					
Mobile Legends	Roblox	League of Legends	5	0.1					
Mobile Legends	Roblox	Valorant	9	0.18					

C3

Mobile Legends	Minecraft	Valorant	8	0.16
Mobile Legends	Minecraft	Farlight	8	0.16
Mobile Legends	Genshin Impact	Honkai Star Rail	9	0.18
Mobile Legends	Genshin Impact	Wuthering Waves	12	0.24
Mobile Legends	Genshin Impact	League of Legends	4	0.08
Mobile Legends	Genshin Impact	Valorant	5	0.1
Mobile Legends	Genshin Impact	Farlight	5	0.1
Mobile Legends	Honkai Star Rail	Wuthering Waves	9	0.18
Mobile Legends	Honkai Star Rail	League of Legends	4	0.08
Mobile Legends	Honkai Star Rail	Valorant	4	0.08
Mobile Legends	Honkai Star Rail	Farlight	4	0.08
Mobile Legends	Wuthering Waves	League of Legends	4	0.08
Mobile Legends	Wuthering Waves	Valorant	4	0.08
Mobile Legends	Wuthering Waves	Farlight	4	0.08
Mobile Legends	League of Legends	Valorant	7	0.14
Mobile Legends	League of Legends	Farlight	5	0.1
Mobile Legends	Valorant	Farlight	9	0.18
Wild Rift	Call of Duty	Roblox	5	0.1
Wild Rift	Call of Duty	Minecraft	4	0.08
Wild Rift	Call of Duty	Genshin Impact	3	0.06
Wild Rift	Call of Duty	Honkai Star Rail	2	0.04

Wild Rift	Call of Duty	Wuthering Waves	2	0.04
Wild Rift	Call of Duty	League of Legends	3	0.06
Wild Rift	Call of Duty	Valorant	6	0.12
Wild Rift	Call of Duty	Farlight	5	0.1
Wild Rift	Roblox	Minecraft	7	0.14
Wild Rift	Roblox	Genshin Impact	3	0.06
Wild Rift	Roblox	Honkai Star Rail	2	0.04

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Wild Rift	Roblox	Wuthering Waves	2	0.04	Wild Rift	League of Legends	Farlight	3	0.06
Wild Rift	Roblox	League of Legends	6	0.12	Wild Rift	Valorant	Farlight	5	0.1
Wild Rift	Roblox	Valorant	8	0.16	Call of Duty	Roblox	Minecraft	7	0.14
Wild Rift	Roblox	Farlight	4	0.08	Call of Duty	Roblox	Genshin Impact	5	0.1
Wild Rift	Minecraft	Genshin Impact	4	0.08	Call of Duty	Roblox	Honkai Star Rail	4	0.08
Wild Rift	Minecraft	Honkai Star Rail	3	0.06	Call of Duty	Roblox	Wuthering Waves	4	0.08
Wild Rift	Minecraft	Wuthering Waves	3	0.06	Call of Duty	Roblox	League of Legends	4	0.08
Wild Rift	Minecraft	League of Legends	5	0.1	Call of Duty	Roblox	Valorant	7	0.14
Wild Rift	Minecraft	Valorant	7	0.14	Call of Duty	Roblox	Farlight	4	0.08
Wild Rift	Minecraft	Farlight	4	0.08	Call of Duty	Minecraft	Genshin Impact	6	0.12
Wild Rift	Genshin Impact	Honkai Star Rail	4	0.08	Call of Duty	Minecraft	Honkai Star Rail	5	0.1
Wild Rift	Genshin Impact	Wuthering Waves	5	0.1	Call of Duty	Minecraft	Wuthering Waves	5	0.1
Wild Rift	Genshin Impact	League of Legends	3	0.06	Call of Duty	Minecraft	League of Legends	4	0.08
Wild Rift	Genshin Impact	Valorant	3	0.06	Call of Duty	Minecraft	Valorant	7	0.14
Wild Rift	Genshin Impact	Farlight	3	0.06	Call of Duty	Minecraft	Farlight	4	0.08
Wild Rift	Honkai Star Rail	Wuthering Waves	4	0.08	Call of Duty	Minecraft	Genshin Impact	6	0.12
Wild Rift	Honkai Star Rail	League of Legends	3	0.06	Call of Duty	Minecraft	Honkai Star Rail	5	0.1
Wild Rift	Honkai Star Rail	Valorant	2	0.04	Call of Duty	Minecraft	Wuthering Waves	5	0.1
Wild Rift	Honkai Star Rail	Farlight	2	0.04	Call of Duty	Minecraft	League of Legends	4	0.08
Wild Rift	Wuthering Waves	League of Legends	3	0.06	Call of Duty	Minecraft	Valorant	7	0.14
Wild Rift	Wuthering Waves	Valorant	2	0.04	Call of Duty	Minecraft	Farlight	6	0.12
Wild Rift	Wuthering Waves	Farlight	2	0.04					
	League of Legends	Valorant	6	0.12					

