Project members

PMU-B: Global Partnership Scheme, Network Strengthening Fund (SHA)

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Overview of the project

Contextual gaming approach

Learning Management System (LMS)

Artificial Intelligence: AI Mode basing on the traditional machine learning approach as decision-tree technique

Students

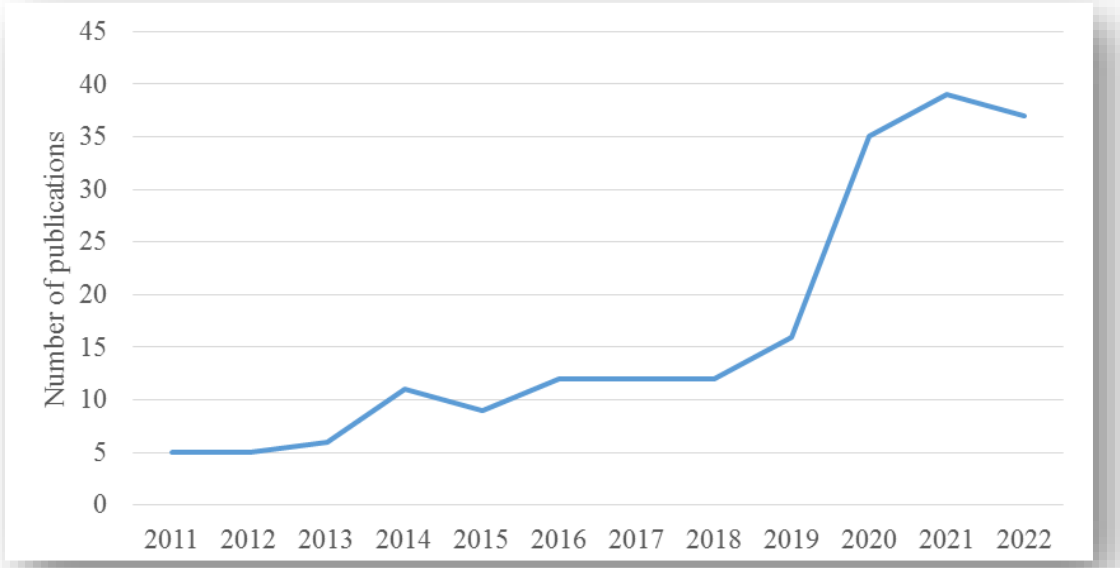
Leaner Dashboard

Feedback about learning behaviors related to exhibit digital citizenship behaviors

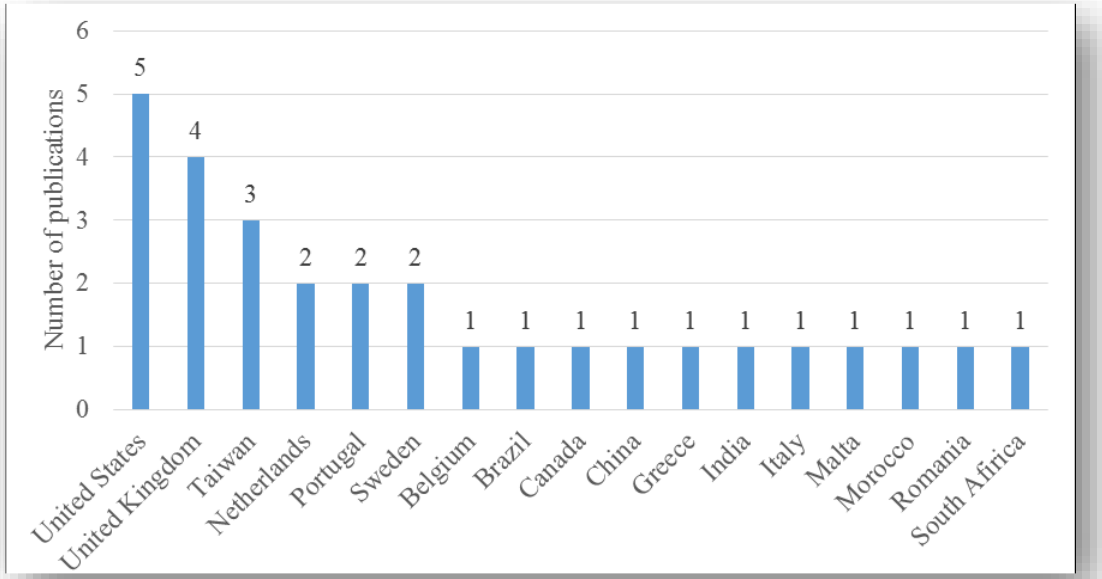
On-going project (1st year): A Systematic Review from 2011 to 2022

