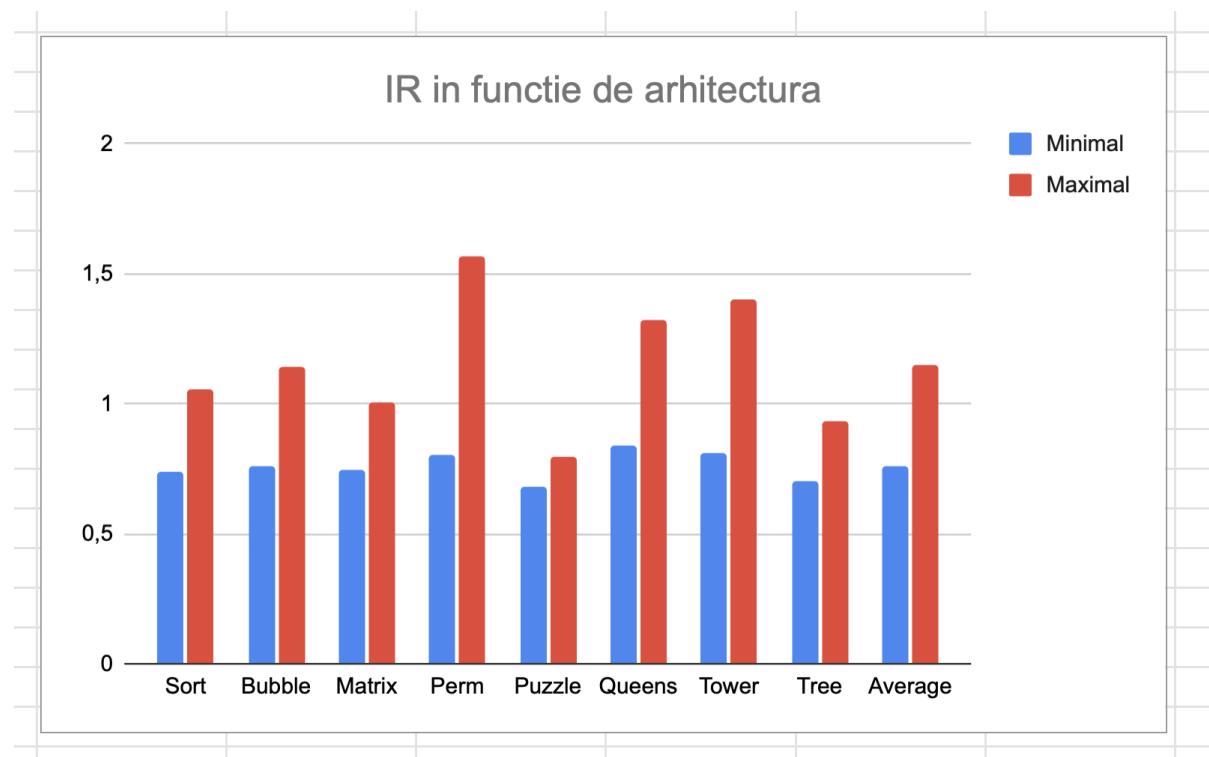


## LABORATOR 2

	cicli	instructiuni		IR	Minimal	Maximal
sort min	97983	72101		Sort	0,736	1,057
sort max	68203	72101		Bubble	0,757	1,141
bubble min	271996	206035		Matrix	0,748	1,004
bubble max	180640	206035		Perm	0,802	1,566
matrix min	309973	231814		Puzzle	0,683	0,792
matrix max	230860	231814		Queens	0,843	1,319
perm min	443567	355643		Tower	0,814	1,399
perm max	227164	355643		Tree	0,702	0,934
puzzle min	10000001	6825651		Average	0,760	1,151
puzzle max	8614302	6825651				
queens min	244991	206420				
queens max	156537	206420				
tower min	308715	251149				
tower max	179478	251149				
tree min	193877	136040				
tree max	145679	136040				



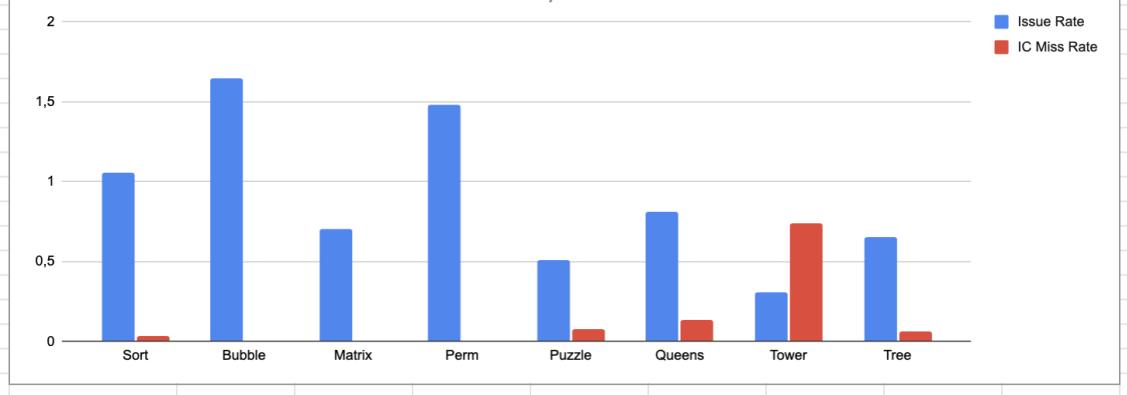
Concluzii: Modelul maximal este mai performant decat modelul minimal din punct de vedere al ratei de procesare , dar spre deosebire de modelul minimal care foloseste o unitate de executie, modelul maximal foloseste 16.

## LABORATOR 3

### Exercitiul 1

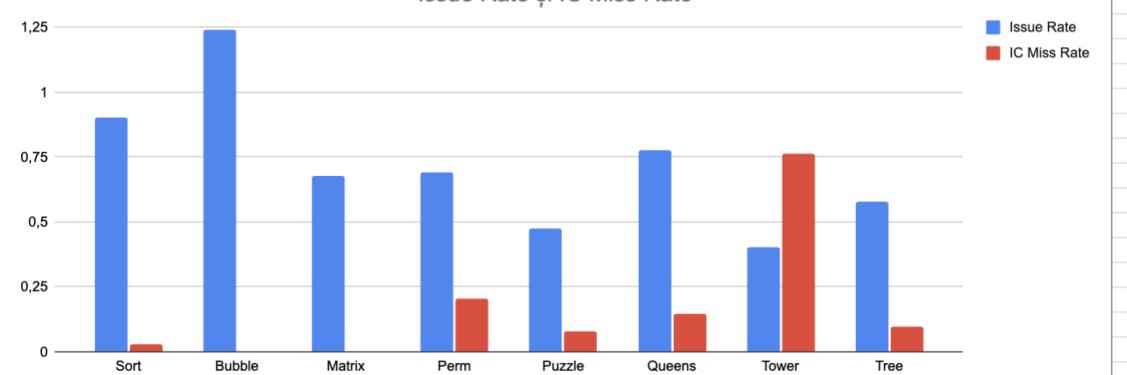
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Issue Rate	1,058	1,648	0,705	1,483	0,505	0,808	0,308	0,651
IC Miss Rate	3,50%	0,05%	0,05%	0,03%	7,79%	13,30%	74,04%	6,06%

Issue Rate și IC Miss Rate



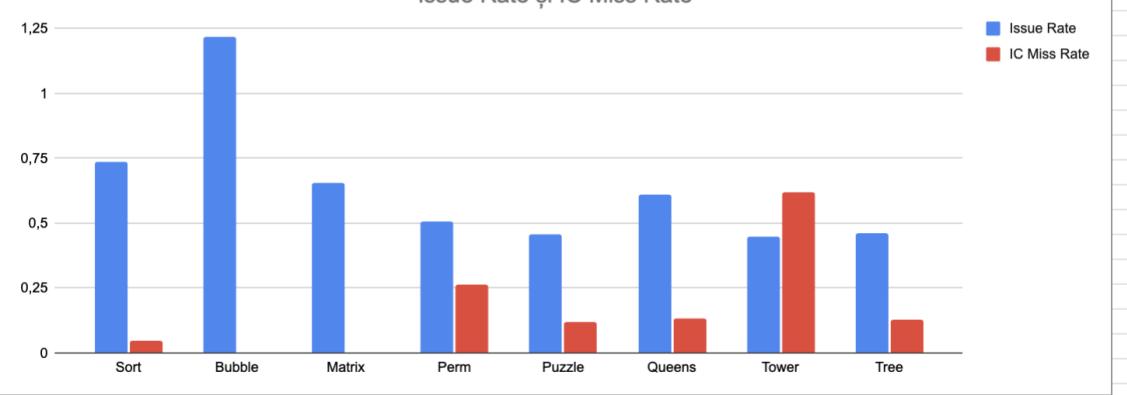
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Issue Rate	0,904	1,242	0,678	0,692	0,474	0,777	0,401	0,578
IC Miss Rate	3,09%	0,04%	0,05%	20,38%	7,94%	14,82%	76,46%	9,52%

Issue Rate și IC Miss Rate



	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Issue Rate	0,737	1,218	0,654	0,505	0,455	0,608	0,45	0,462
IC Miss Rate	4,70%	0,05%	0,06%	26,13%	12,00%	13,20%	61,70%	12,94%

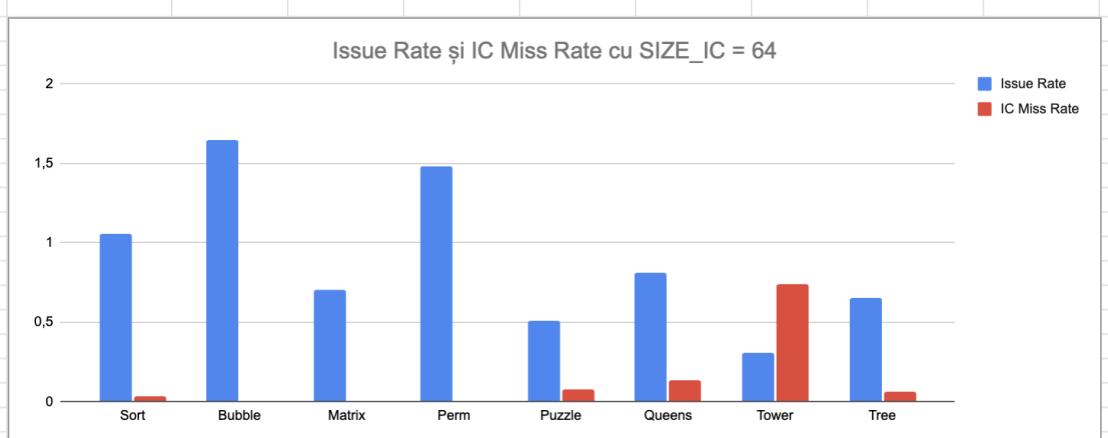
Issue Rate și IC Miss Rate



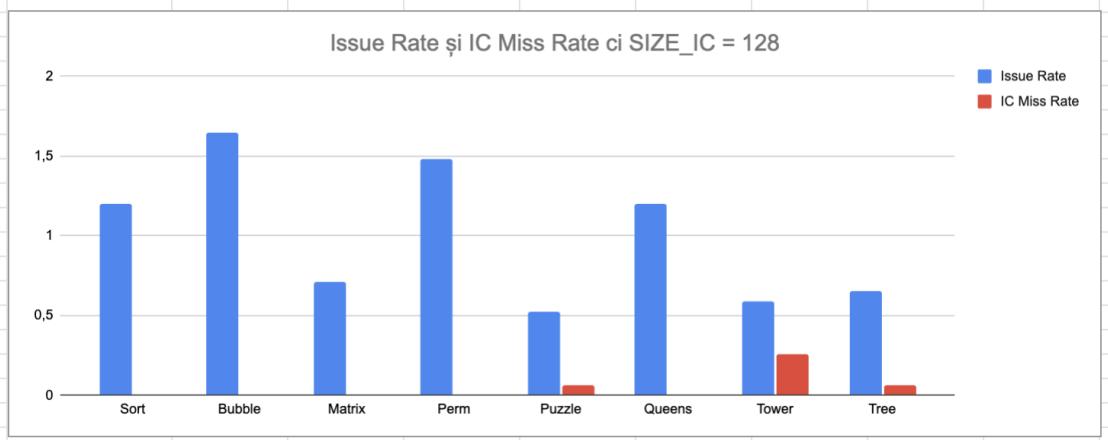
**Concluzii:** Pentru majoritatea benchmark-urilor un FR = 4 a ajutat cel mai mult ISSUE RATE-ul.

<b>Exercitiul 2</b>								
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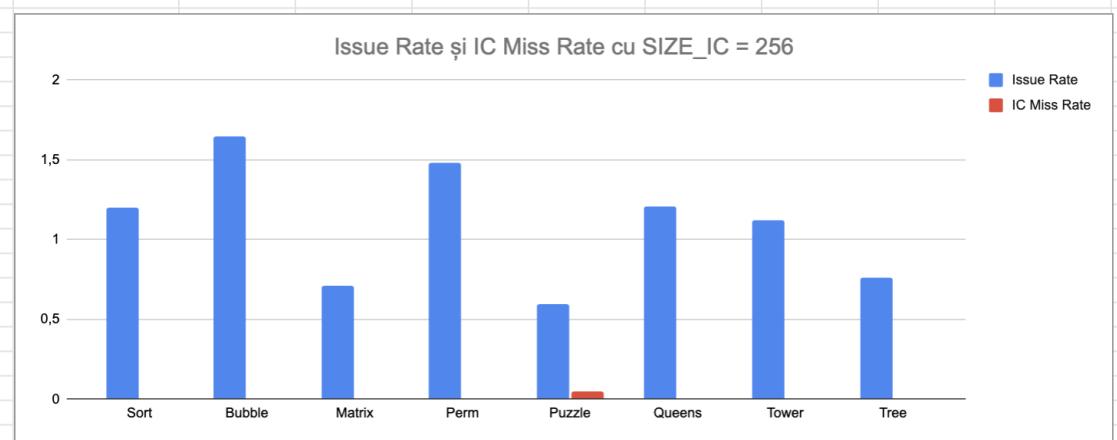
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
<b>Issue Rate</b>	1,058	1,648	0,705	1,483	0,505	0,808	0,308	0,651
<b>IC Miss Rate</b>	3,50%	0,05%	0,05%	0,03%	7,79%	13,30%	74,04%	6,06%



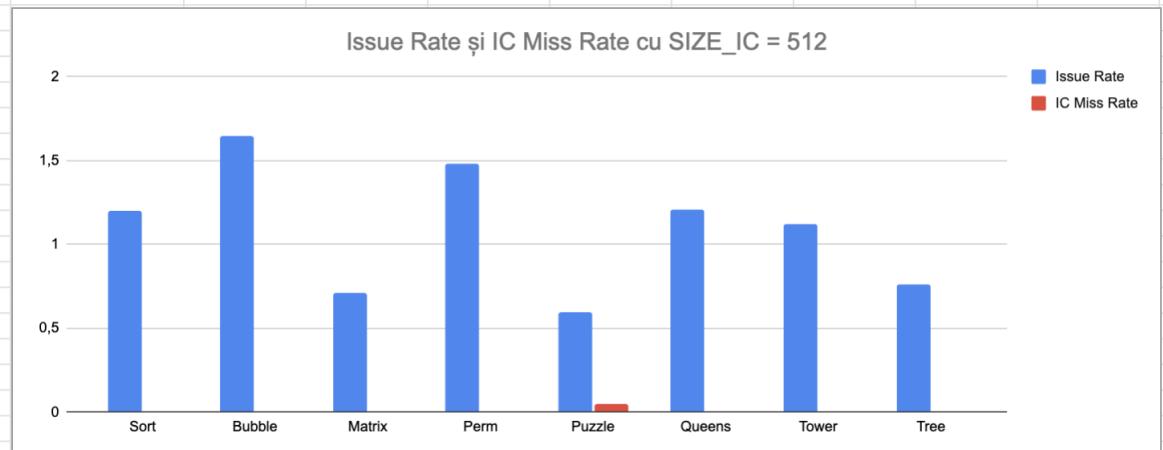
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
<b>Issue Rate</b>	1,196	1,648	0,706	1,484	0,524	1,201	0,586	0,651
<b>IC Miss Rate</b>	0,18%	0,05%	0,05%	0,02%	6,00%	0,20%	25,65%	6,06%