C3

Call of Duty	Minecraft	Honkai Star Rail	5	0.1	Roblox	Minecraft	League of Legends	7	0.14
Call of Duty	Minecraft	Wuthering Waves	5	0.1	Roblox	Minecraft	Valorant	10	0.2
Call of Duty	Minecraft	League of Legends	4	0.08	Roblox	Minecraft	Farlight	5	0.1
Call of Duty	Minecraft	Valorant	7	0.14	Roblox	Genshin Impact	Honkai Star Rail	5	0.1
Call of Duty	Minecraft	Farlight	6	0.12	Roblox	Genshin Impact	Wuthering Waves	6	0.12
Call of Duty	Genshin Impact	Honkai Star Rail	5	0.1	Roblox	Genshin Impact	League of Legends	3	0.06
Call of Duty	Genshin Impact	Wuthering Waves	6	0.12	Roblox	Genshin Impact	Valorant	5	0.1
Call of Duty	Genshin Impact	League of Legends	4	0.08	Roblox	Genshin Impact	Farlight	4	0.08
Call of Duty	Genshin Impact	Valorant	5	0.1	Roblox	Honkai Star Rail	Wuthering Waves	5	0.1
Call of Duty	Genshin Impact	Farlight	4	0.08	Roblox	Honkai Star Rail	League of Legends	3	0.06
Call of Duty	Honkai Star Rail	Wuthering Waves	5	0.1	Roblox	Honkai Star Rail	Valorant	4	0.08
Call of Duty	Honkai Star Rail	League of Legends	4	0.08	Roblox	Honkai Star Rail	Farlight	3	0.06
Call of Duty	Honkai Star Rail	Valorant	4	0.08	Roblox	Wuthering Waves	League of Legends	3	0.06
Call of Duty	Honkai Star Rail	Farlight	3	0.06	Roblox	Wuthering Waves	Valorant	4	0.08
Call of Duty	Wuthering Waves	League of Legends	4	0.08	Roblox	Wuthering Waves	Farlight	3	0.06
Call of Duty	Wuthering Waves	Valorant	4	0.08	Roblox	League of	Valorant	7	0.14
Call of Duty	Wuthering Waves	Farlight	3	0.06	Roblox	Legends	Farlight	4	0.08
	League of				Roblox	Valorant	Farlight	7	0.14
Call of Duty	Legends	Valorant	5	0.1	Minecraft	Genshin Impact	Honkai Star Rail	11	0.22
Call of Duty	League of	Farlight	4	0.08	Minecraft	Genshin Impact	Wuthering Waves	11	0.22
Call of Duty	Legends	Farlight	6	0.12	Minecraft	Genshin Impact	League of Legends	5	0.1
Roblox	Minecraft	Genshin Impact	7	0.14					
Roblox	Minecraft	Honkai Star Rail	5	0.1					
Roblox	Minecraft	Wuthering Waves	6	0.12					

C3

Minecraft	Genshin Impact	Valorant	7	0.14	Genshin Impact	Honkai Star Rail	Valorant	6	0.12
Minecraft	Genshin Impact	Farlight	6	0.12	Genshin Impact	Honkai Star Rail	Farlight	4	0.08
Minecraft	Honkai Star Rail	Wuthering Waves	10	0.2	Genshin Impact	Wuthering Waves	League of Legends	6	0.12
Minecraft	Honkai Star Rail	League of Legends	5	0.1	Genshin Impact	Wuthering Waves	Valorant	6	0.12
Minecraft	Honkai Star Rail	Valorant	6	0.12	Genshin Impact	Wuthering Waves	Farlight	4	0.08
Minecraft	Honkai Star Rail	Farlight	4	0.08		League of Legends	Valorant	5	0.1
Minecraft	Wuthering Waves	League of Legends	5	0.1	Genshin Impact	League of Legends	Farlight	3	0.06
Minecraft	Wuthering Waves	Valorant	6	0.12	Genshin Impact	Valorant	Farlight	5	0.1
Minecraft	Wuthering Waves	Farlight	4	0.08	Honkai Star Rail	Wuthering Waves	League of Legends	6	0.12
Minecraft	League of Legends	Valorant	9	0.18	Honkai Star Rail	Wuthering Waves	Valorant	6	0.12
	League of Legends				Honkai Star Rail	Wuthering Waves	Farlight	4	0.08
Minecraft	League of Legends	Farlight	4	0.08	Honkai Star Rail	League of Legends	Valorant	5	0.1
Minecraft	Valorant	Farlight	7	0.14	Honkai Star Rail	League of Legends	Farlight	3	0.06
Genshin Impact	Honkai Star Rail	Wuthering Waves	13	0.26	Honkai Star Rail	Valorant	Farlight	4	0.08
Genshin Impact	Honkai Star Rail	League of Legends	6	0.12	Wuthering Waves	League of Legends	Valorant	5	0.1

C3

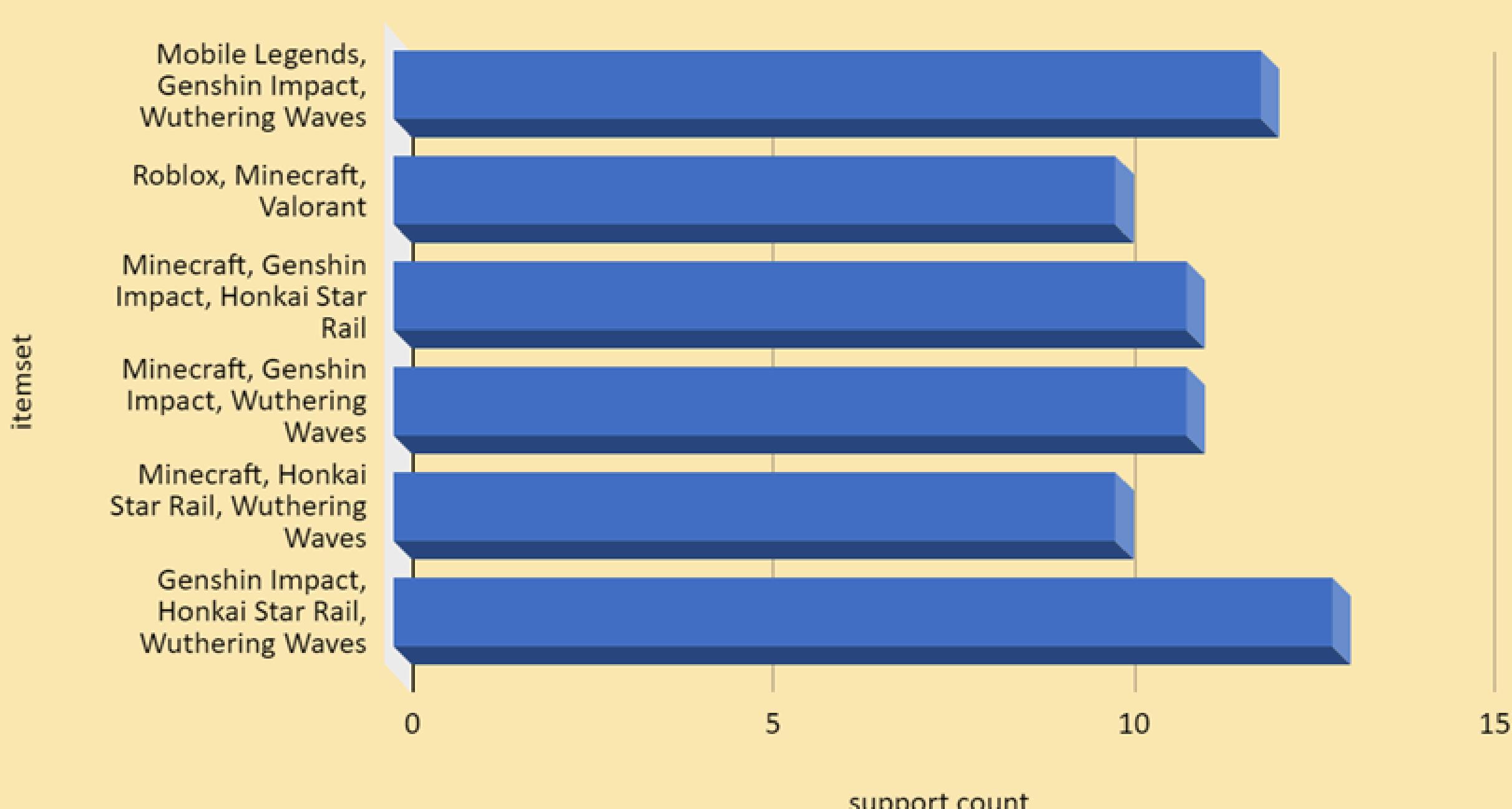
Wuthering Waves	League of Legends	Farlight	3	0.06
Wuthering Waves	Valorant	Farlight	4	0.08
League of Legends	Valorant	Farlight	5	0.1