- **SCOPUS database**
- **Keyword:** “artificial intelligence” or “AI” AND “game-based learning” or “game”
- **Publishing type:** “article” in the category of “social science”
- **Inclusion criteria:** artificial intelligence in game-based learning in educational perspectives
- **Exclusion criteria:** commercial perspectives
- To outlining AI methods/techniques/strategies to support gaming functions and interfaces and put into practice actual gaming activities
- The final dataset for analysis: **22 articles** after removing 118 irrelevant articles

Data distributions: 4 major findings

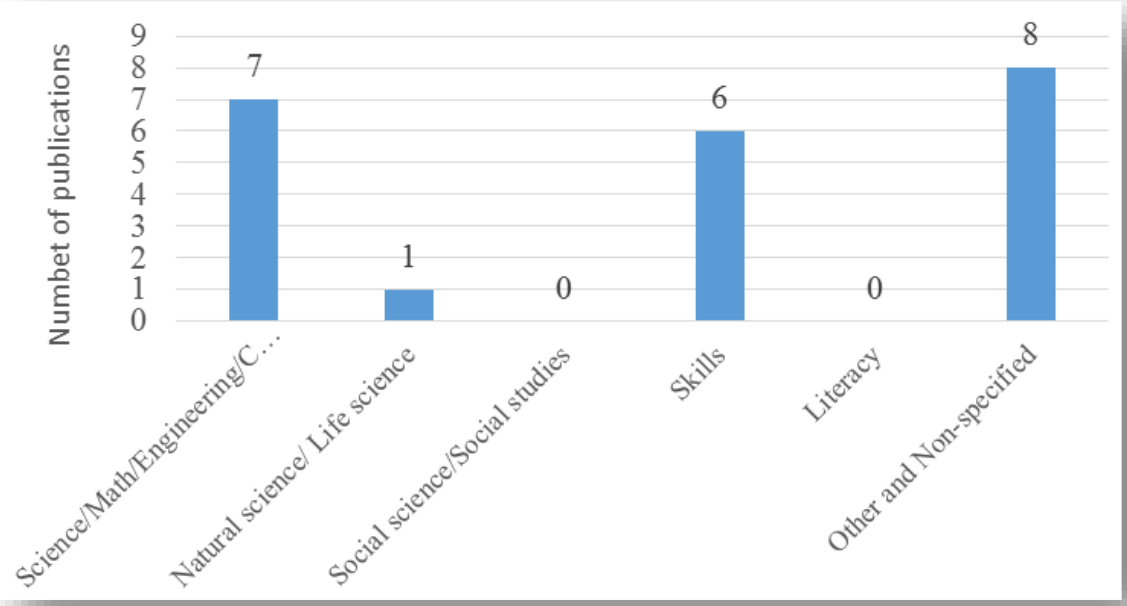


(1) The number of Scopus Indexed Journals' publications on Artificial Intelligence in game-based learning