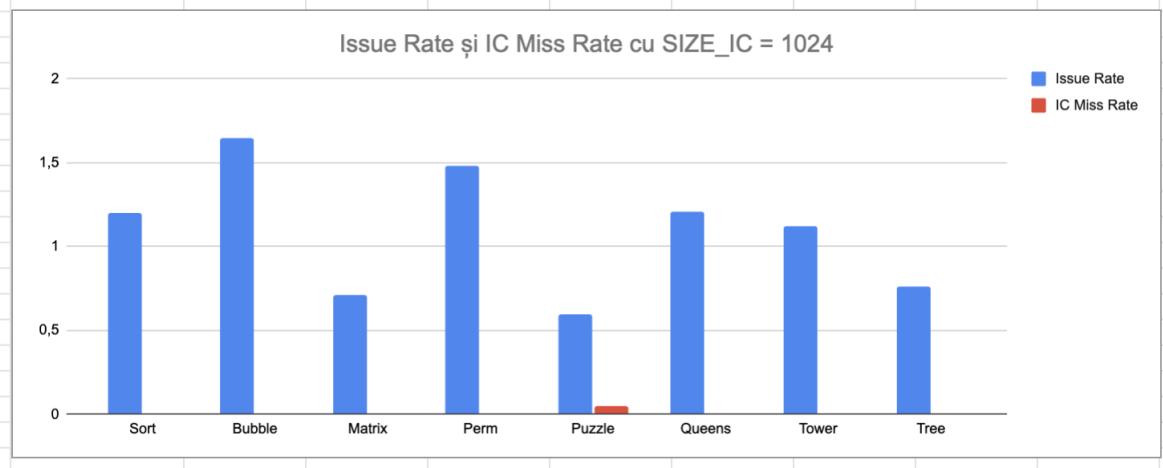
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
<b>Issue Rate</b>	1,196	1,648	0,706	1,484	0,595	1,207	1,120	0,759
<b>IC Miss Rate</b>	0,17%	0,05%	0,05%	0,02%	0,05%	0,07%	0,08%	0,10%



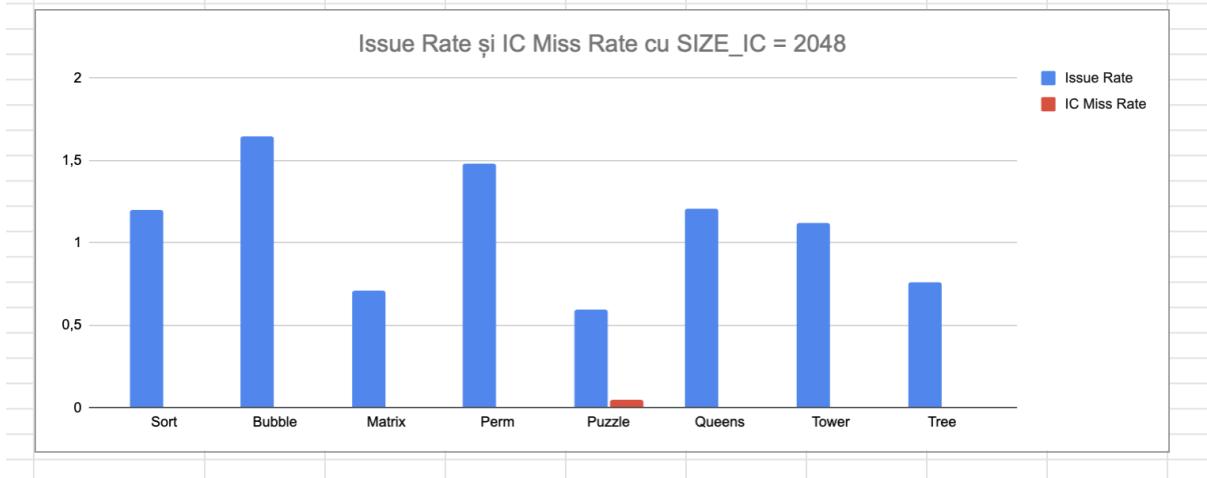
	<b>Sort</b>	<b>Bubble</b>	<b>Matrix</b>	<b>Perm</b>	<b>Puzzle</b>	<b>Queens</b>	<b>Tower</b>	<b>Tree</b>
<b>Issue Rate</b>	1,196	1,648	0,706	1,484	0,595	1,207	1,120	0,759
<b>IC Miss Rate</b>	0,17%	0,05%	0,05%	0,02%	0,05	0,07%	0,08%	0,10%



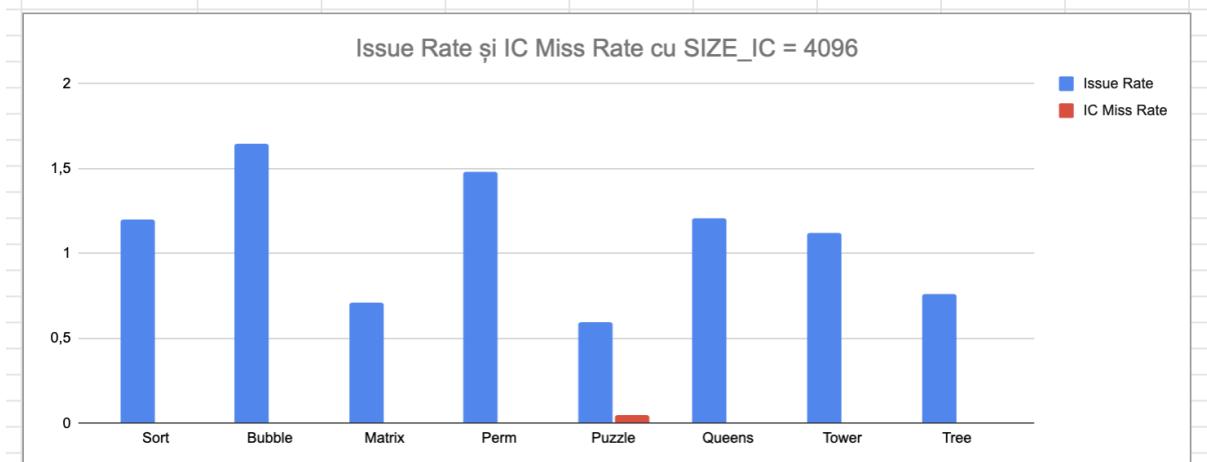
	<b>Sort</b>	<b>Bubble</b>	<b>Matrix</b>	<b>Perm</b>	<b>Puzzle</b>	<b>Queens</b>	<b>Tower</b>	<b>Tree</b>
<b>Issue Rate</b>	1,196	1,648	0,706	1,484	0,595	1,207	1,120	0,759
<b>IC Miss Rate</b>	0,17%	0,05%	0,05%	0,02%	0,05	0,07%	0,08%	0,10%



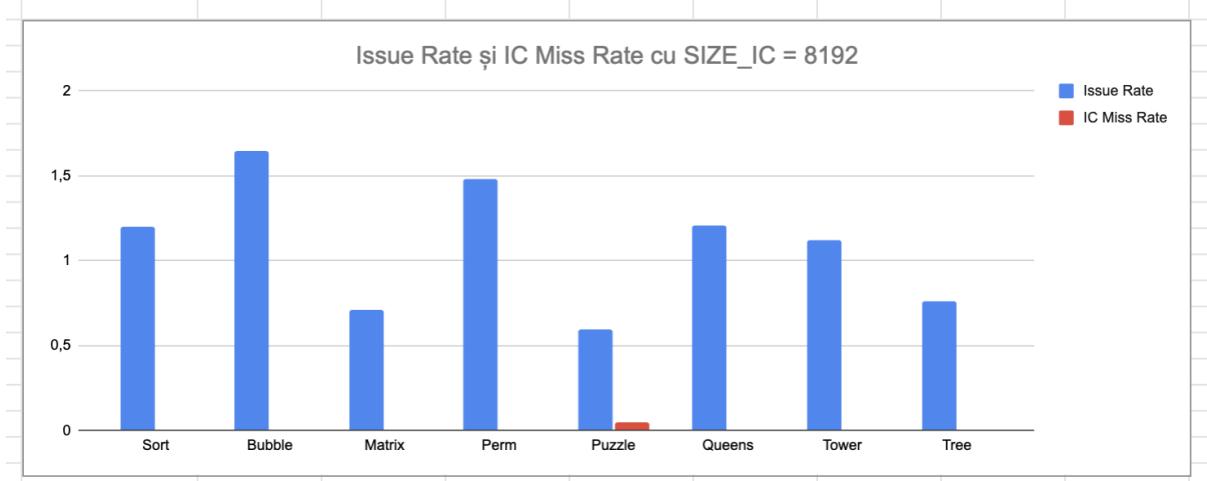
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Issue Rate	1,196	1,648	0,706	1,484	0,595	1,207	1,120	0,759
IC Miss Rate	0,17%	0,05%	0,05%	0,02%	0,05	0,07%	0,08%	0,10%



	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Issue Rate	1,196	1,648	0,706	1,484	0,595	1,207	1,120	0,759
IC Miss Rate	0,17%	0,05%	0,05%	0,02%	0,05	0,07%	0,08%	0,10%



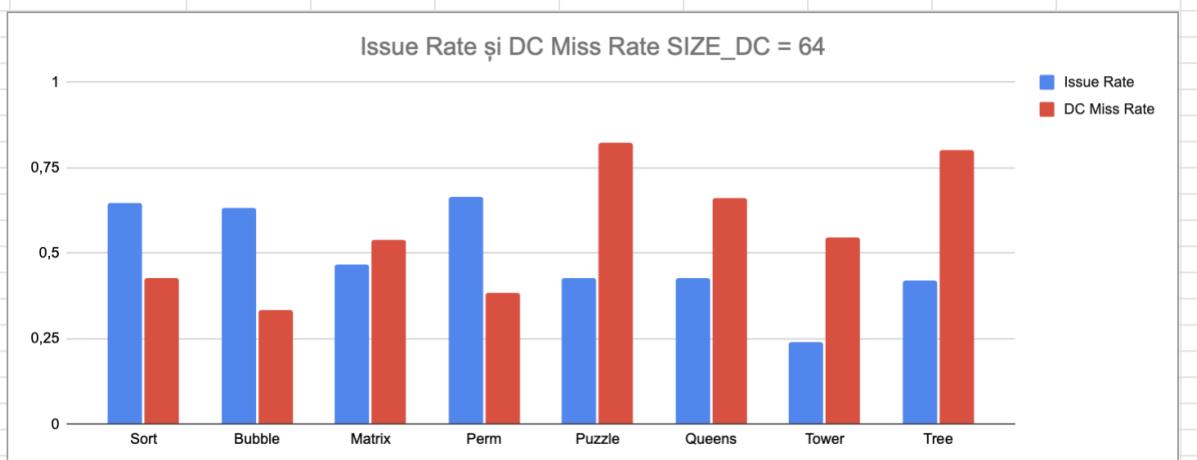
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Issue Rate	1,196	1,648	0,706	1,484	0,595	1,207	1,120	0,759
IC Miss Rate	0,17%	0,05%	0,05%	0,02%	0,05	0,07%	0,08%	0,10%



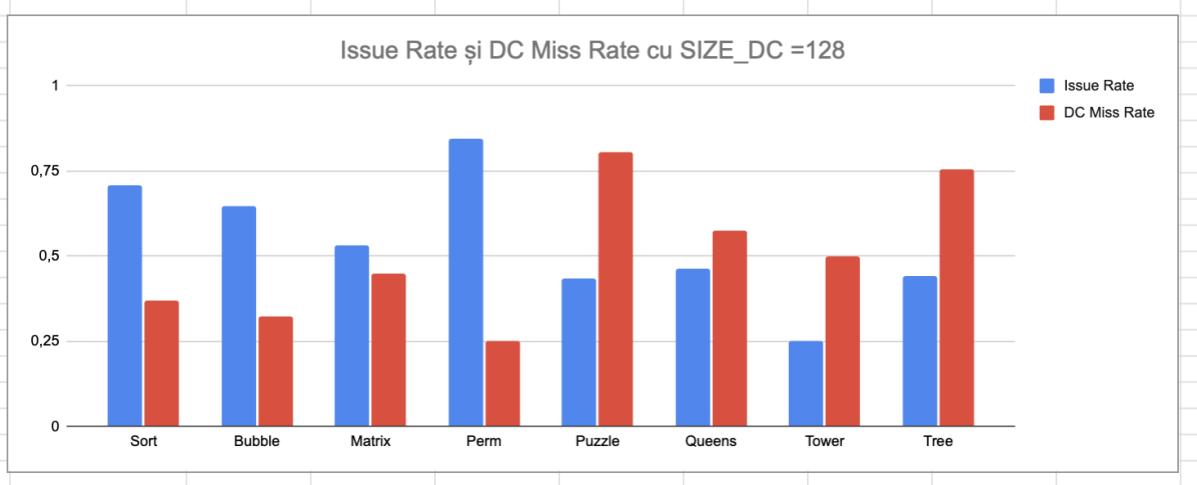
**Concluzii:** Cache-urile mai mari de 256 pt instrutiuni nu sunt viabile deoarece nu aduc nici o performanta asupra Issue Rate.

### Exercitiu 3

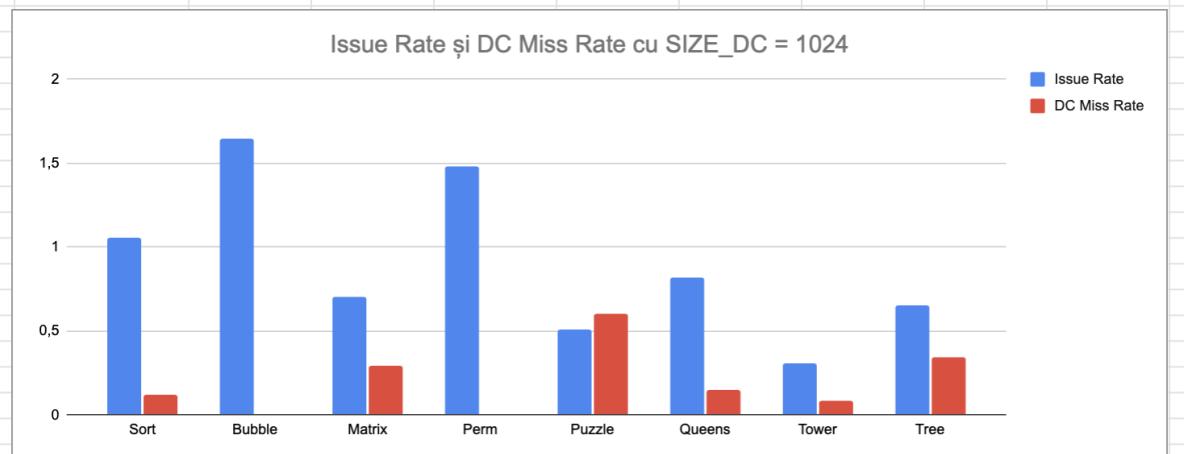
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Issue Rate	0,648	0,632	0,468	0,664	0,428	0,428	0,241	0,419
DC Miss Rate	42,52%	33,37%	53,76%	38,48%	82,20%	65,94%	54,47%	80,17%



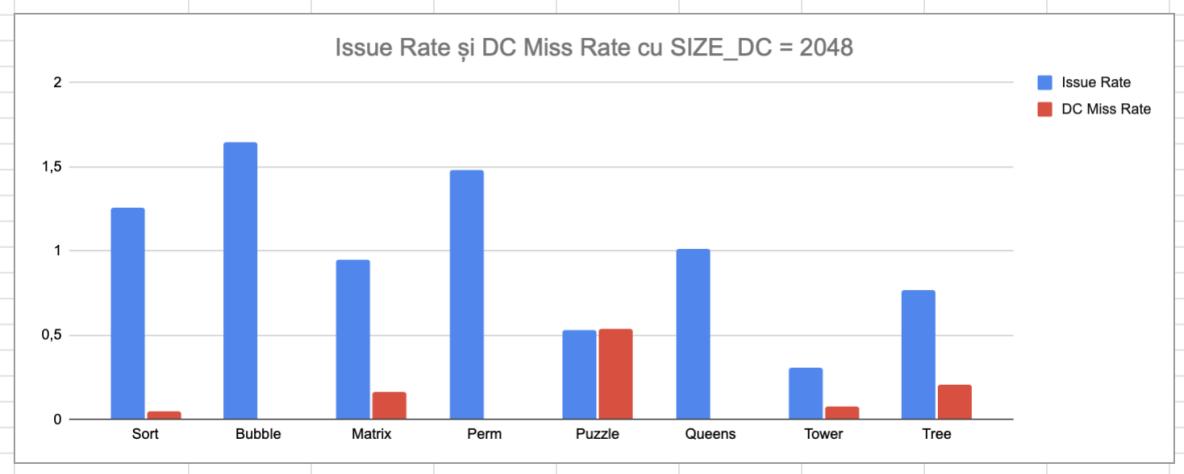
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Issue Rate	0,707	0,647	0,532	0,845	0,433	0,462	0,252	0,44
DC Miss Rate	36,88%	32,13%	44,88%	25,11%	80,62%	57,63%	49,86%	75,41%