L3

RULE			support count	support
Mobile Legends	Genshin Impact	Wuthering Waves	12	0.24
Roblox	Minecraft	Valorant	10	0.2
Minecraft	Genshin Impact	Honkai Star Rail	11	0.22
Minecraft	Genshin Impact	Wuthering Waves	11	0.22
Minecraft	Honkai Star Rail	Wuthering Waves	10	0.2
Genshin Impact	Honkai Star Rail	Wuthering Waves	13	0.26

L3

L3



L3 MANUAL COMPUTATION

Game 1	Game 2	Game 3	Support Count/ Freq	Support	
Mobile Legends	Genshin Impact	Wuthering Waves	12	0.24	
LHS		RHS	Confidence	Lift	Conviction
Mobile Legends	Genshin Impact	Wuthering Waves	0.85714285	2.678571	4.76
	Impact	Waves	71	429	
Mobile Legends	Wuthering Waves	Genshin Impact	1	043	INF
Wuthering Waves	Genshin Impact	Mobile Legends	0.75	1.25	1.6
LHS	RHS				
Mobile Legends	Genshin Impact	Wuthering Waves	0.4	1.25	33
Genshin Impact	Wuthering Waves	Mobile Legends	0.52173913	2.173913	1.5890909
Wuthering Waves	Genshin Impact	Mobile Legends	0.75	429	2.88

L3 MANUAL COMPUTATION

			Support Count/ Freq	Support	
Roblox	Minecraft	Valorant	10	0.2	
LHS		RHS	Confidence	Lift	Conviction
Roblox	Minecraft	Valorant	0.71428571	1.700680	
			43	272	2.03
Roblox	Valorant	Minecraft	0.71428571	1.322751	
			43	323	1.61
Valorant	Minecraft	Roblox	0.66666666	1.388888	
			67	889	1.56
LHS	RHS				
Roblox	Minecraft	Valorant	0.41666666	1.388888	
			67	889	1.2
Minecraft	Roblox	Valorant	0.37037037	1.322751	1.1435294
			04	323	12
Valorant	Roblox	Minecraft	0.47619047	1.700680	1.3745454
			62	272	55
			Support Count/ Freq	Support	
Minecraft	Genshin Impact	Honkai Star Rail	11	0.22	
LHS		RHS	Confidence	Lift	Conviction
Minecraft	Genshin Impact	Honkai Star Rail	0.73333333	2.291666	
Minecraft	Honkai Star Rail	Genshin Impact	33	667	2.55
Honkai Star Rail	Genshin	Minecraft	0.78571428	1.455026	2.1466666

	Impact		57	455	67
LHS	RHS				
Minecraft	Genshin Impact	Honkai Star Rail	0.40740740	1.455026	
			74	455	1.215
Genshin Impact	Minecraft	Honkai Star Rail	0.47826086	2.173913	
			96	043	1.495
Honkai Star Rail	Minecraft	Genshin Impact	2.291666		
			0.6875	667	2.24

L3 MANUAL COMPUTATION

			Support Count/ Freq	Support	
Minecraft	Genshin Impact	Wuthering Waves	11	0.22	
LHS		RHS	Confidence	Lift	Conviction
Minecraft	Genshin Impact	Wuthering Waves	0.73333333	2.291666	▼
Minecraft	Wuthering Waves	Genshin Impact	33	667	2.55
Wuthering Waves	Genshin Impact	Minecraft	0.6875	1.273148	1.472
LHS	RHS				
Minecraft	Genshin Impact	Wuthering Waves	0.40740740	1.273148	
Genshin Impact	Minecraft	Wuthering Waves	74	148	1.1475
Wuthering Waves	Minecraft	Genshin Impact	0.47826086	2.173913	
			96	043	1.495
			0.6875	2.291666	2.24

L3 MANUAL COMPUTATION

			Support Count/ Freq	Support	
Minecraft	Honkai Star Rail	Wuthering Waves	10	0.2	
LHS		RHS	Confidence	Lift	Conviction
Minecraft	Honkai Star Rail	Wuthering Waves	0.90909090 91	2.840909 091	7.48
Minecraft	Wuthering Waves	Honkai Star Rail	0.90909090 91	2.840909 091	7.48
Wuthering Waves	Honkai Star Rail	Minecraft	0.76923076 92	1.424501 425	1.9933333 33
LHS	RHS				
Minecraft	Honkai Star	Wuthering	0.37037037	1.424501	1.17529411
	Rail	Waves	04	425	8
Honkai Star Rail	Minecraft	Wuthering Waves	0.625	2.840909 091	2.08
Wuthering Waves	Minecraft	Honkai Star Rail	0.625	2.840909 091	2.08