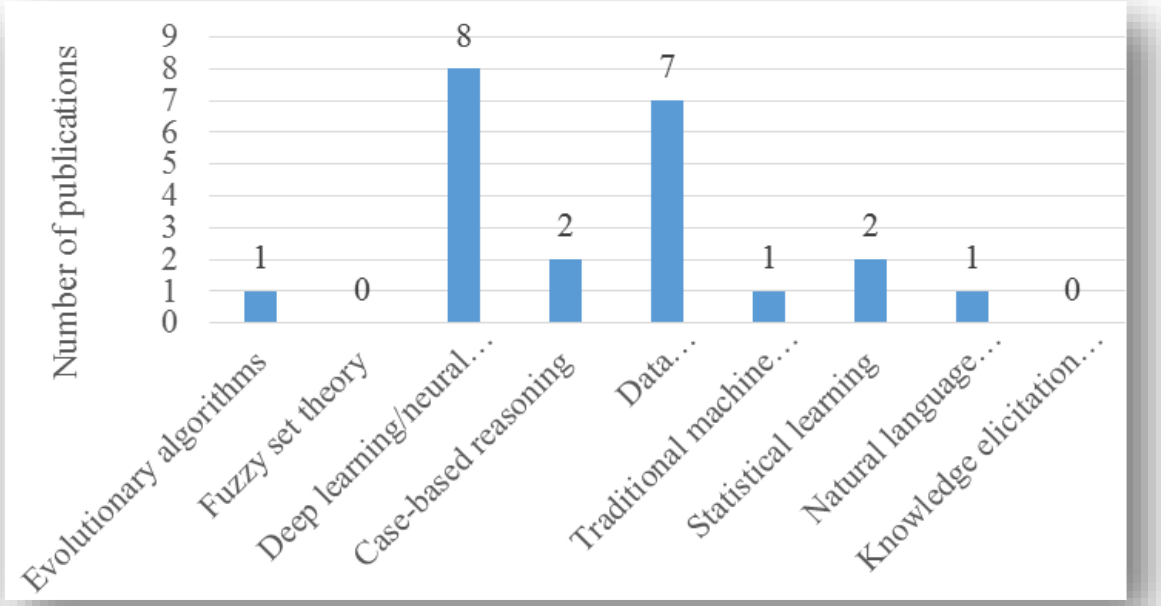


(2) The distribution of countries contributed to artificial intelligence in game-based learning

Data distributions: 4 major findings



(3) The distribution of learning contents contributed to artificial intelligence in game-based learning

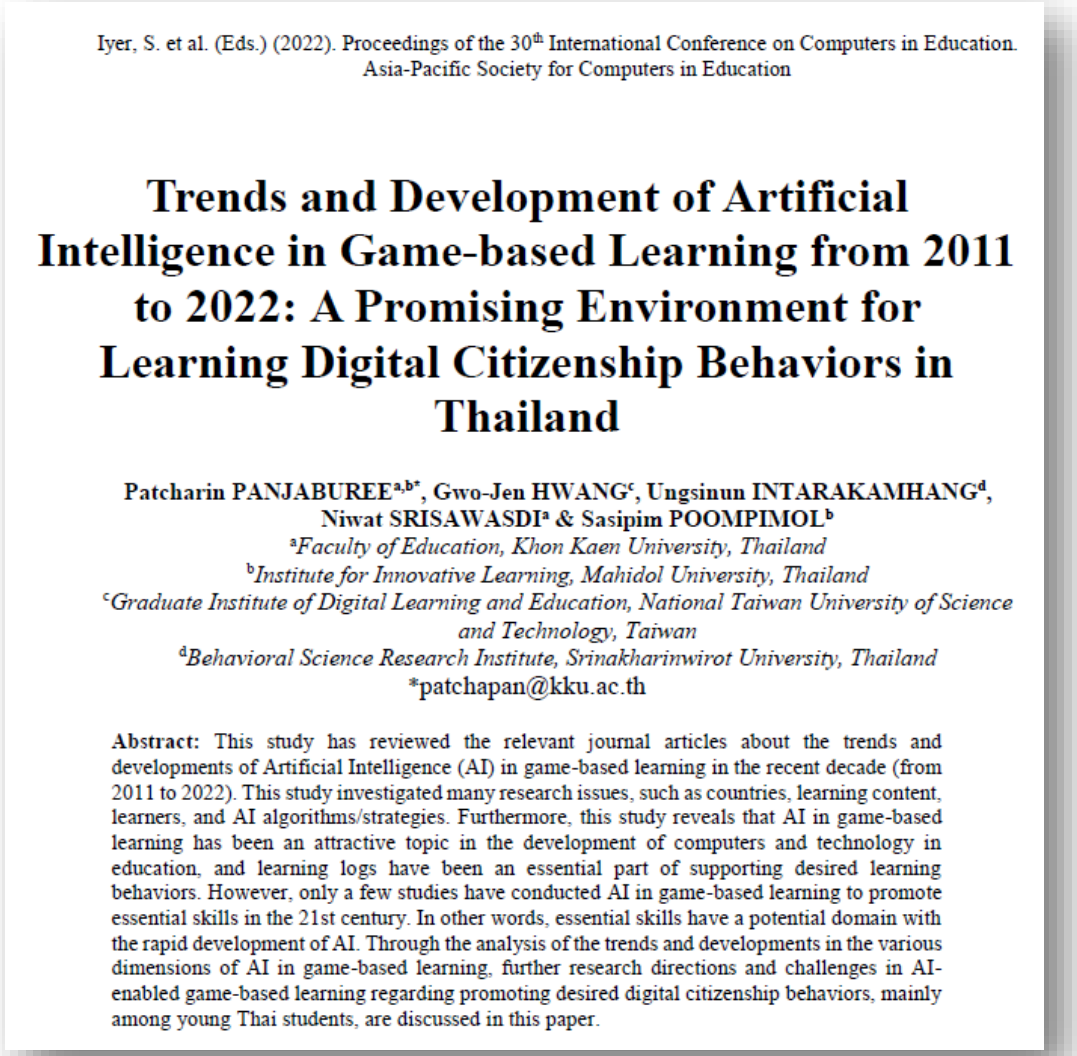


(4) The distribution of methods/mechanisms/strategies contributed to artificial intelligence in game-based learning