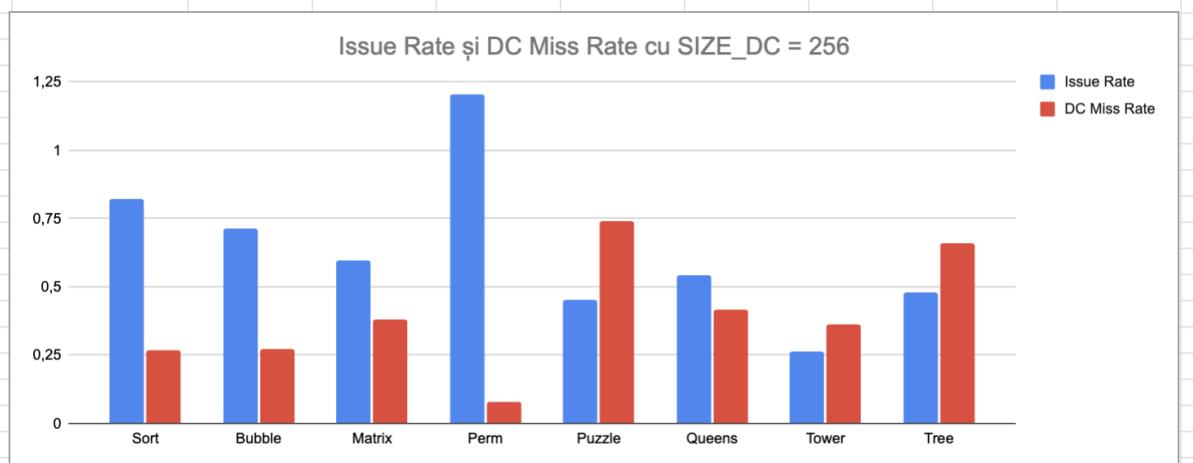
	<b>Sort</b>	<b>Bubble</b>	<b>Matrix</b>	<b>Perm</b>	<b>Puzzle</b>	<b>Queens</b>	<b>Tower</b>	<b>Tree</b>
<b>Issue Rate</b>	1,058	1,648	0,705	1,483	0,505	0,818	0,308	0,651
<b>DC Miss Rate</b>	12,10%	0,36%	28,84%	0,04%	60,21%	14,75%	7,93%	34,54%



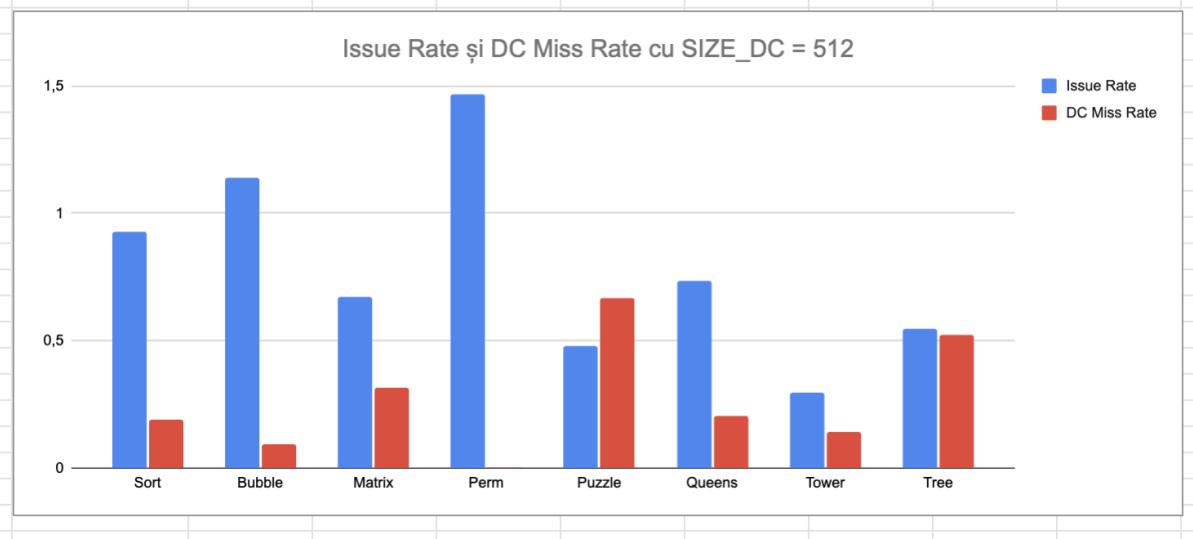
	<b>Sort</b>	<b>Bubble</b>	<b>Matrix</b>	<b>Perm</b>	<b>Puzzle</b>	<b>Queens</b>	<b>Tower</b>	<b>Tree</b>
<b>Issue Rate</b>	1,257	1,649	0,948	1,483	0,529	1,009	0,308	0,77
<b>DC Miss Rate</b>	4,87%	0,34%	16,27%	0,03%	53,70%	0,22%	7,55%	20,69%



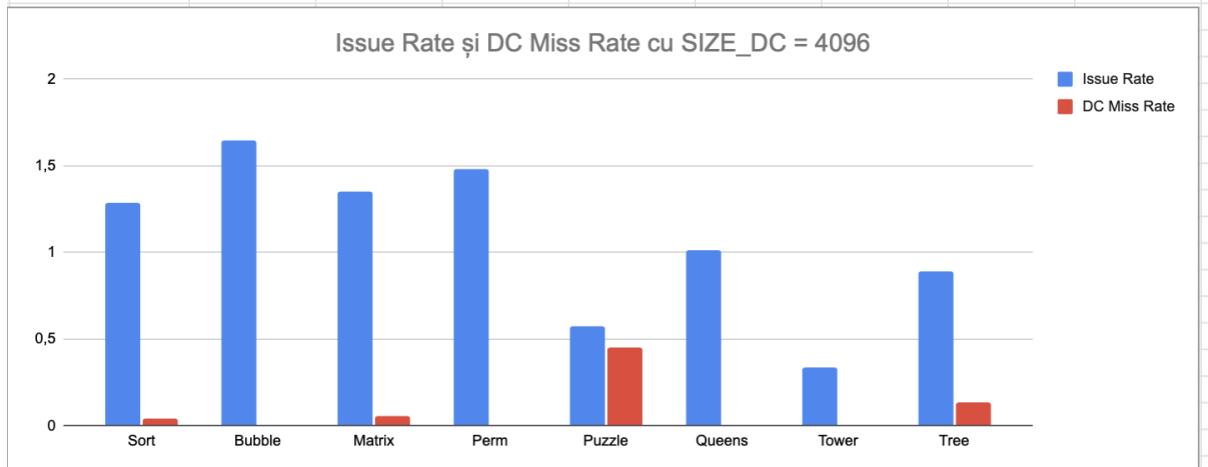
	<b>Sort</b>	<b>Bubble</b>	<b>Matrix</b>	<b>Perm</b>	<b>Puzzle</b>	<b>Queens</b>	<b>Tower</b>	<b>Tree</b>
<b>Issue Rate</b>	0,82	0,715	0,595	1,206	0,454	0,543	0,264	0,48
<b>DC Miss Rate</b>	26,88%	27,18%	38,00%	7,64%	74,29%	41,59%	36,17%	65,74%



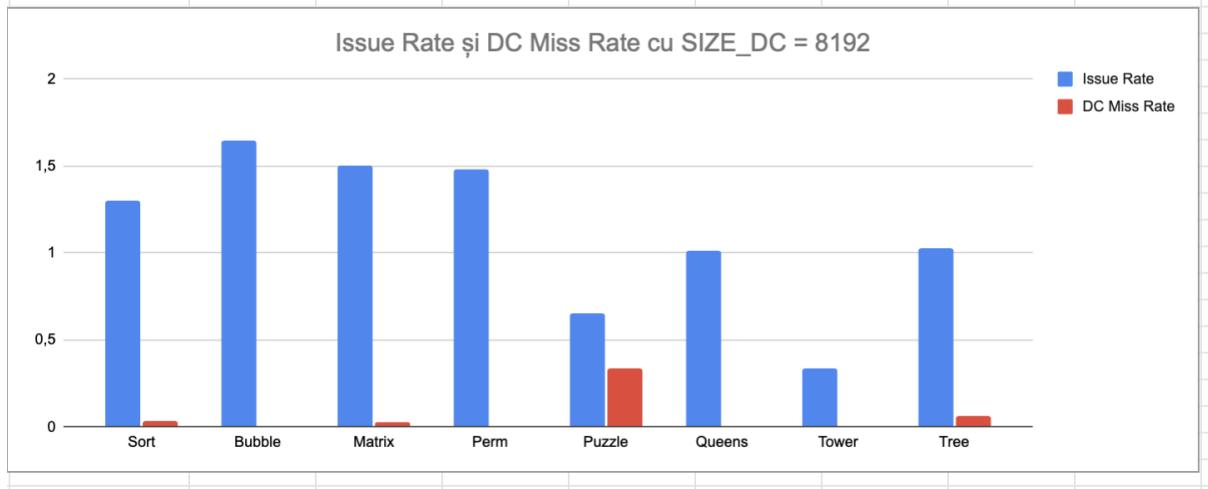
	<b>Sort</b>	<b>Bubble</b>	<b>Matrix</b>	<b>Perm</b>	<b>Puzzle</b>	<b>Queens</b>	<b>Tower</b>	<b>Tree</b>
<b>Issue Rate</b>	0,928	1,139	0,67	1,468	0,481	0,733	0,297	0,546
<b>DC Miss Rate</b>	19,05%	9,54%	31,42%	0,37%	66,54%	20,70%	14,14%	52,24%



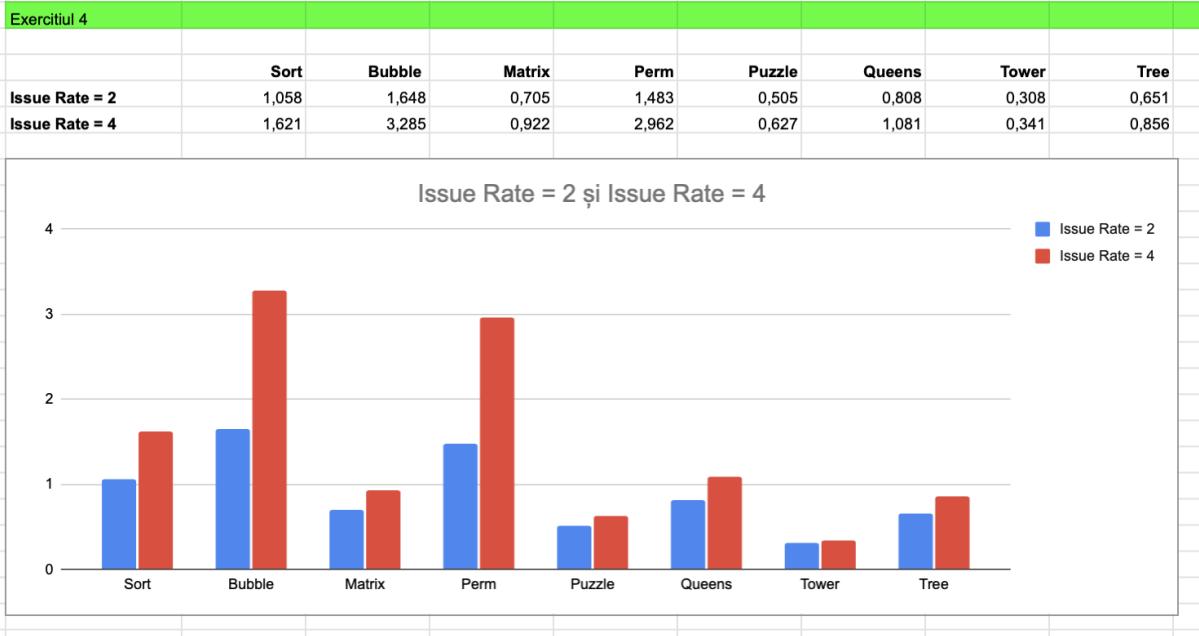
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Issue Rate	1,288	1,649	1,354	1,483	0,576	1,009	0,334	0,888
DC Miss Rate	3,76%	0,34%	5,32%	0,03%	44,72%	0,22%	0,11%	13,54%



	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Issue Rate	1,297	1,649	1,5	1,483	0,649	1,009	0,334	1,027
DC Miss Rate	3,36%	0,34%	2,83%	0,03%	33,16%	0,22%	0,11%	6,44%

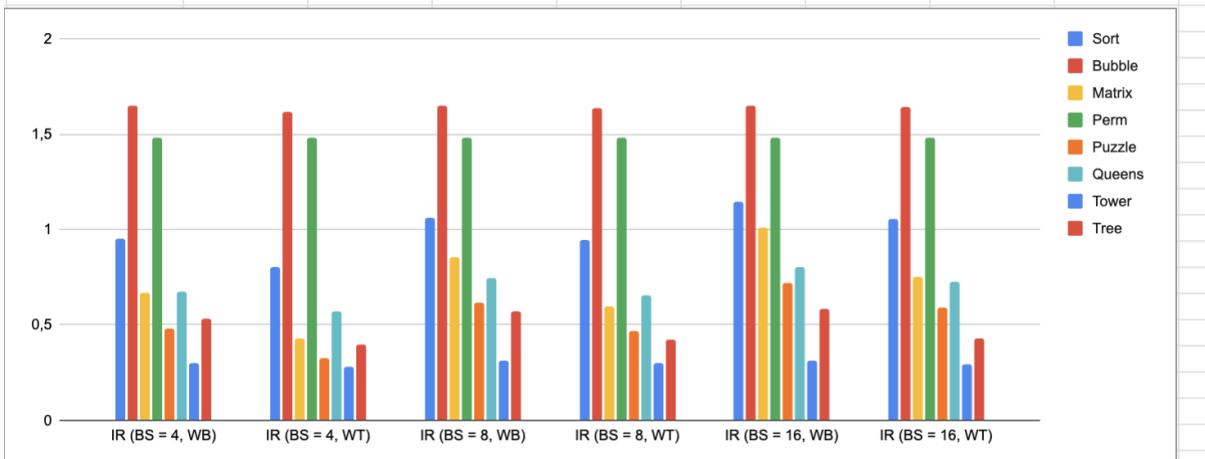


Concluzii: Folosirea unui cache de date cat mai mare creste performanta Issue Rate si scade considerabil Miss Rate in cache-ul de date.