L3 MANUAL COMPUTATION

			Support Count/ Freq	Support	
Genshin Impact	Honkai Star Rail	Wuthering Waves	13	0.26	
LHS		RHS	Confidence	Lift	Conviction
Genshin Impact	Honkai Star Rail	Wuthering Waves	0.92857142	2.901785	
Genshin Impact	Wuthering Waves	Honkai Star Rail	0.8125	2.539062	3.6266666
Wuthering Waves	Honkai Star Rail	Genshin Impact	1	2.173913	INF
LHS	RHS				
Genshin Impact	Honkai Star Rail	Wuthering Waves	0.56521739	2.173913	1.702
Honkai Star Rail	Genshin Impact	Wuthering Waves	0.8125	2.539062	3.6266666
Wuthering Waves	Genshin Impact	Honkai Star Rail	0.8125	2.901785	3.84

L3 VALID MODELS

L3 Valid Models							
L3			Support	Confidence	Lift	Conviction	Remarks
Genshin Impact	Honkai Star Rail	Wuthering Waves	0.26	0.93	2.90	9.52	Strong Association
Minecraft	Honkai Star Rail	Wuthering Waves	0.20	0.91	2.84	7.48	Strong Association
Minecraft	Wuthering Waves	Honkai Star Rail	0.20	0.91	2.84	7.48	Strong Association
Mobile Legends	Genshin Impact	Wuthering Waves	0.24	0.86	2.68	4.76	Strong Association
Wuthering Waves	Genshin Impact	Honkai Star Rail	0.26	0.81	2.90	3.84	Strong Association
Genshin Impact	Wuthering Waves	Honkai Star Rail	0.26	0.81	2.54	3.63	Strong Association
Honkai Star Rail	Genshin Impact	Wuthering Waves	0.26	0.81	2.54	3.63	Strong Association
Wuthering Waves	Genshin Impact	Mobile Legends	0.24	0.75	2.68	2.88	Strong Association
Minecraft	Genshin Impact	Honkai Star Rail	0.22	0.73	2.29	2.55	Strong Association
Minecraft	Genshin Impact	Wuthering Waves	0.22	0.73	2.29	2.55	Strong Association
Honkai Star Rail	Minecraft	Genshin Impact	0.22	0.69	2.29	2.24	Strong Association
Wuthering Waves	Minecraft	Genshin Impact	0.22	0.69	2.29	2.24	Strong Association
Honkai Star Rail	Genshin Impact	Minecraft	0.22	0.79	1.46	2.15	Strong Association

Honkai Star Rail	Minecraft	Wuthering Waves	0.20	0.63	2.84	2.08	Strong Association
Wuthering Waves	Minecraft	Honkai Star Rail	0.20	0.63	2.84	2.08	Strong Association
Roblox	Minecraft	Valorant	0.20	0.71	1.70	2.03	Strong Association
Wuthering Waves	Honkai Star Rail	Minecraft	0.20	0.77	1.42	1.99	Strong Association
Genshin Impact	Honkai Star Rail	Wuthering Waves	0.26	0.57	2.17	1.70	Strong Association
Roblox	Valorant	Minecraft	0.20	0.71	1.32	1.61	Strong Association
Wuthering Waves	Genshin Impact	Mobile Legends	0.24	0.75	1.25	1.60	Strong Association
Genshin Impact	Wuthering Waves	Mobile Legends	0.24	0.52	2.17	1.59	Strong Association
Valorant	Minecraft	Roblox	0.20	0.67	1.39	1.56	Strong Association
Wuthering Waves	Genshin Impact	Minecraft	0.22	0.69	1.27	1.47	Strong Association