Challenges: AI in game-based learning to promote desired behaviors of digital Thai citizenship

- Preparing students to behave safely in cyberbullying, digital drama, digital relationships, digital relationships, and online communication (Tapingkae, P., Panjaburee, P.*, Hwang, G. J., & Srisawasdi, N., 2020).
- Using the **decision-tree technique** as an AI-based approach encourages students to make wise choices.
- Using **context-based learning** as an instructional design to create gaming activities that align students' conduct with digital citizenship or digital literacies.
- To compute and analyze **learners' actions and interactive patterns** in gaming activities to comprehend how to modify and adapt undesirable behaviors to desired behaviors.

Output



Iyer, S. et al. (Eds.) (2022). Proceedings of the 30th International Conference on Computers in Education. Asia-Pacific Society for Computers in Education

Trends and Development of Artificial Intelligence in Game-based Learning from 2011 to 2022: A Promising Environment for Learning Digital Citizenship Behaviors in Thailand

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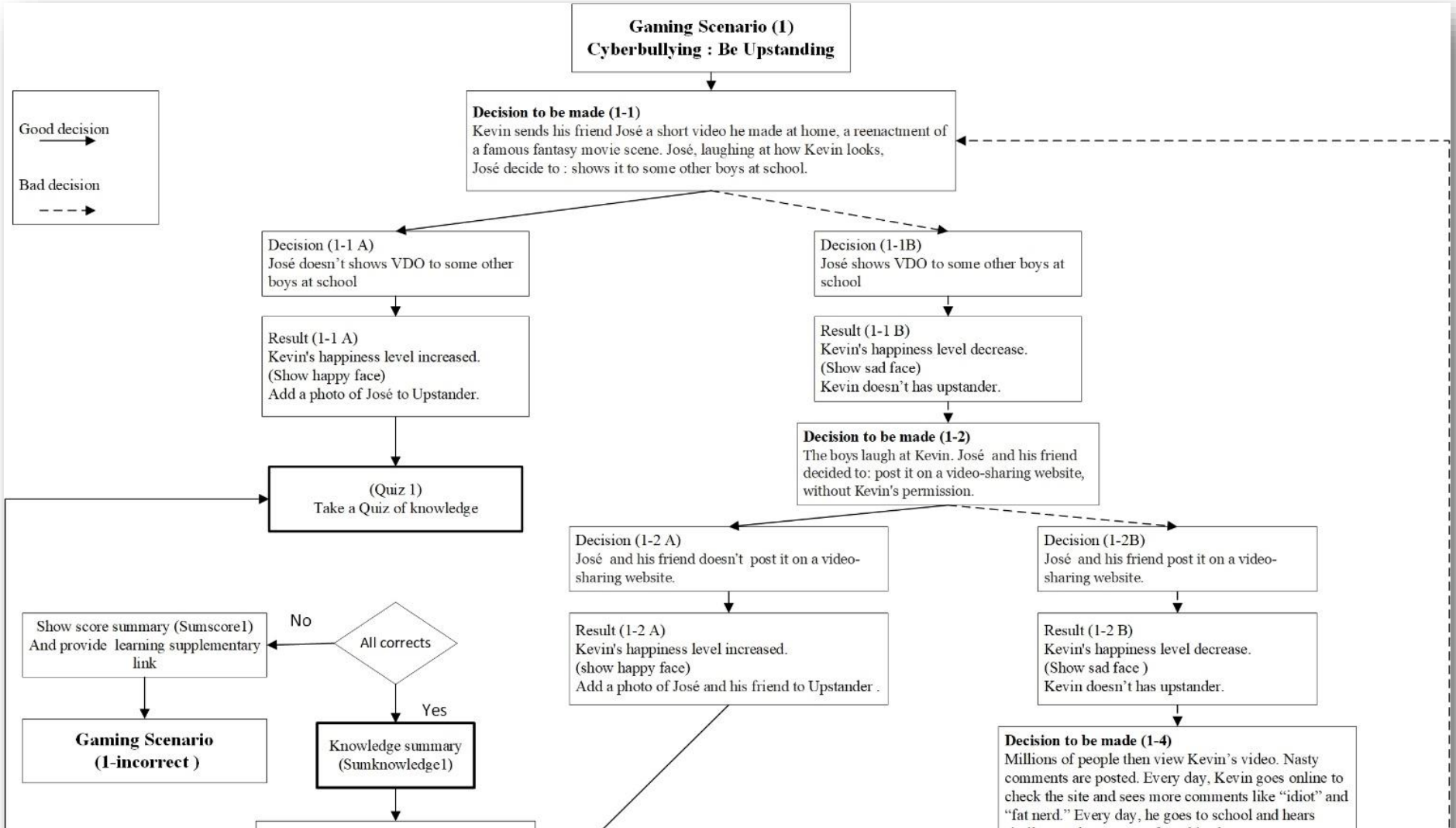
Abstract: This study has reviewed the relevant journal articles about the trends and developments of Artificial Intelligence (AI) in game-based learning in the recent decade (from 2011 to 2022). This study investigated many research issues, such as countries, learning content, learners, and AI algorithms/strategies. Furthermore, this study reveals that AI in game-based learning has been an attractive topic in the development of computers and technology in education, and learning logs have been an essential part of supporting desired learning behaviors. However, only a few studies have conducted AI in game-based learning to promote essential skills in the 21st century. In other words, essential skills have a potential domain with the rapid development of AI. Through the analysis of the trends and developments in the various dimensions of AI in game-based learning, further research directions and challenges in AI-enabled game-based learning regarding promoting desired digital citizenship behaviors, mainly among young Thai students, are discussed in this paper.