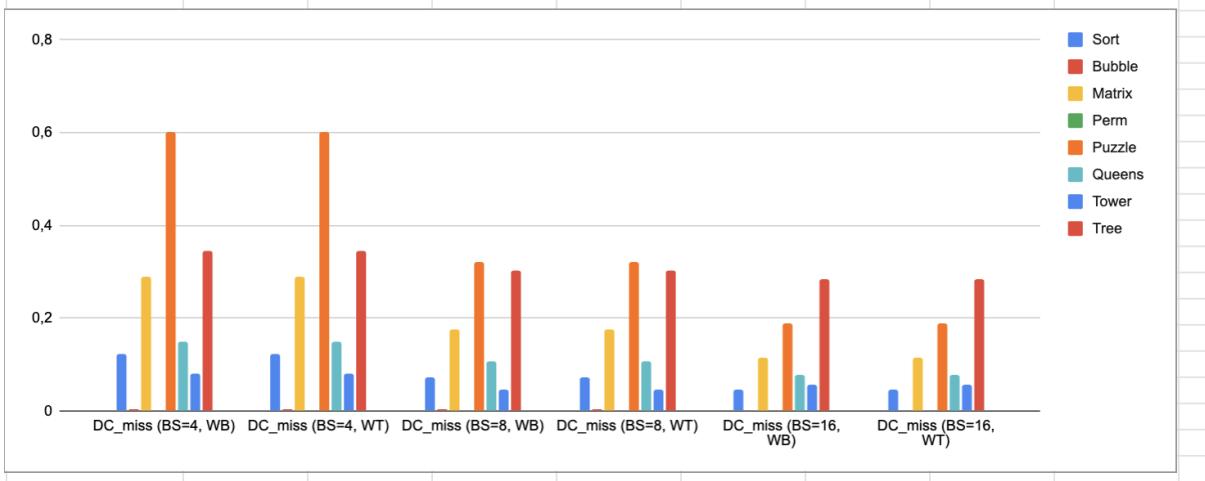


Concluzii: Daca numarul de instructiuni trimise e mai mare ( $2 \rightarrow 4$ ) se observa o crestere in Issue Rate.

	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
IR (BS = 4, WB)	0,949	1,646	0,669	1,483	0,478	0,674	0,303	0,534
IR (BS = 4, WT)	0,801	1,619	0,430	1,480	0,323	0,574	0,279	0,398
IR (BS = 8, WB)	1,062	1,647	0,858	1,483	0,619	0,742	0,315	0,569
IR (BS = 8, WT)	0,945	1,633	0,598	1,481	0,466	0,655	0,299	0,423
IR (BS = 16, WB)	1,143	1,647	1,009	1,480	0,720	0,800	0,312	0,583
IR (BS = 16, WT)	1,056	1,640	0,753	1,482	0,589	0,726	0,294	0,432



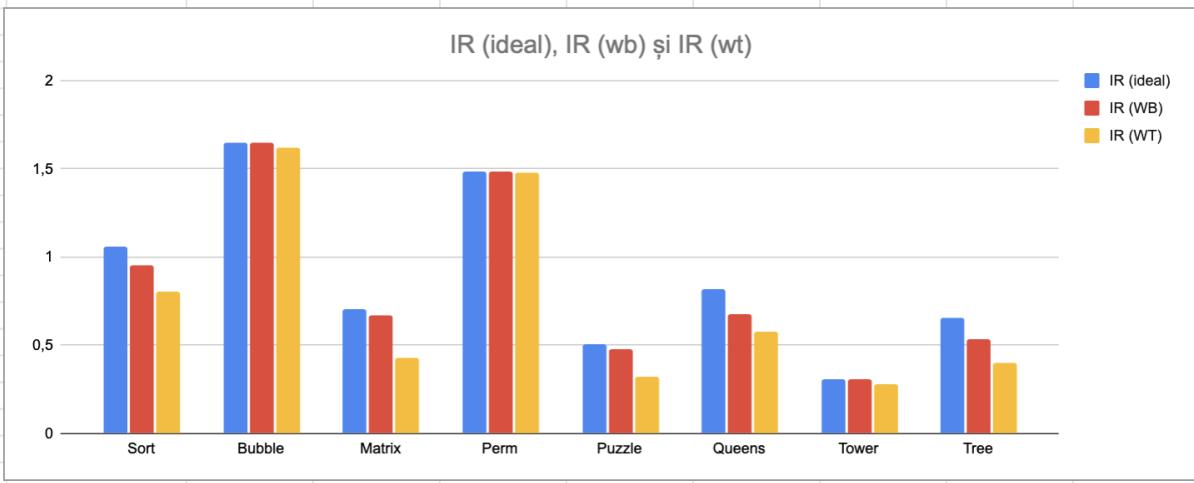
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
DC_miss (BS=4, WB)	12,10%	0,36%	28,84%	0,04%	60,21%	14,75%	7,93%	34,54%
DC_miss (BS=4, WT)	12,10%	0,36%	28,84%	0,04%	60,21%	14,75%	7,93%	34,54%
DC_miss (BS=8, WB)	7,29%	0,19%	17,39%	0,02%	32,16%	10,68%	4,63%	30,14%
DC_miss (BS=8, WT)	7,29%	0,19%	17,39%	0,02%	32,16%	10,68%	4,63%	30,14%
DC_miss (BS=16, WB)	4,46%	0,10%	11,31%	0,01%	18,81%	7,71%	5,55%	28,36%
DC_miss (BS=16, WT)	4,46%	0,10%	11,31%	0,01%	18,81%	7,71%	5,55%	28,36%



Concluzii: IR creste pe masura ce Block size ul se maresteste.

### Exercitiul 6

	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
IR (ideal)	1,058	1,648	0,705	1,483	0,505	0,818	0,308	0,651
IR (WB)	0,949	1,646	0,669	1,483	0,478	0,674	0,303	0,534
IR (WT)	0,801	1,619	0,430	1,480	0,323	0,574	0,279	0,398

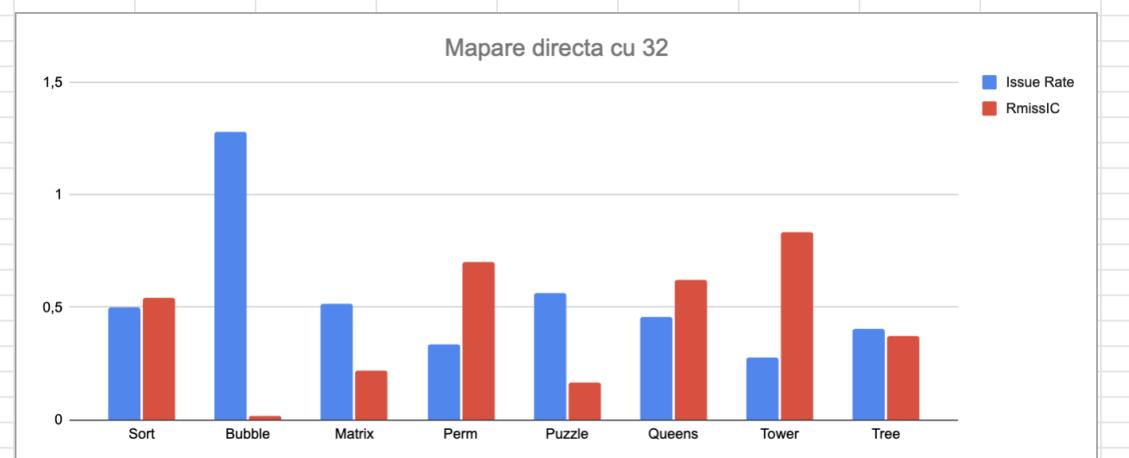


Concluzii: Varianta cu IR (Ideal) este putin mai buna, deoarece ratele de procesare sunt putin mai mari ca la WB si WT.

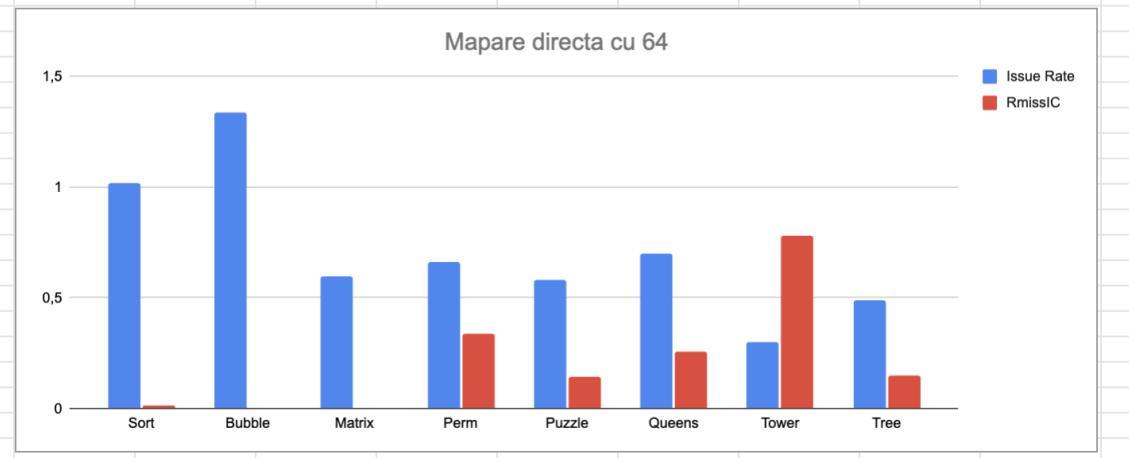
## LABORATOR 4

Exercitiul 1	
Punctul A	
<b>Sort</b>	0,4999
<b>Bubble</b>	1,2772
<b>Matrix</b>	0,5139
<b>Perm</b>	0,3375
<b>Puzzle</b>	0,5622
<b>Queens</b>	0,4553
<b>Tower</b>	0,2750
<b>Tree</b>	0,4033

	<b>Sort</b>	<b>Bubble</b>	<b>Matrix</b>	<b>Perm</b>	<b>Puzzle</b>	<b>Queens</b>	<b>Tower</b>	<b>Tree</b>
<b>Issue Rate</b>	0,4999	1,2772	0,5139	0,3375	0,5622	0,4553	0,2750	0,4033
<b>RmissIC</b>	54,31%	1,59%	21,57%	70,35%	16,58%	62,40%	83,41%	37,19%
<b>RhitIC</b>	45,69%	98,41%	78,43%	29,65%	83,42%	37,60%	16,59%	62,81%

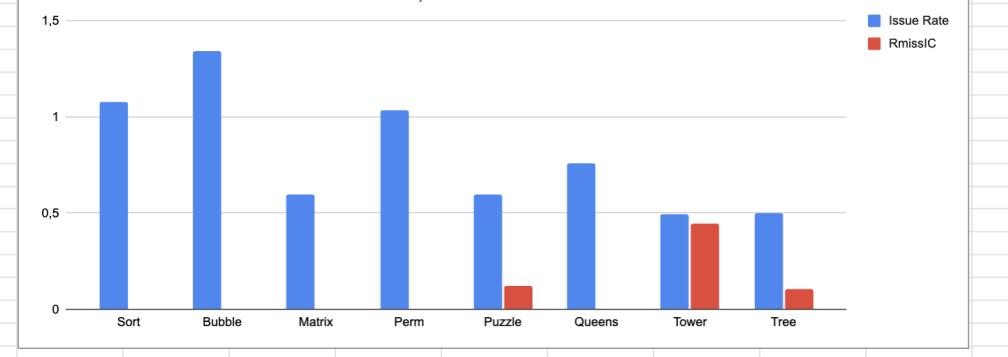


	<b>Sort</b>	<b>Bubble</b>	<b>Matrix</b>	<b>Perm</b>	<b>Puzzle</b>	<b>Queens</b>	<b>Tower</b>	<b>Tree</b>
<b>Issue Rate</b>	1,0194	1,34	0,5986	0,6595	0,5814	0,6989	0,3010	0,4893
<b>RmissIC</b>	1,58%	0,06%	0,11%	33,86%	14,41%	25,66%	78,27%	14,99%
<b>RhitIC</b>	98,42%	99,94%	99,89%	66,14%	85,59%	74,34%	21,73%	85,01%



	<b>Sort</b>	<b>Bubble</b>	<b>Matrix</b>	<b>Perm</b>	<b>Puzzle</b>	<b>Queens</b>	<b>Tower</b>	<b>Tree</b>
<b>Issue Rate</b>	1,0798	1,3407	0,5986	1,0355	0,5963	0,7580	0,4952	0,5018
<b>RmissIC</b>	0,27%	0,06%	0,09%	0,03%	11,93%	0,39%	44,44%	10,29%
<b>RhitIC</b>	99,73%	99,94%	99,91%	99,97%	88,07%	99,61%	55,56%	89,71%

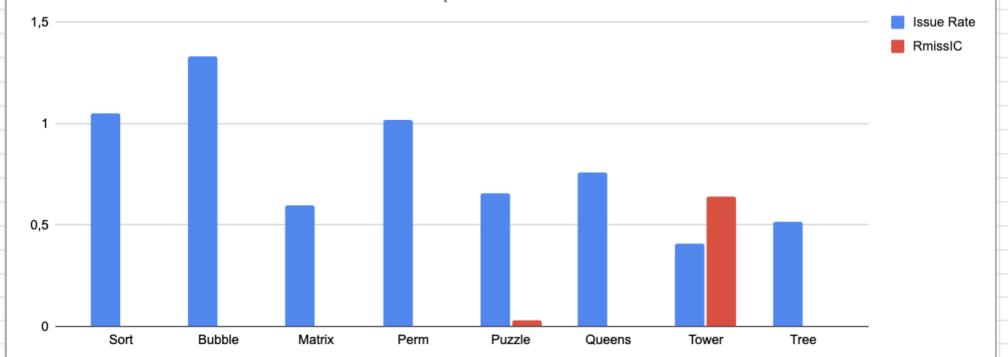
Mapare directă cu 128



#### Punctul B

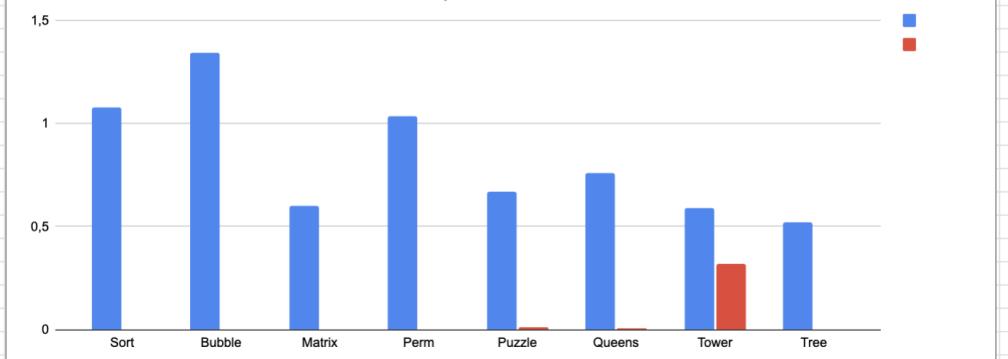
	<b>Sort</b>	<b>Bubble</b>	<b>Matrix</b>	<b>Perm</b>	<b>Puzzle</b>	<b>Queens</b>	<b>Tower</b>	<b>Tree</b>
<b>Issue Rate</b>	1,0501	1,3337	0,5952	1,0204	0,6563	0,7564	0,4096	0,5158
<b>RmissIC</b>	0,14%	0,03%	0,04%	0,02%	2,88%	0,49%	64,19%	0,06%
<b>RhitIC</b>	99,86%	99,97%	99,96%	99,98%	97,12%	99,51%	35,81%	99,94%

Simple Victim cu 32



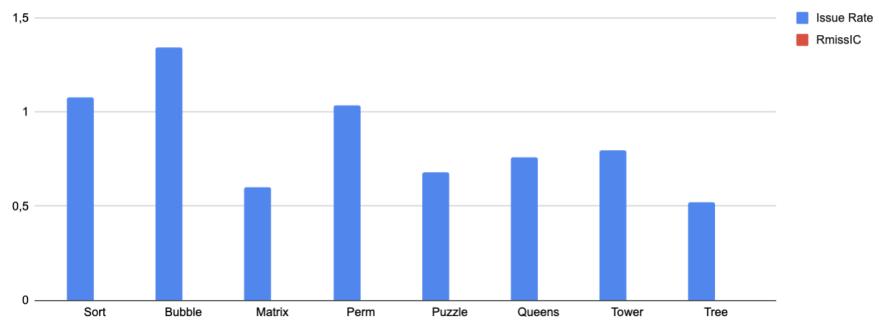
	<b>Sort</b>	<b>Bubble</b>	<b>Matrix</b>	<b>Perm</b>	<b>Puzzle</b>	<b>Queens</b>	<b>Tower</b>	<b>Tree</b>
<b>Issue Rate</b>	1,0795	1,3407	0,5987	1,0354	0,6694	0,7573	0,5914	0,5198
<b>RmissIC</b>	0,14%	0,03%	0,04%	0,02%	1,36%	0,37%	32,13%	0,06%
<b>RhitIC</b>	99,86%	99,97%	99,96%	99,98%	98,64%	99,63%	67,87%	99,94%