PYTHON PROGRAM
COMPUTER
COMPUTATION OF
ASSOCIATION RULES



UNSORTED ASSOCIATION RULES

	antecedents	consequents	antecedent support	consequent support	support	confidence	lift	leverage	conviction	zhang_metric	
0	(Call of Duty)	(Minecraft)	0.38	0.54	0.066667	1.234568	0.0189	1.388889	0.271429		
1	(Call of Duty)	(Mobile Legends)	0.38	0.58	0.024	0.388889	1.333333	0.0588	2.088889	0.357143	
2	(Call of Duty)	(Roblox)	0.38	0.48	0.028	0.666667	1.188889	0.0508	1.568889	0.488889	
3	(Farlight)	(Mobile Legends)	0.22	0.68	0.028	0.388889	1.515152	0.0688	4.488889	0.435897	
4	(Honkai Star Rail)	(Genshin Impact)	0.32	0.46	0.028	0.375889	1.942174	0.1128	4.528889	0.697479	
5	(Genshin Impact)	(Honkai Star Rail)	0.46	0.32	0.028	0.688889	1.982174	0.1328	1.737778	0.878387	
6	(Minecraft)	(Genshin Impact)	0.54	0.46	0.028	0.555556	1.287729	0.0516	1.215889	0.375913	
7	(Genshin Impact)	(Minecraft)	0.46	0.54	0.019	0.652374	1.287729	0.0516	1.372589	0.318519	
8	(Genshin Impact)	(Mobile Legends)	0.46	0.68	0.028	0.488889	1.804493	0.0848	1.822122	0.808455	
9	(Wuthering Waves)	(Genshin Impact)	0.32	0.46	0.022	1.088889	1.173913	0.1728	inf	0.794118	
10	(Genshin Impact)	(Wuthering Waves)	0.46	0.32	0.022	0.695852	1.173913	0.1728	2.234286	1.008889	
11	(Honkai Star Rail)	(Minecraft)	0.32	0.54	0.022	0.687588	1.275148	0.0471	1.472888	0.315388	
12	(Honkai Star Rail)	(Mobile Legends)	0.32	0.68	0.022	0.687588	1.145833	0.0389	1.288889	0.187166	
13	(Honkai Star Rail)	(Wuthering Waves)	0.32	0.32	0.028	0.812588	2.539862	0.1576	3.628887	0.801483	
14	(Wuthering Waves)	(Honkai Star Rail)	0.32	0.12	0.026	0.812588	2.539862	0.1576	3.626667	0.891483	
15	(League of Legends)	(Minecraft)	0.34	0.54	0.022	0.647659	1.198257	0.0364	1.583333	0.258689	
16	(League of Legends)	(Mobile Legends)	0.38	0.68	0.022	0.647659	1.078431	0.0169	1.133333	0.118193	
17	(League of Legends)	(Valorant)	0.34	0.42	0.022	0.647659	1.548616	0.0772	1.643333	0.531688	
18	(Valorant)	(League of Legends)	0.42	0.34	0.022	0.523818	1.548616	0.0772	1.386889	0.685816	
19	(Mobile Legends)	(Minecraft)	0.68	0.54	0.038	0.588889	0.925926	-0.0248	0.928889	-0.166667	
20	(Minecraft)	(Mobile Legends)	0.54	0.68	0.038	0.555556	0.925926	-0.0248	0.568889	-0.148148	
21	(Minecraft)	(Roblox)	0.58	0.48	0.028	0.518518	1.088247	0.0388	1.688889	0.161491	
22	(Roblox)	(Minecraft)	0.48	0.54	0.028	0.583333	1.088247	0.0288	1.164889	0.142857	
23	(Minecraft)	(Valorant)	0.58	0.42	0.038	0.555556	1.322751	0.0731	1.305889	0.538435	
24	(Valorant)	(Minecraft)	0.42	0.54	0.038	0.714286	1.322751	0.0732	1.618889	0.428698	
25	(Wuthering Waves)	(Minecraft)	0.32	0.54	0.022	0.687588	1.275148	0.0471	1.472888	0.315388	
26	(Mobile Legends)	(Roblox)	0.68	0.48	0.038	0.588889	1.041667	0.0129	1.048889	0.188889	
27	(Roblox)	(Mobile Legends)	0.48	0.68	0.038	0.625889	1.041667	0.0128	1.666667	0.878923	
28	(Valorant)	(Mobile Legends)	0.42	0.68	0.028	0.571429	0.952181	-0.0128	0.913113	-0.079165	
29	(Wild Rift)	(Mobile Legends)	0.32	0.68	0.028	0.812588	1.354167	0.0688	2.133333	0.384615	
30	(Wuthering Waves)	(Mobile Legends)	0.32	0.68	0.024	0.758889	1.258889	0.0168	1.688889	0.294118	
31	(Roblox)	(Valorant)	0.48	0.42	0.028	0.583333	1.388889	0.0784	1.392889	0.538462	
32	(Valorant)	(Roblox)	0.42	0.48	0.028	0.666667	1.388889	0.0784	1.568889	0.482359	
33	(Wild Rift)	(Valorant)	0.32	0.42	0.028	0.625889	1.488895	0.0656	1.546667	0.482353	
34	(Minecraft, Honkai Star Rail)	(Genshin Impact)	0.22	0.46	0.022	1.088889	2.173913	0.1188	inf	0.692388	
35	(Honkai Star Rail, Genshin Impact)	(Minecraft)	0.28	0.54	0.022	0.785714	1.455826	0.0688	2.146667	0.414183	
36	(Minecraft, Genshin Impact)	(Honkai Star Rail)	0.38	0.32	0.022	0.733333	2.291667	0.1249	2.558889	0.895195	
37	(Honkai Star Rail)	(Minecraft, Genshin Impact)	0.32	0.38	0.022	0.687588	2.291667	0.1249	2.248889	0.828877	
38	(Honkai Star Rail, Wuthering Waves)	(Genshin Impact)	0.26	0.46	0.026	1.088889	2.173913	0.1484	inf	0.729738	
39	(Honkai Star Rail, Genshin Impact)	(Wuthering Waves)	0.28	0.32	0.028	0.928571	2.981788	0.1784	9.528889	0.918156	
40	(Wuthering Waves, Genshin Impact)	(Honkai Star Rail)	0.32	0.32	0.026	0.812588	2.539862	0.1576	3.626667	0.891483	
41	(Honkai Star Rail)	(Wuthering Waves, Genshin Impact)	0.32	0.32	0.026	0.812588	2.539862	0.1576	3.626667	0.891483	
42	(Wuthering Waves)	(Honkai Star Rail, Genshin Impact)	0.32	0.28	0.026	0.812588	2.981788	0.1784	3.848889	0.953881	
43	(Genshin Impact)	(Honkai Star Rail, Wuthering Waves)	0.46	0.26	0.026	0.565217	2.173913	0.1484	1.782889	1.008889	
44	(Minecraft, Wuthering Waves)	(Genshin Impact)	0.22	0.46	0.022	1.088889	2.173913	0.1188	inf	0.692388	
45	(Minecraft, Genshin Impact)	(Wuthering Waves)	0.38	0.32	0.022	0.733333	2.291667	0.1249	2.558889	0.895195	
46	(Wuthering Waves, Genshin Impact)	(Minecraft)	0.32	0.54	0.022	0.687588	1.275148	0.0472	1.472888	0.315388	
47	(Wuthering Waves)	(Minecraft, Genshin Impact)	0.12	0.38	0.022	0.687588	2.791667	0.1249	2.348889	0.828877	
48	(Mobile Legends, Wuthering Waves)	(Genshin Impact)	0.24	0.46	0.024	1.088889	2.173913	0.1296	inf	0.710526	
49	(Mobile Legends, Genshin Impact)	(Wuthering Waves)	0.28	0.32	0.024	0.857143	2.678571	0.1584	4.768889	0.878178	
50	(Wuthering Waves, Genshin Impact)	(Mobile Legends)	0.32	0.68	0.024	0.758889	1.258889	0.0489	1.688889	0.294118	
51	(Wuthering Waves)	(Mobile Legends, Genshin Impact)	0.32	0.28	0.024	0.758889	2.678571	0.1584	2.888889	0.921569	
52	(Genshin Impact)	(Mobile Legends, Wuthering Waves)	0.46	0.24	0.024	0.521739	2.173913	0.1296	1.588889	1.068889	
53	(Minecraft, Honkai Star Rail)	(Wuthering Waves)	0.22	0.32	0.028	0.909891	2.848993	0.1296	7.488889	0.838769	
54	(Honkai Star Rail, Wuthering Waves)	(Minecraft)	0.26	0.54	0.028	0.769331	1.424581	0.0796	1.993113	0.482783	
55	(Minecraft, Wuthering Waves)	(Honkai Star Rail)	0.22	0.32	0.028	0.909891	2.848993	0.1296	7.488889	0.838769	
56	(Honkai Star Rail)	(Minecraft, Wuthering Waves)	0.32	0.22	0.028	0.625889	2.848993	0.1296	2.888889	0.952941	
57	(Wuthering Waves)	(Minecraft, Honkai Star Rail)	0.32	0.22	0.028	0.625889	2.848993	0.1296	2.888889	0.952941	
58	(Minecraft, Roblox)	(Valorant)	0.28	0.42	0.028	0.714286	1.708889	0.0824	2.638889	0.572122	
59	(Minecraft, Valorant)	(Roblox)	0.38	0.48	0.028	0.					