- Panjaburee, P., Hwang, G.J., Intarakamhang, U., & Srisawasdi, N. (2022, November 28 - December 2). Trends and Development of Artificial Intelligence in Game-based Learning from 2011 to 2022: A Promising Environment for Learning Digital Citizenship Behaviors in Thailand. *In Proceedings of the 30th International Conference on Computers in Education 2022.* Asia-Pacific Society for Computers in Education, Taiwan. (Inpress)

Example of Decision Tree



Prototype in Thai version to further English version

Video

Contextual gaming approach on students' digital citizenship behaviours, learning motivations, and perceptions

Learning logs from the 1st pilot study for further precise algorithm of learning behavior and pattern analysis to develop desired digital citizenship behaviors

path_id	game_id	student_id	scenario_id	path_detail	time	Quiz_score
70	150	21	1	(1-1)B(1-2)A(1-4)B(1-1)A	45	1
71	152	21	1	(1-1)B(1-2)A(1-4)B(1-1)A(1-1)B(1-2)A(1-4)B(1-1)B(1-2)	75	4
72	153	0	1	(1-1)B(1-2)A(1-4)A(1-5)A(1-3)A	193	1
73	154	0	1	(1-1)B(1-2)A(1-4)A(1-5)A(1-3)A(1-1)A		
74	158	0	1	(1-1)A		
75	171	0	1	(1-1)A		
76	171	0	1	(1-1)B(1-2)B(1-3)A		
77	174	0	1	(1-1)A		
78	175	0	1	(1-1)A		
79	175	0	1	(1-3)A		
80	175	0	1	(1-4)A(1-5)A(1-3)A		
81	177	0	1	(1-1)B(1-2)B(1-3)A		
82	194	0	1	(1-1)A		
83	186	0	1	(1-1)B(1-2)B(1-3)A		
84	190	0	1	(1-1)A		
85	198	0	1	(1-1)A		
86	201	39	1	(1-1)A		
87	177	0	1	(1-1)A		
88	200	0	1	(1-1)A		
89	200	0	1	(1-1)A		
90	201	39	1	(1-3)A		
91	200	0	1	(1-1)A		
92	195	0	1	(1-1)A		
93	199	0	1	(1-1)A		
94	199	0	1	(1-1)A		
95	200	0	1	(1-1)A		
96	200	0	1	(1-1)A		
97	200	0	1	(1-1)A(1-1)A		
98	198	0	1	(1-1)B(1-2)B(1-3)A		
99	202	0	1	(1-1)A		
100	177	0	1	(1-1)B(1-2)A(1-4)A(1-5)B(1-3)A		
101	186	0	1	(1-1)A		
102	190	0	1	(1-1)A(1-1)B(1-2)A(1-4)B(1-1)B(1-2)B(1-3)A		