Simple Victim cu 64



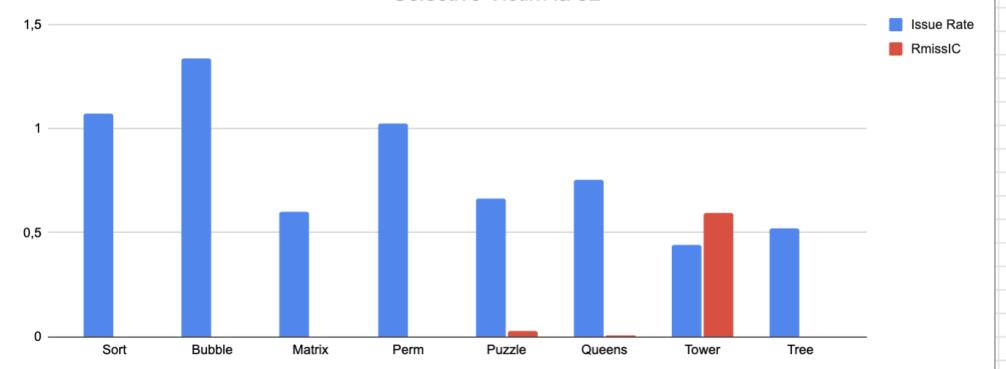
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Issue Rate	1,0802	1,3407	0,5987	1,0355	0,6786	0,7593	0,7963	0,52
RmissIC	0,12%	0,03%	0,04%	0,02%	0,04%	0,05%	0,06%	0,06%
RhitIC	99,88%	99,97%	99,96%	99,98%	99,96%	99,95%	99,94%	99,94%

Simple Victim cu 128



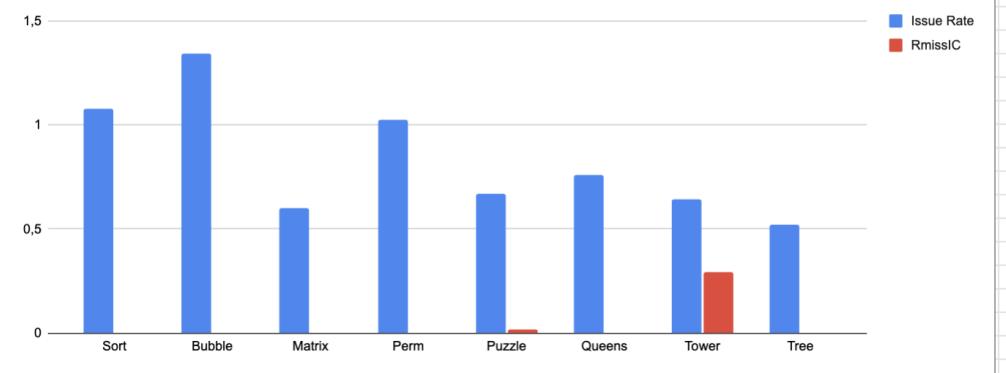
	Punctul C								
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree	
Issue Rate	1,0729	1,3388	0,5984	1,0269	0,6625	0,7565	0,4420	0,5187	
RmissIC	0,14%	0,03%	0,04%	0,02%	2,62%	0,49%	59,74%	0,07%	
RhitIC	99,86%	99,97%	99,96%	99,98%	97,38%	99,51%	40,26%	99,93%	

Selective Victim la 32



	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Issue Rate	1,0795	1,3406	0,5987	1,0269	0,6714	0,7574	0,6401	0,5199
RmissIC	0,13%	0,03%	0,04%	0,02%	1,54%	0,33%	29,46%	0,07%
RhitIC	99,87%	99,97%	99,96%	99,98%	98,46%	99,67%	70,54%	99,93%

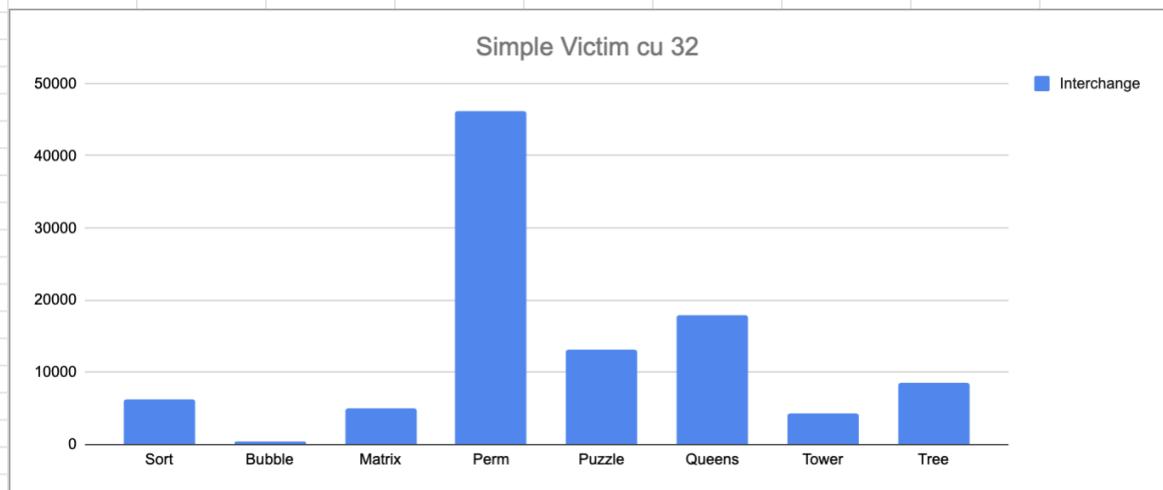
Selective Victim la 64



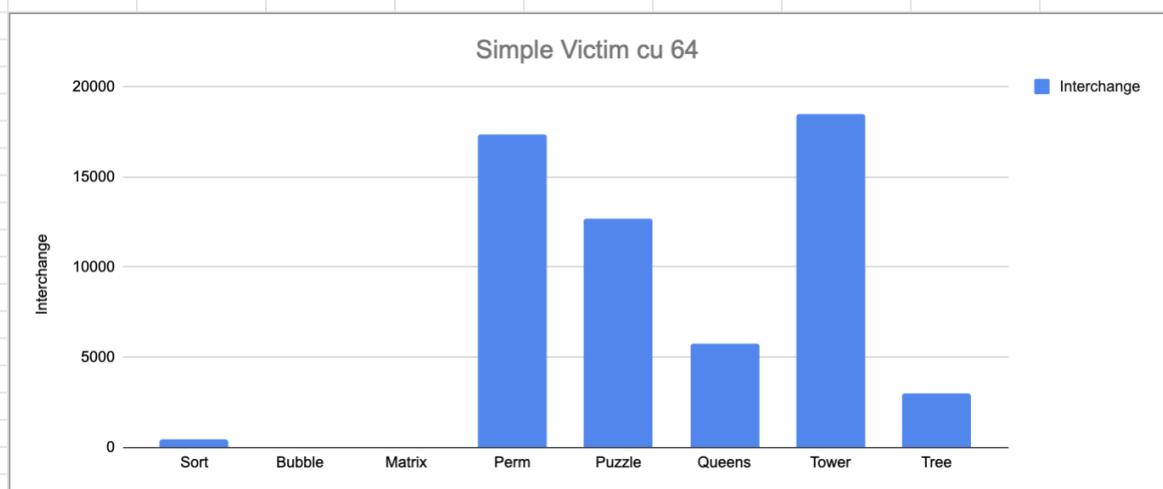
Concluzii: Rata de procesare creste cand dimensiunea memoriei de date creste, pe toate cele 3 tipuri de memorie (direct mapped, simple victim, selective victim).

Rata de miss in cache-ul de instructiuni este constanta cand dimensiunea memoriei de date creste, pe toate cele 3 tipuri de memorie (direct mapped, simple victim, selective victim).

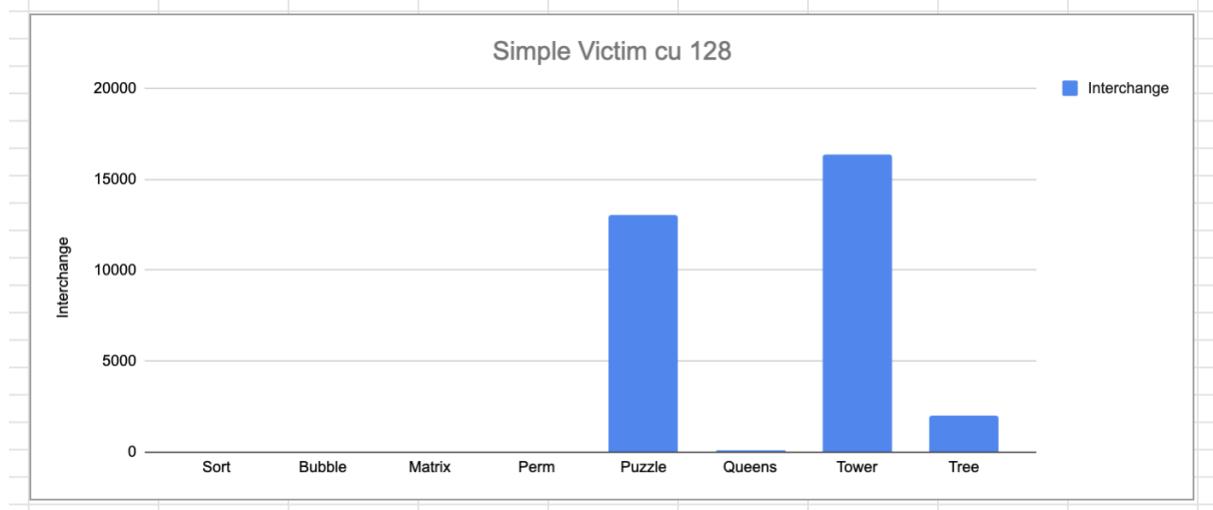
	Exercitiul 2	Punctul A						
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Interchange	6241	399	5049	46135	13.197	17971	4.224	8477



	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Interchange	459	2	5	17321	12.685	5746	18.483	2992

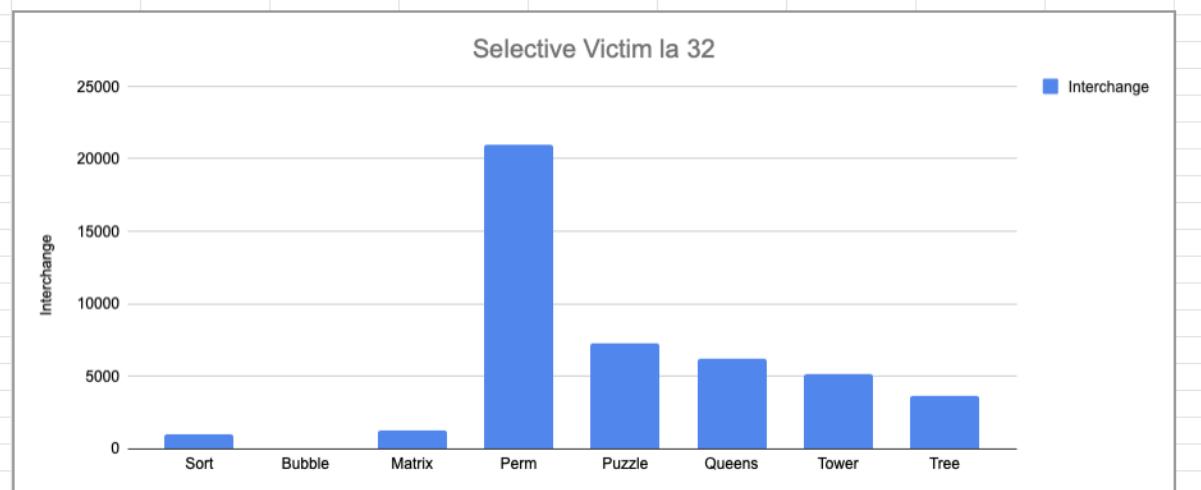


	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Interchange	2	0	2	0	12.992	56	16.374	1996

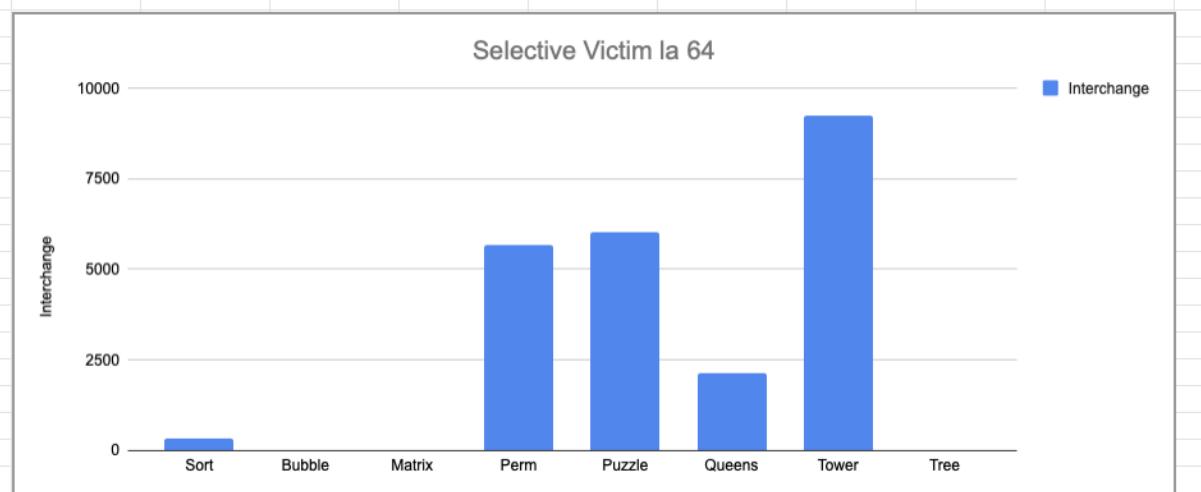


Punctul B								
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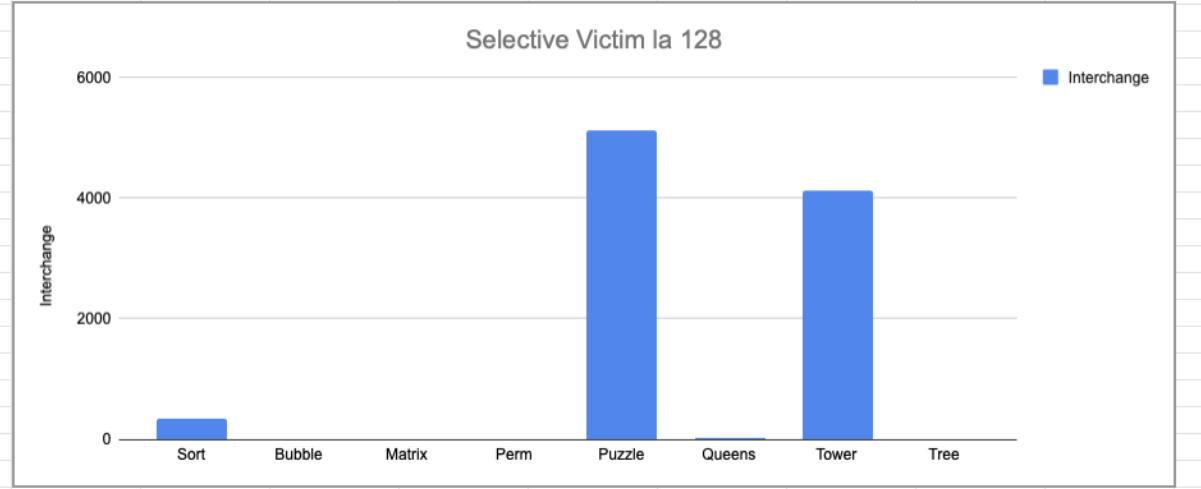
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Interchange	987	7	1256	21006	7.307	6218	5.156	3680



	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Interchange	340	9	10	5681	6.006	2137	9.222	18