SORTED ASSOCIATION RULES (BY CONVICTION, DESCENDING)

	antecedents	consequents	support	confidence	lift	conviction
34	(Minecraft, Honkai Star Rail)	(Genshin Impact)	0.22	1.000000	2.173913	inf
9	(Wuthering Waves)	(Genshin Impact)	0.32	1.000000	2.173913	inf
44	(Minecraft, Wuthering Waves)	(Genshin Impact)	0.22	1.000000	2.173913	inf
48	(Mobile Legends, Wuthering Waves)	(Genshin Impact)	0.24	1.000000	2.173913	inf
38	(Honkai Star Rail, Wuthering Waves)	(Genshin Impact)	0.26	1.000000	2.173913	inf
39	(Honkai Star Rail, Genshin Impact)	(Wuthering Waves)	0.26	0.928571	2.981786	9.520000
55	(Minecraft, Wuthering Waves)	(Honkai Star Rail)	0.26	0.909091	2.848989	7.480000
53	(Minecraft, Honkai Star Rail)	(Wuthering Waves)	0.26	0.909091	2.848989	7.480000
49	(Mobile Legends, Genshin Impact)	(Wuthering Waves)	0.24	0.857143	2.678571	4.760000
3	(Farlight)	(Mobile Legends)	0.26	0.909091	1.515152	4.400000
4	(Honkai Star Rail)	(Genshin Impact)	0.28	0.875000	1.982174	4.320000
42	(Wuthering Waves)	(Honkai Star Rail, Genshin Impact)	0.26	0.812500	2.981786	3.840000
40	(Wuthering Waves, Genshin Impact)	(Honkai Star Rail)	0.26	0.812500	2.539862	3.626667
41	(Honkai Star Rail)	(Wuthering Waves, Genshin Impact)	0.26	0.812500	2.539862	3.626667
13	(Honkai Star Rail)	(Wuthering Waves)	0.26	0.812500	2.539862	3.626667
14	(Wuthering Waves)	(Honkai Star Rail)	0.26	0.812500	2.539862	3.626667
51	(Wuthering Waves)	(Mobile Legends, Genshin Impact)	0.24	0.750000	2.678571	2.880000
36	(Minecraft, Genshin Impact)	(Honkai Star Rail)	0.22	0.733333	2.291667	2.550000
45	(Minecraft, Genshin Impact)	(Wuthering Waves)	0.22	0.733333	2.291667	2.550000
47	(Wuthering Waves)	(Minecraft, Genshin Impact)	0.22	0.687500	2.291667	2.240000
37	(Honkai Star Rail)	(Minecraft, Genshin Impact)	0.22	0.687500	2.291667	2.240000
38	(Genshin Impact)	(Wuthering Waves)	0.32	0.695652	2.173913	2.234286
35	(Honkai Star Rail, Genshin Impact)	(Minecraft)	0.22	0.785714	1.455826	2.146667
29	(Wild Rift)	(Mobile Legends)	0.26	0.812500	1.354167	2.133333
56	(Honkai Star Rail)	(Minecraft, Wuthering Waves)	0.26	0.625000	2.848989	2.080000
57	(Wuthering Waves)	(Minecraft, Honkai Star Rail)	0.26	0.625000	2.848989	2.080000
58	(Minecraft, Roblox)	(Valorant)	0.26	0.714286	1.780668	2.030000
1	(Call of Duty)	(Mobile Legends)	0.24	0.880000	1.333333	2.080000
54	(Honkai Star Rail, Wuthering Waves)	(Minecraft)	0.26	0.769231	1.424581	1.993333
5	(Genshin Impact)	(Honkai Star Rail)	0.26	0.688666	1.982174	1.737778
43	(Genshin Impact)	(Honkai Star Rail, Wuthering Waves)	0.26	0.565217	2.173913	1.782000
17	(League of Legends)	(Valorant)	0.22	0.647059	1.548616	1.643333
24	(Valorant)	(Minecraft)	0.30	0.714286	1.322751	1.610000
68	(Roblox, Valorant)	(Minecraft)	0.26	0.714286	1.322751	1.610000
59	(Wuthering Waves, Genshin Impact)	(Mobile Legends)	0.24	0.750000	1.250000	1.600000
38	(Wuthering Waves)	(Mobile Legends)	0.24	0.750000	1.250000	1.600000
52	(Genshin Impact)	(Mobile Legends, Wuthering Waves)	0.24	0.521739	2.173913	1.589891
59	(Minecraft, Valorant)	(Roblox)	0.26	0.666667	1.388889	1.560000
2	(Call of Duty)	(Roblox)	0.26	0.666667	1.388889	1.560000
32	(Valorant)	(Roblox)	0.28	0.666667	1.388889	1.560000
33	(Wild Rift)	(Valorant)	0.26	0.625000	1.488895	1.546667
46	(Wuthering Waves, Genshin Impact)	(Minecraft)	0.22	0.687500	1.273148	1.472000
11	(Honkai Star Rail)	(Minecraft)	0.22	0.687500	1.273148	1.472000
25	(Wuthering Waves)	(Minecraft)	0.22	0.687500	1.273148	1.472000
31	(Roblox)	(Valorant)	0.28	0.583333	1.388889	1.392000
18	(Valorant)	(League of Legends)	0.22	0.523810	1.548616	1.386000
8	(Call of Duty)	(Minecraft)	0.26	0.666667	1.234568	1.380000
7	(Genshin Impact)	(Minecraft)	0.30	0.652174	1.287729	1.322500
23	(Minecraft)	(Valorant)	0.30	0.555556	1.322751	1.385000
15	(League of Legends)	(Minecraft)	0.22	0.647059	1.198257	1.383333
12	(Honkai Star Rail)	(Mobile Legends)	0.22	0.687500	1.145833	1.280000
6	(Minecraft)	(Genshin Impact)	0.30	0.555556	1.287729	1.215000
16	(League of Legends)	(Mobile Legends)	0.22	0.647059	1.078431	1.133333
22	(Roblox)	(Mobile Legends)	0.28	0.583333	1.088247	1.184000
21	(Minecraft)	(Roblox)	0.28	0.518519	1.088247	1.080000
27	(Roblox)	(Mobile Legends)	0.30	0.625000	1.041667	1.066667
26	(Mobile Legends)	(Roblox)	0.30	0.580000	1.041667	1.040000
8	(Genshin Impact)	(Mobile Legends)	0.28	0.688666	1.014493	1.022222
28	(Valorant)	(Mobile Legends)	0.24	0.571429	0.952381	0.933333
19	(Mobile Legends)	(Minecraft)	0.30	0.580000	0.925926	0.920000
20	(Minecraft)	(Mobile Legends)	0.30	0.555556	0.925926	0.900000