2526	2084	6144	3	(3-7)A(3-8)A(3-9)A(3-10)A(3-11)A(3-12)A(3-13)A(3-14	195	0
2527	2138	6693	4	(4-1)B(4-2)A(4-2)B(4-3)A(4-5)A(4-6)B(4-7)A(4-9)A(4-1	139	3
2528	2131	6163	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)B(4-10)A	171	2
2529	0	7144	3	(3-1)B(3-2)B(3-3)B(3-4)A(3-5)A(3-6)B(3-7)B(3-8)B(3-9)	146	2
2530	2165	6693	4	(4-1)A(4-4)B(4-1)B(4-2)B(4-3)A(4-5)B(4-8)A(4-6)B(4-7)	40	1
2531	2157	5808	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)B(4-10)A(4-1	60	6
2532	2153	7134	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)A(4-12)B(4-9	86	5
2533	0	8904	3	(3-1)A(3-2)B(3-3)B(3-4)A(3-5)A(3-6)B(3-7)B(3-8)B(3-9)	137	2
2534	2173	6693	4	(4-1)A(4-4)B(4-1)B(4-2)A(4-2)B(4-3)A(4-5)B(4-8)A(4-6)	36	4
2535	2161	6163	4	(4-1)B(4-2)B(4-3)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)B(4-10	139	4
2536	0	7144	3	(3-7)A(3-8)B(3-9)A(3-10)B(3-11)A(3-12)B(3-13)A(3-14)	92	2
2537	2178	6693	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)B(4-10)B	25	3
2538	2159	7152	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)B(4-10)A(4-1	189	6
2539	2163	7151	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)B(4-10)A(4-1	190	6
2540	2156	5797	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)B(4-10)A(4-1	215	1
2541	2164	5821	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)B(4-10)A(4-1	193	3
2542	2075	6876	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)B(4-10)A(4-1	334	6
2543	0	8904	3	(3-7)B(3-8)B(3-9)B(3-10)A(3-11)B(3-12)B(3-13)B(3-14)	99	1
2544	0	6144	3	(3-1)A(3-2)B(3-3)B(3-4)A(3-5)A(3-6)B(3-7)A(3-8)A(3-9)	210	3
2545	2142	5803	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-8)A(4-6)B(4-7)B(4-9)B(4-10	294	6
2546	0	7134	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)B(4-10)A(4-1	60	2
2547	0	6693	4	(4-1)B(4-2)A(4-2)A(4-2)B(4-3)B(4-3)A(4-5)A(4-6)B(4-7)	32	4
2548	2184	5797	4	(4-1)B(4-2)B(4-3)A(4-5)B(4-8)B(4-5)A(4-6)A(4-6)A(4-6)	58	3
2549	2179	6163	4	(4-1)B(4-2)A(4-2)A(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)	156	6
2550	2133	7142	4	(4-1)B(4-2)B(4-3)A(4-5)B(4-8)A(4-6)B(4-7)B(4-9)B(4-10	488	4
2551	2109	5807	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)B(4-10)A(4-1	773	5
2552	2185	6693	4	(4-1)B(4-2)A(4-2)B(4-3)A(4-5)A(4-6)B(4-7)A(4-9)B(4-10	39	5
2553	2167	6299	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)B(4-10)A(4-1	262	5
2554	2168	7253	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)A(4-9)B(4-10)A(4-1	126	5
2555	0	7144	3	(3-7)B(3-8)A(3-9)A(3-10)B(3-11)A(3-12)B(3-13)A(3-14)	106	3
2556	2184	5797	4	(4-5)B(4-8)B(4-5)A(4-6)A(4-6)A(4-6)B(4-7)B(4-9)B(4-10	72	4
2557	2158	6808	4	(4-1)B(4-2)B(4-3)A(4-5)A(4-6)B(4-7)B(4-9)B(4-10)A(4-1	341	5
2558	0	8904	3	(3-1)A(3-2)B(3-3)B(3-4)A(3-5)A(3-6)B(3-7)B(3-8)B(3-9)	196	2
2559	2168	7253	4	(4-9)B(4-10)A(4-11)A	67	5
2560	2185	6693	4	(4-5)A(4-6)B(4-7)A(4-9)B(4-10)A(4-11)B(4-11)A	77	4

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Thank You.

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