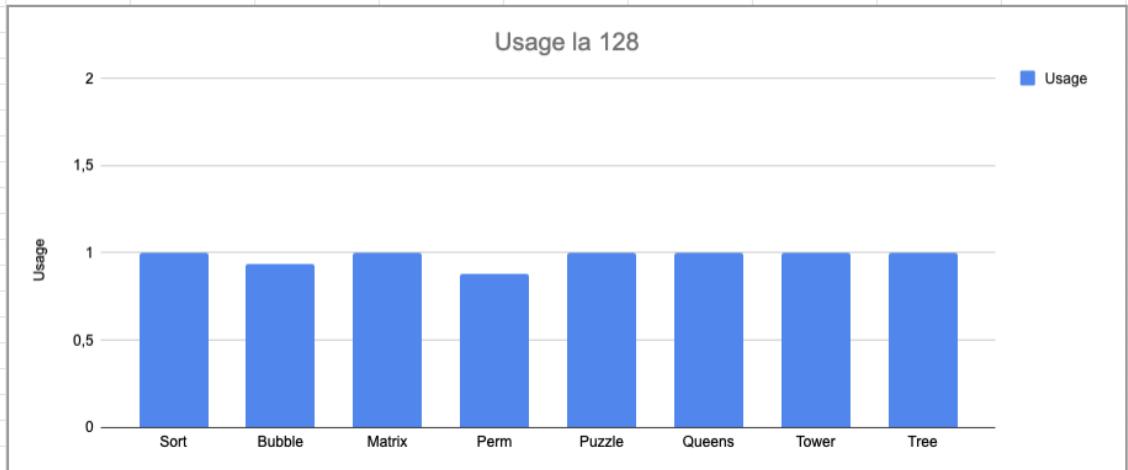
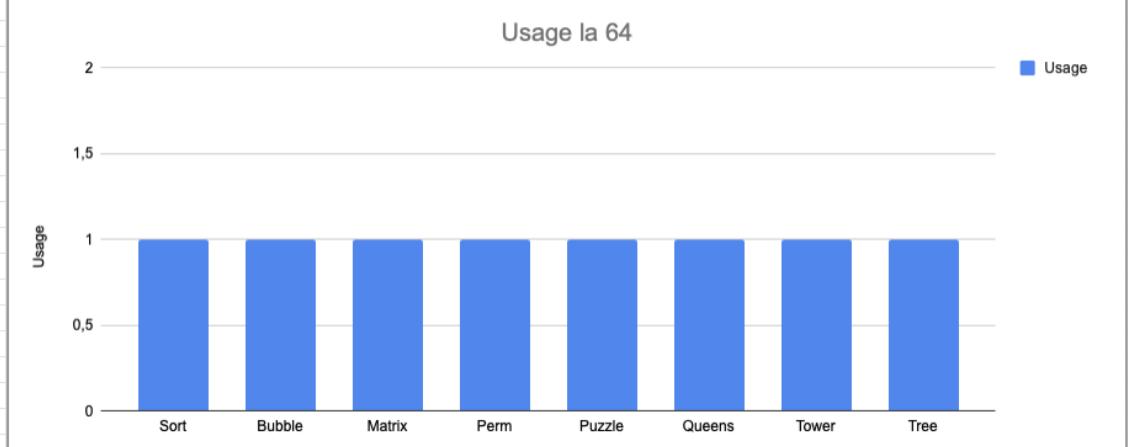
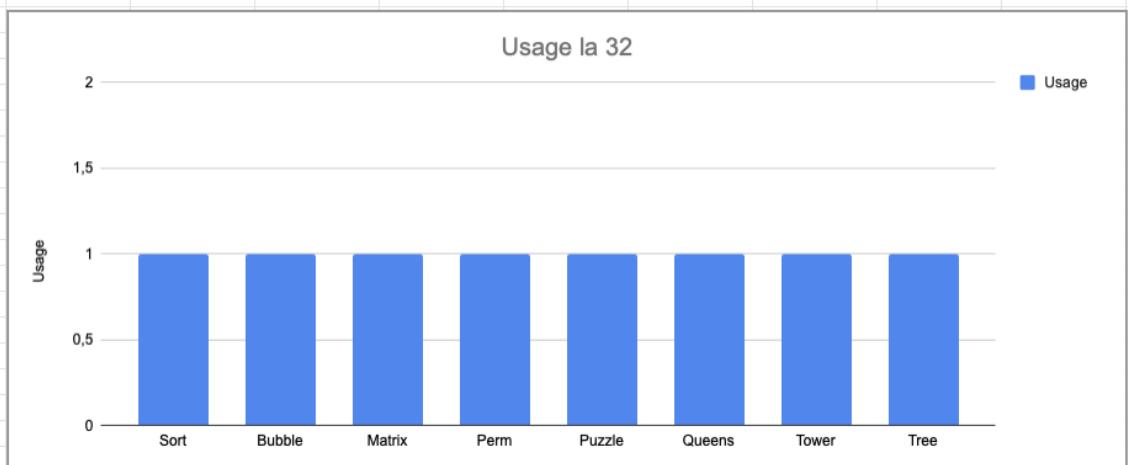
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Interchange	340	0	2	0	5.126	25	4.119	13



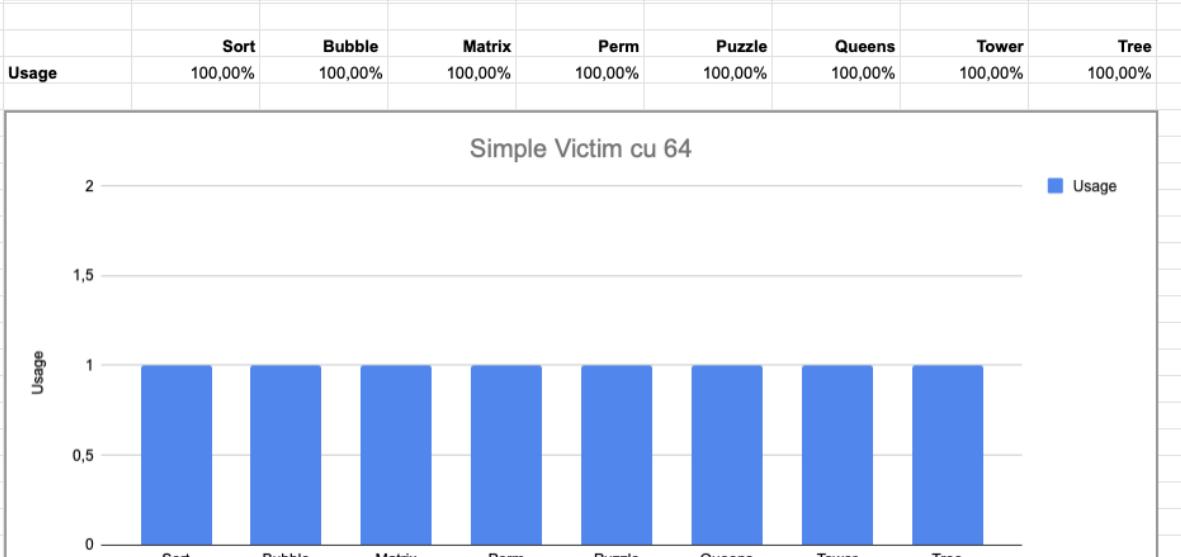
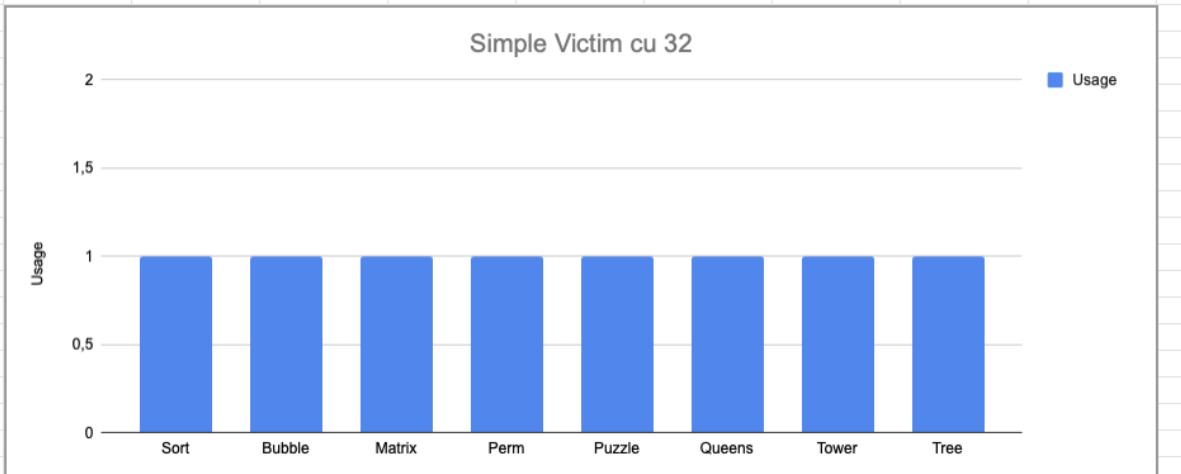
Concluzii: Datorita algoritmilor de predictie prezenti in SVC nr de interschimbari scade deoarece sunt selectate blocurile cu cea mai mare probabilitate de a fi referite in viitor sa ramana in cache celelalte ramanand in SVC.

<b>Exercitiul 3</b>								
	<b>Punctul A</b>							

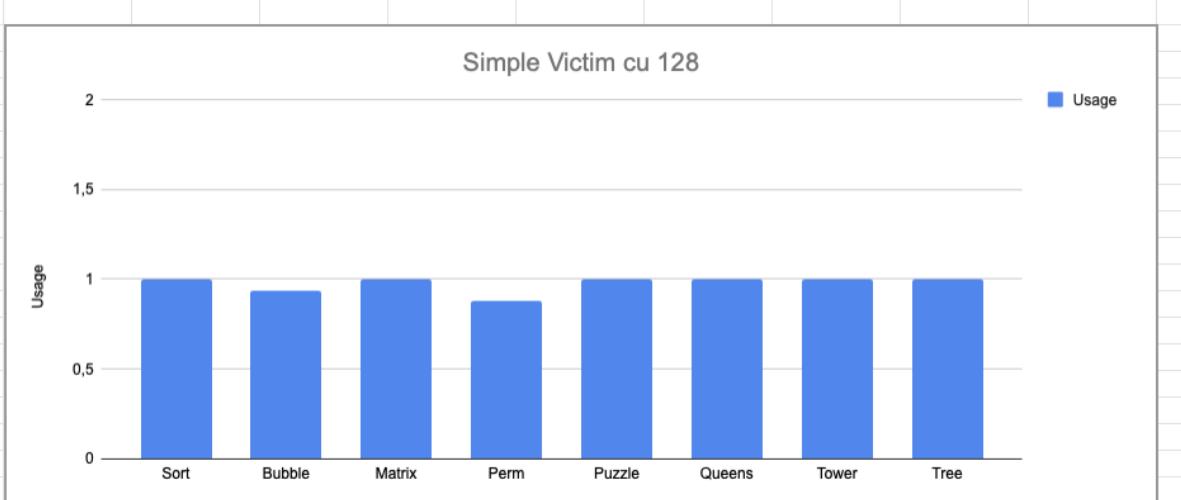
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
<b>Usage</b>	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%



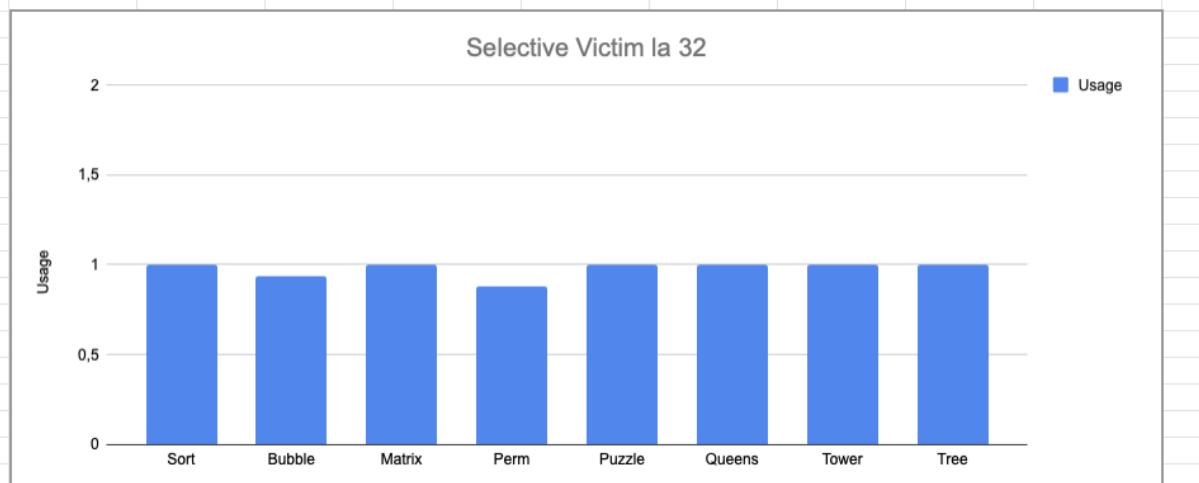
	Punctul B							
	<b>Sort</b>	<b>Bubble</b>	<b>Matrix</b>	<b>Perm</b>	<b>Puzzle</b>	<b>Queens</b>	<b>Tower</b>	<b>Tree</b>
<b>Usage</b>	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%



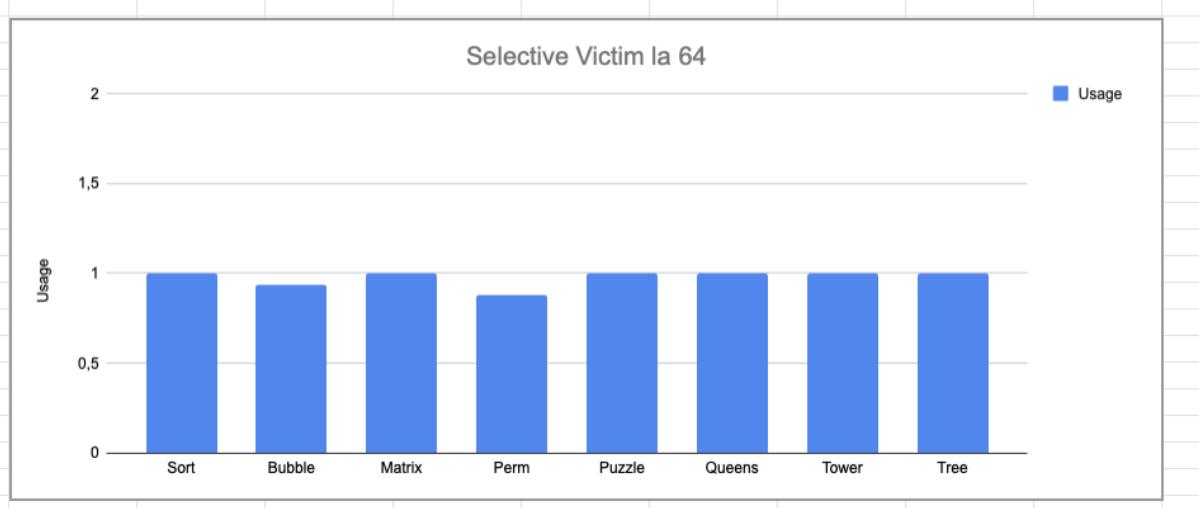
	<b>Sort</b>	<b>Bubble</b>	<b>Matrix</b>	<b>Perm</b>	<b>Puzzle</b>	<b>Queens</b>	<b>Tower</b>	<b>Tree</b>
<b>Usage</b>	100,00%	93,75%	100,00%	87,50%	100,00%	100,00%	100,00%	100,00%



Punctul C								
	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Usage	100,00%	93,75%	100,00%	87,50%	100,00%	100,00%	100,00%	100,00%



	Sort	Bubble	Matrix	Perm	Puzzle	Queens	Tower	Tree
Usage	100,00%	93,75%	100,00%	87,50%	100,00%	100,00%	100,00%	100,00%

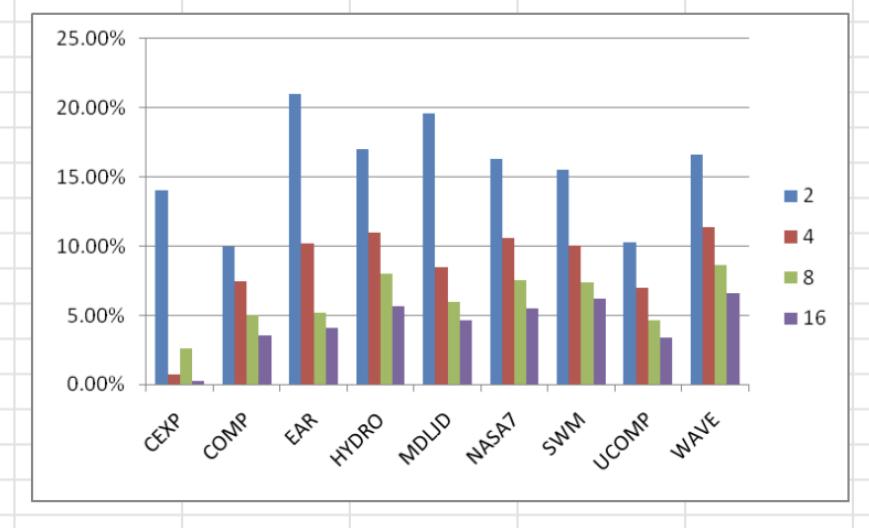


Concluzii: Dimensiunea victim cache-ului de instructiuni (simple victim cache) nu influenteaza rata de procesare, aceasta fiind constanta pe anumite trc-uri. Rata de miss tinde spre zero.