PROGRAM

```
try:
    import pandas as pd
    from mlxtend.preprocessing import TransactionEncoder
    from mlxtend.frequent_patterns import *
except ImportError:
    print("error in importing libraries")
finally:
    dataset = pd.read_csv("./cleaned-dataset.csv")
    # drops first column before processing data
    dataset = dataset.drop("Email Address",axis=1)
    transactions = dataset.apply(lambda row: row.dropna().tolist(),axis=1).tolist()
    te = TransactionEncoder()
    item = te.fit(transactions).transform(transactions)
    df = pd.DataFrame(item,columns=te.columns_)
    freq = apriori(df,min_support=0.2,use_colnames=True,max_len=3)
    asso = association_rules(freq,metric='confidence',min_threshold=0.5)
    print(asso.to_string())

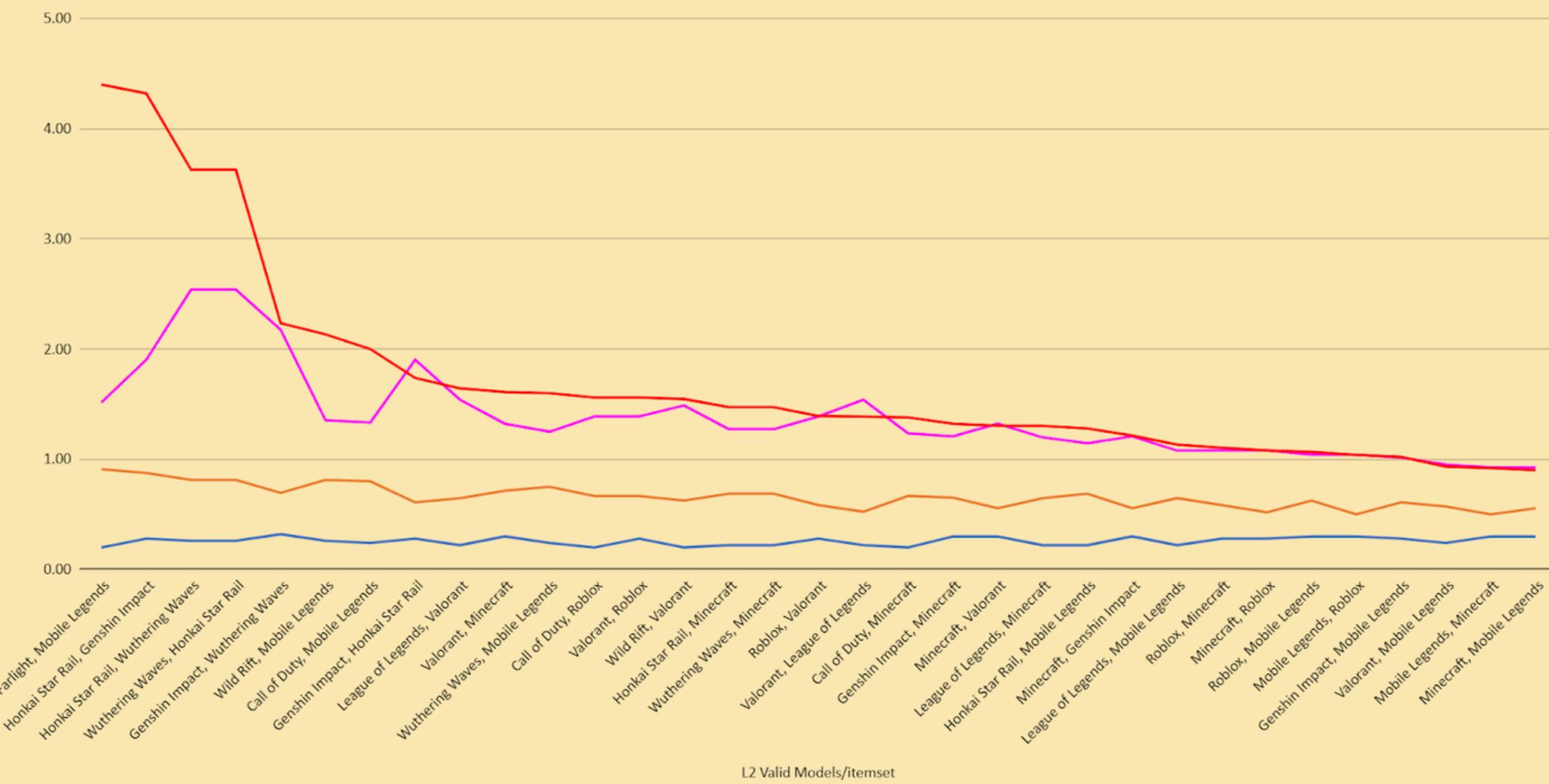
    #sorted by conviction
    sorted = asso.sort_values(by="conviction",ascending=False)
    print(sorted[["antecedents","consequents","support","confidence","lift","conviction"]].to_string())
```