## LABORATOR 5

EX 1

Cache size	2	4	8	16
CEXP	14.05%	0.7%	2.58%	0.21%
COMP	9.94%	7.44%	5.03%	3.56%
EAR	21.04%	10.21%	5.14%	4.1%
HYDRO	16.97%	11%	8.03%	5.68%
MDLJD	19.56%	8.46%	5.94%	4.59%
NASA7	16.28%	10.56%	7.49%	5.5%
SWM	15.53%	10%	7.38%	6.22%
UCOMP	10.24%	6.98%	4.64%	3.4%
WAVE	16.6%	11.4%	8.63%	6.62%



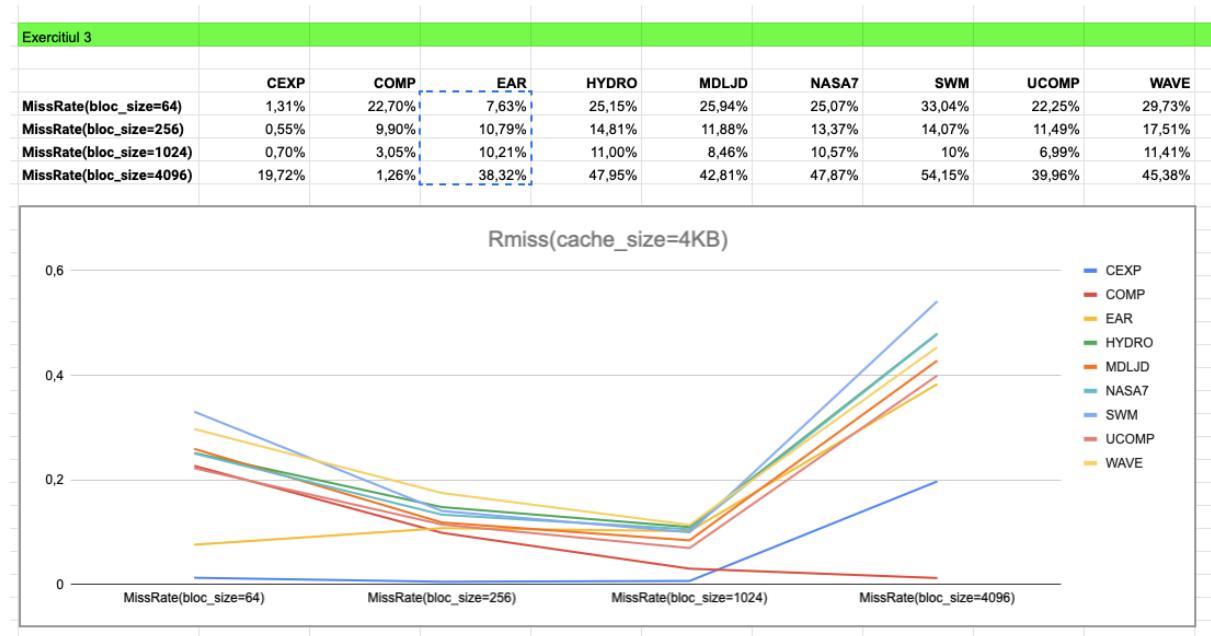
Concluzii: Cu cât creștem dimensiunea cache-ului rata de miss va scădea. De la capacitatea cacheului=4 se va face și WB, iar rata de miss rămâne aproximativ constantă.

	CEXP	COMP	EAR	HYDRO	MDLJD	NASA7	SWM	UCOMP	WAVE
MissRate(8)	3,81%	33,51%	43,50%	53,97%	41,32%	47,87%	52,00%	34,61%	43,80%
MissRate(16)	4,14%	36,13%	44,23%	58,11%	43,64%	57,25%	55,35%	36,15%	51,42%
MissRate(32)	4,22%	37,87%	44,93%	62,05%	44,82%	58,60%	57,37%	37,94%	55,97%
MissRate(64)	1,31%	22,70%	26,92%	25,15%	25,94%	25,07%	33,04%	22,25%	29,73%

Rmiss(block\_size)

MissRate	CEXP	COMP	EAR	HYDRO	MDLJD	NASA7	SWM	UCOMP	WAVE
MissRate(8)	0.03	0.34	0.43	0.54	0.41	0.36	0.52	0.34	0.43
MissRate(16)	0.04	0.36	0.44	0.57	0.43	0.37	0.55	0.37	0.51
MissRate(32)	0.04	0.38	0.45	0.60	0.45	0.39	0.57	0.38	0.55
MissRate(64)	0.01	0.23	0.26	0.26	0.24	0.25	0.32	0.21	0.30

Concluzii: Dacă creștem dimensiunea blocului din cache rata de miss scade până la un anumit nivel. De la bloc size=16 deși vom crește dimensiunea blocului rezultatele vor fi același adică rata de miss nu va mai scădea.



Concluzii: Pentru unele banchmark-uri cresterea bolc\_size este benefica dar pentru celelalte va creste rata de miss.

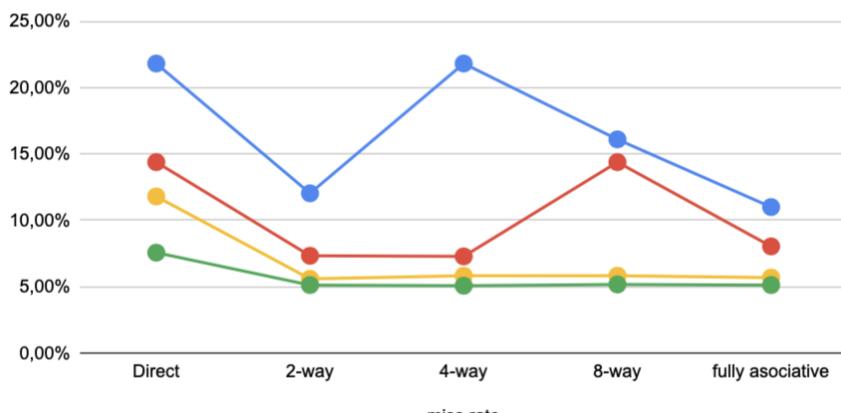
#### EX 4

Hydro

miss rate	4kb	8kb	16kb	32kb
Direct	21,82%	14,39%	11,80%	7,57%
2-way	12,04%	7,33%	5,59%	5,12%
4-way	21,82%	7,29%	5,83%	5,08%
8-way	16,10%	14,39%	5,83%	5,17%
fully associative	11,00%	8,04%	5,69%	5,12%

4kb, 8kb, 16kb și 32kb

● 4kb ● 8kb ● 16kb ● 32kb



Concluzii: Cele mai reale rezultate pentru orice dimensiune sunt produse de cache-ul direct. Indiferent de gradul de asociativitate, cele mai bune rezultate se obțin folosind cache-uri cu dimensiuni mai mari sau egale cu 8KB.

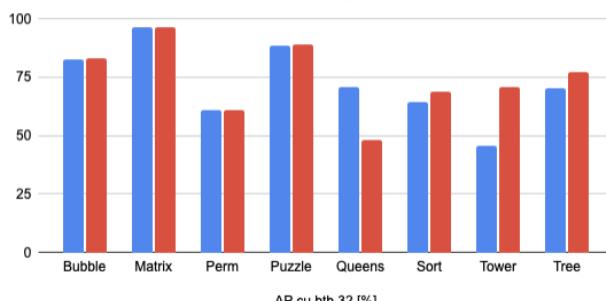
## LABORATOR 6

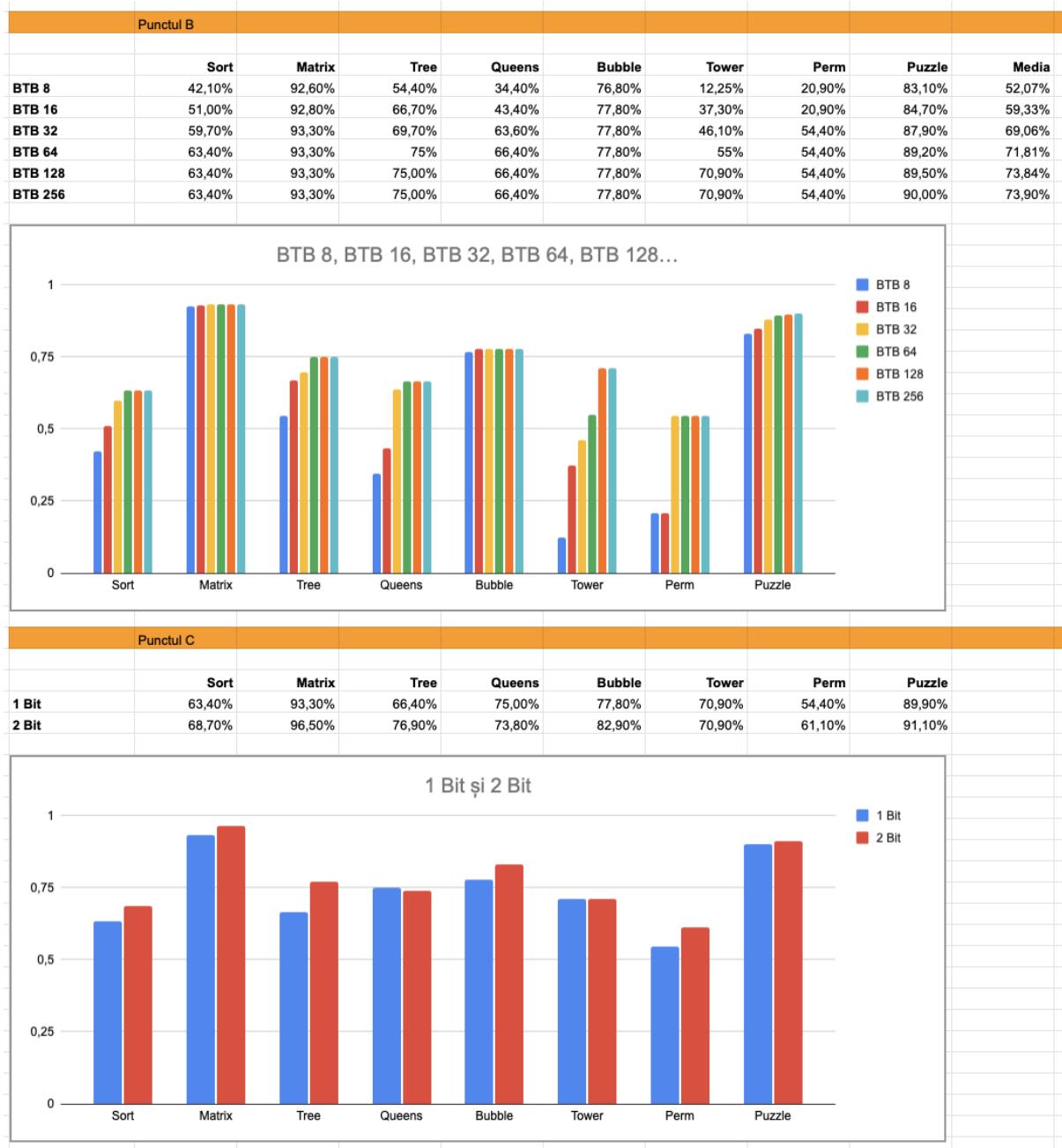
#### Ex 1 punctul a

AP cu btb 32 [%]	Bubble	Matrix	Perm	Puzzle	Queens	Sort	Tower	Tree	Average
Mapat	82,4	96,5	61,1	88,5	70,5	64,1	45,4	70,1	72,325
Complet Asoc	82,9	96,5	61,1	88,9	48,2	68,7	70,9	76,9	74,2625