ANALYSIS

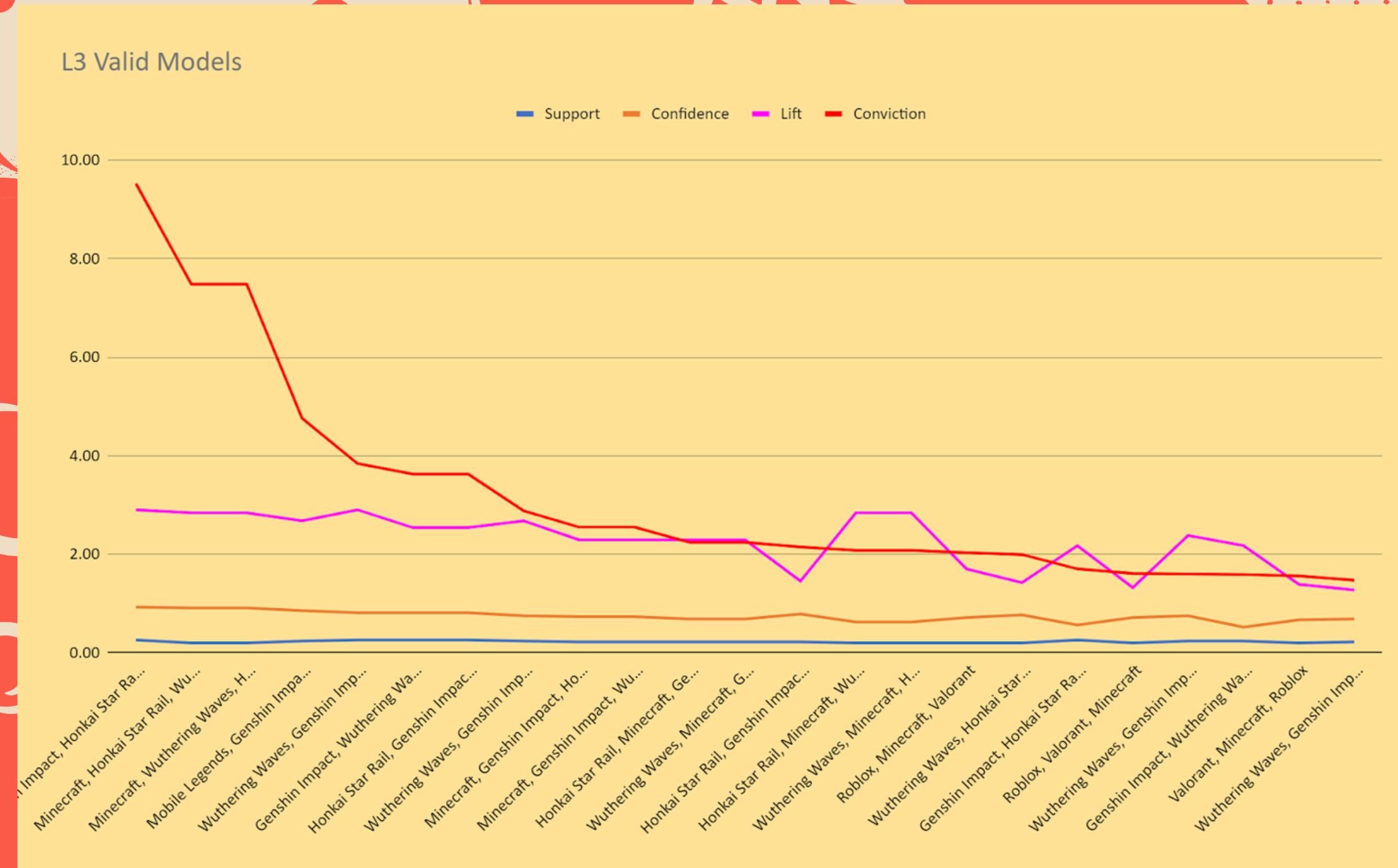


L2 Valid Models

— Support — Confidence — Lift — Conviction



**IN TERMS OF CONFIDENCE,
FARLIGHT → MOBILE LEGENDS
IS THE GAME COMBINATION
THAT'S 90.90% LIKELY TO BE
PLAYED TOGETHER BY A
PLAYER. IN TERMS OF LIFT,
HONKAIA STAR RAIL IS 2.53
TIMES MORE LIKELY TO BE
PLAYED WHEN THE PLAYER IS
ALREADY PLAYING WUTHERING
WAVES, RATHER THAN JUST
PICKING UP HONKAIA STAR RAIL
ON ITS OWN. IN TERMS OF
CONVICTION, IF A PLAYER
DOESN'T PLAY FARLIGHT, IT'S
4.4 TIMES THAT THEY ALSO
DON'T PLAY MOBILE LEGENDS.**



IN TERMS OF CONFIDENCE, IT IS 92.85% LIKELY THAT PEOPLE WHO PLAY GENSHIN IMPACT AND HONKA STAR RAIL ARE ALSO PLAYING WUTHERING WAVES. THIS CAN BE DUE TO THE REASON THAT THE ANTECEDENTS (GI AND HSR) ARE BOTH GAMES FROM THE SAME COMPANY AND WUTHERING WAVES HAVE A VERY SIMILAR STYLE TO THE TWO. IN TERMS OF LIFT, THE SAME GAME COMBINATIONS BETWEEN GI, HSR -> WW ARE ALSO IN THE LEAD. THIS MEANS THAT PEOPLE WHO PLAY GENSHIN IMPACT AND HONKA STAR RAIL ARE 2.90 TIMES MORE LIKELY TO PLAY WUTHERING WAVES COMPARED TO PICKING IT UP ON ITS OWN. IN TERMS OF CONVICTION, THE SAME GAME COMBINATION IS STILL LEADING OUT OF ALL COMBINATIONS. THIS MEANS THAT IF A PLAYER DOESN'T PLAY BOTH GI AND HSR, IT IS 9.52 TIMES MORE LIKELY THAT THEY ALSO DON'T PLAY WUTHERING WAVES.

**THANK YOU
FOR
LISTENING**