Mapat și Complet Asoc

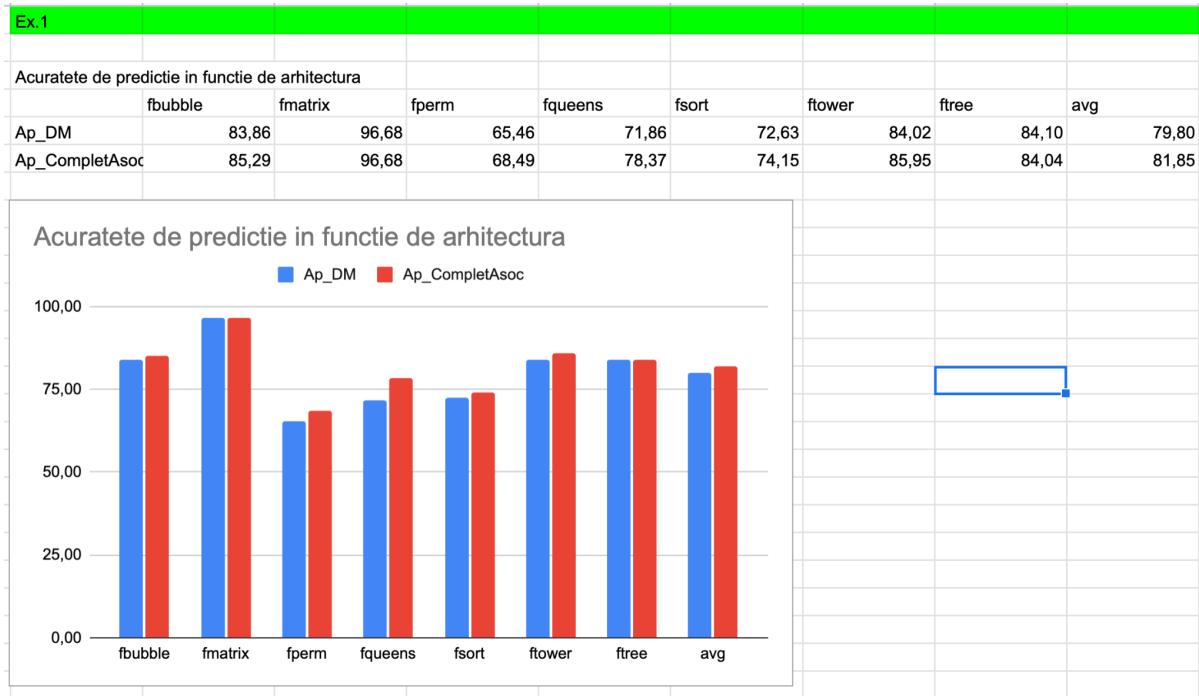
● Mapat ● Complet Asoc



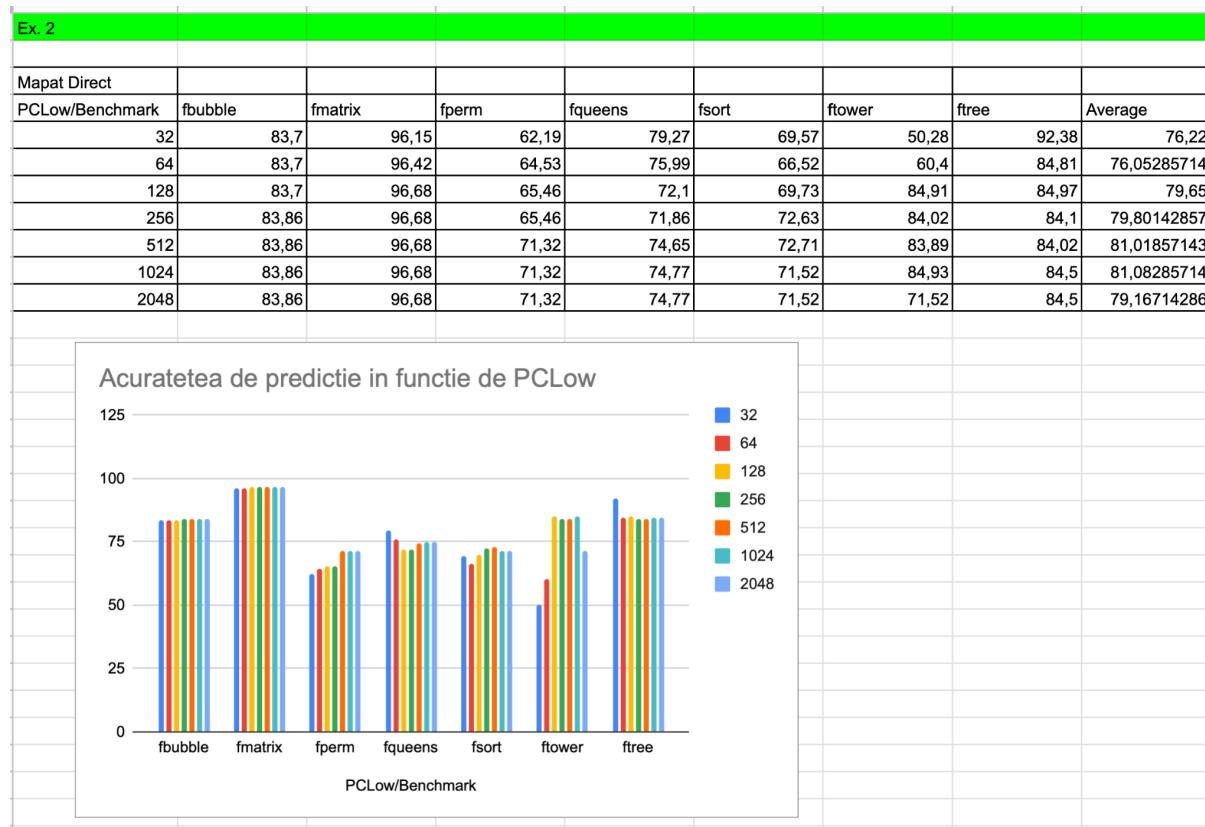


**Concluzii:** Din simularile realizate se observă ca predictia este mai corectă în cazul folosirii unei tabele complet associative. De asemenea, din b) și c) se observă faptul că acuratețea predictiei crește odată cu incrementarea dimensiunii tabelelor de predicție, dar doar până la dimensiunea de 64 biți.

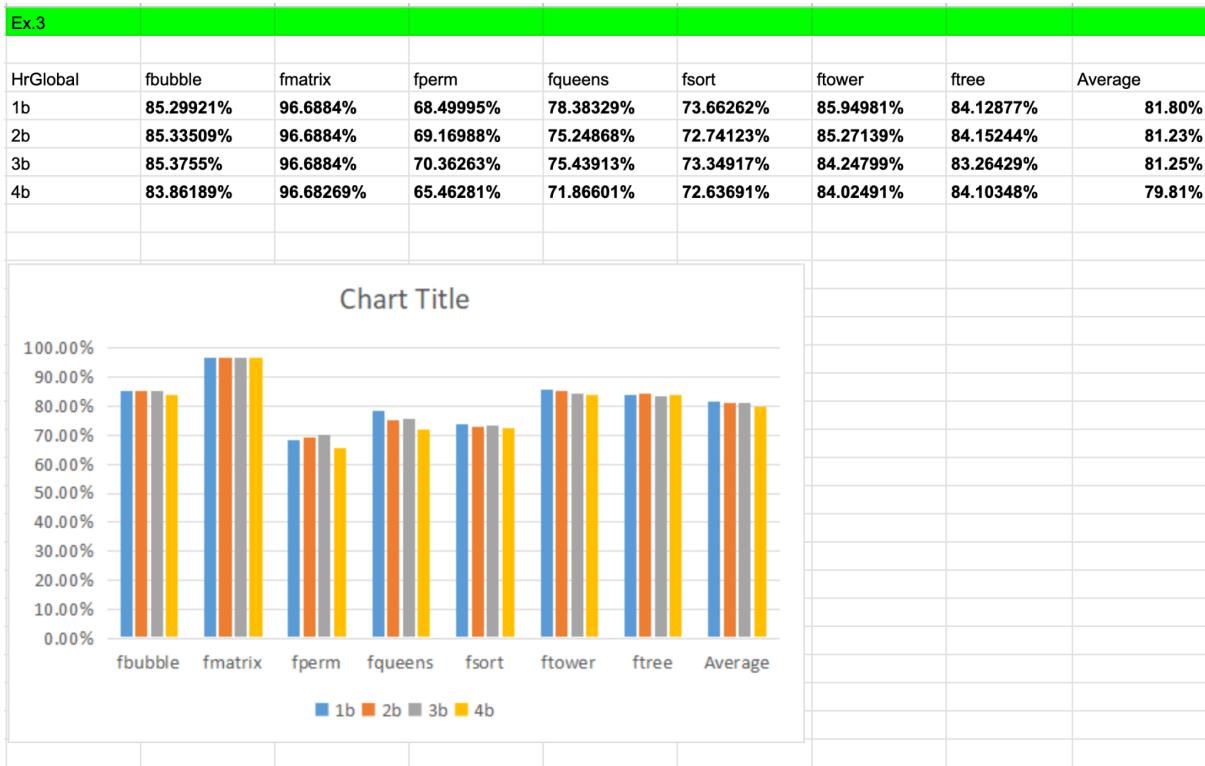
## LABORATOR 7



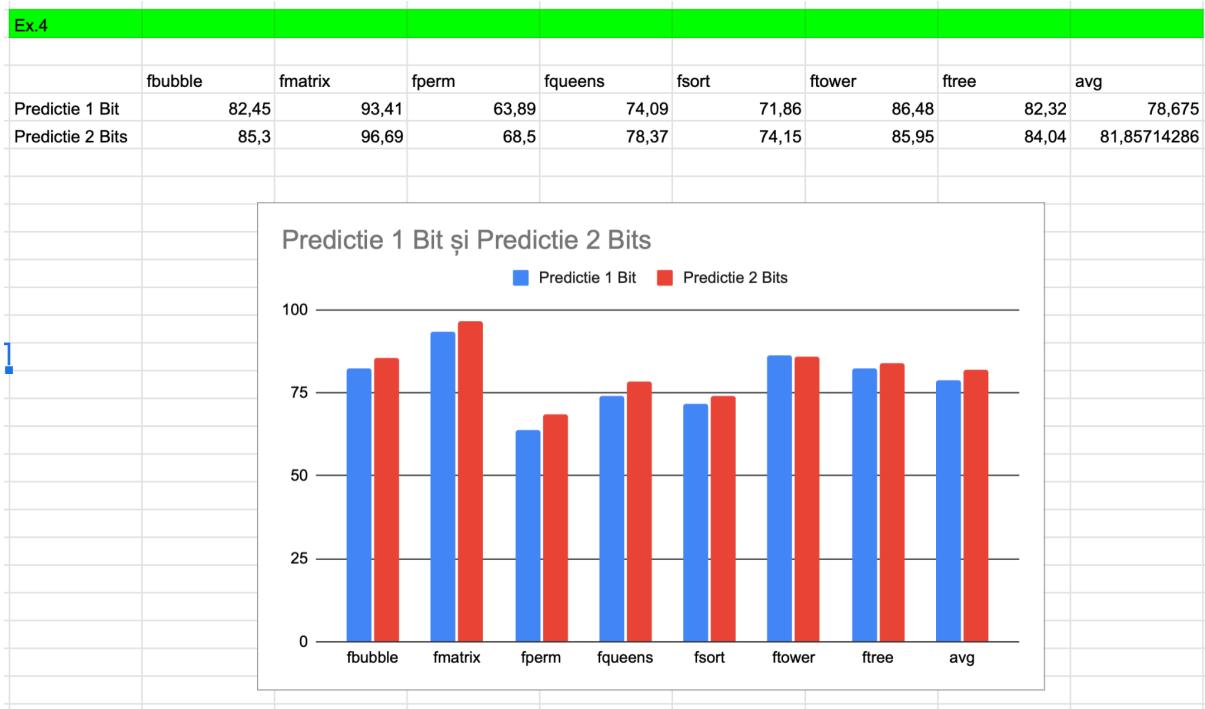
Concluzii: Predictia în cazul maparii complet asociative este mai buna.



Concluzii: Pentru benchmark-urile FBUBBLE, FMATRIX, FTREE , diferențele de PCLow sunt extrem de mici sau nu există.



Concluzii: Pentru toate banchmark-urile mediile sunt foarte apropriate.

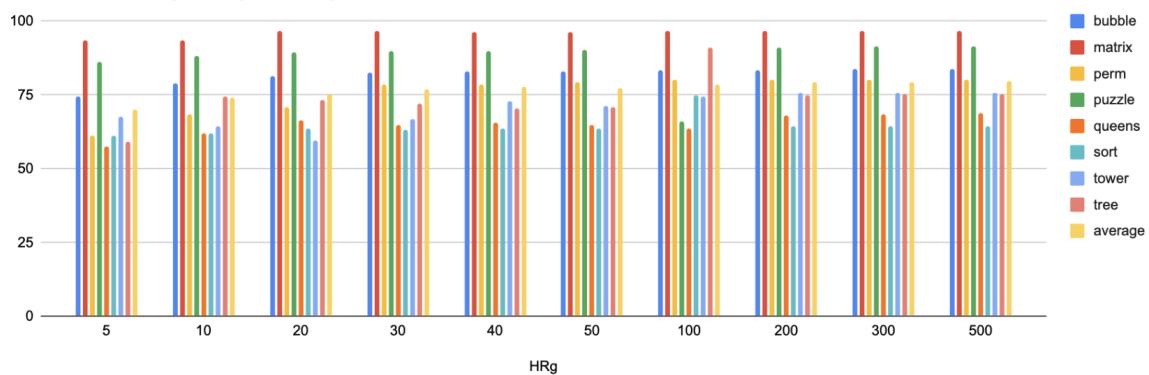


Concluzii: Daca avem un automat de predictie pe 2 biti, nr salturilor predictionate in mod corect creste.

## LABORATORUL 8

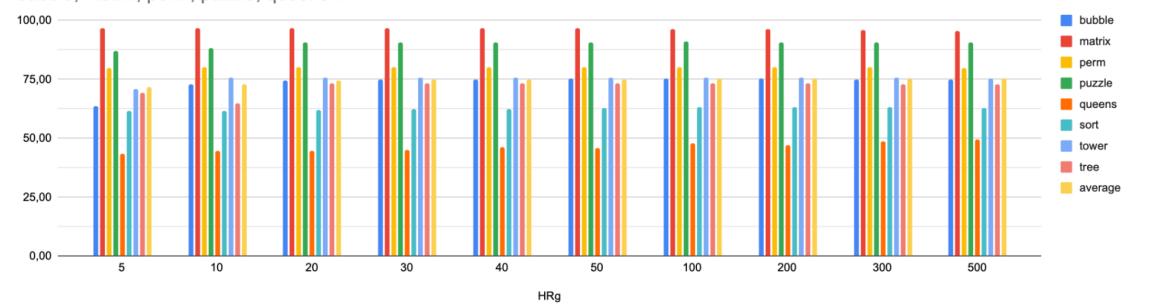
Ex. 1									
HRg	bubble	matrix	perm	puzzle	queens	sort	tower	tree	average
5	74,44	93,39	61,32	86,31	57,74	61,27	67,48	59,06	70,12625
10	79,16	93,33	68,3	88,05	62,03	61,87	64,59	74,39	73,965
20	81,4	96,56	70,73	89,59	66,35	63,58	59,51	73,27	75,12375
30	82,56	96,56	78,38	89,67	64,66	63,36	66,88	72,21	76,785
40	83,04	96,45	78,68	90,06	65,45	63,43	72,89	70,49	77,56125
50	82,93	96,45	79,38	90,46	65,01	63,75	71,34	70,68	77,5
100	83,21	96,66	80,17	66,1	63,8	74,74	74,43	90,89	78,75
200	83,21	96,68	80,17	91,15	68,04	64,55	75,85	75,01	79,3325
300	83,66	96,69	80,17	91,46	68,44	64,52	75,85	75,17	79,495
500	83,69	96,69	80,17	91,61	68,96	64,55	75,85	75,32	79,605

bubble, matrix, perm, puzzle, queens...



Ex. 2									
HRg	bubble	matrix	perm	puzzle	queens	sort	tower	tree	average
5	63,55	96,68	79,70	87,20	43,51	61,59	70,68	69,15	71,51
10	72,84	96,67	80,14	88,31	44,73	61,60	75,85	64,64	73,10
20	74,60	96,65	80,16	90,51	44,49	61,89	75,84	73,28	74,68
30	74,94	96,63	80,16	90,70	44,84	62,58	75,82	73,34	74,88
40	74,99	96,60	80,16	90,74	46,19	62,33	75,81	73,42	75,03
50	75,19	96,58	80,15	90,77	45,76	62,62	75,81	73,40	75,04
100	75,24	96,46	80,12	90,88	47,67	63,12	75,76	73,33	75,32
200	75,15	96,23	80,05	90,86	47,23	63,29	75,69	73,18	75,21
300	75,03	96,00	79,98	90,84	48,60	63,33	75,58	73,03	75,30
500	74,79	95,54	79,84	90,79	49,32	62,99	75,40	72,73	75,18

bubble, matrix, perm, puzzle, queens...



Concluzii: Se observa ca odata cu cresterea istoriei globale nivelul de predictie creste, iar PPM complet are un nivel mai mare de predictie decat cel simplificat.

## LABORATORUL 9

Exercitiu 1										
Hidden Layer	HRG	fbubble	fmatrix	fperm	fpuzzle	fqueens	fsort	ftower	ftree	Average
15	2	85,47%	96,71%	88,61%	95,23%	79,64%	76,35%	96,97%	89,35%	88,54%
	4	85,43%	96,71%	92,85%	95,60%	81,55%	76,23%	97,01%	89,76%	89,39%
	6	86,15%	96,71%	95,06%	95,49%	81,27%	74,73%	96,84%	89,52%	89,47%
	8	86,25%	96,71%	94,90%	95,39%	82,08% X	82,21% X	96,43%	89,68%	91,63%
	10	86,16%	96,71%	94,62%	95,57%	82,80%	82,21% X	96,87%	89,66%	91,69%
	2	85,46%	96,70%	89,44%	95,32%	80,00%	76,46%	96,78%	89,48%	88,71%
30	4	85,63%	96,70%	93,14%	95,69%	81,61%	76,18%	96,89%	89,73%	89,45%
	6	85,71%	96,70%	95,04%	95,79%	82,59%	76,11%	96,88%	89,70%	89,82%
	8	86,32%	96,70%	94,23%	95,86%	82,80%	76,17%	96,60%	89,90%	89,82%
	10	86,21%	96,70%	94,28%	95,86%	83,90% X	83,90% X	96,58%	90,08%	91,94%
	2	85,65%	96,69%	88,65%	95,26%	79,93%	75,84%	96,76%	89,40%	88,52%
	4	85,50%	96,70%	92,35%	95,63%	82,02%	76,18%	97,03%	89,75%	89,40%
50	6	85,69%	96,70%	95,02%	95,75%	82,58%	76,81%	96,82%	89,70%	89,88%
	8	86,41%	96,70%	94,35%	95,85%	82,43%	75,42%	96,62%	90,02%	89,73%
	10	86,41%	96,70%	94,16%	95,86%	82,91% X	82,91% X	96,51%	89,94%	91,78%

Concluzii: Pe masura ce cresc datele in retea, procesul dureaza din ce in ce mai mult.

Exercitiu 2										
Hidden Layer = 15										
HRG	Learning Step	fbubble	fmatrix	fperm	fpuzzle	fqueens	fsort	ftower	ftree	Average
0	0,125	85,23%	96,71%	90,25%	94,04%	80,37%	73,21%	95,55%	89,56%	88,12%
1	0,25	85,39%	96,71%	89,91%	95,22%	79,94%	72,35%	96,74%	89,59%	88,23%
2	0,375	85,68%	96,71%	88,43%	95,29%	80,45%	76,34%	96,80%	89,70%	88,68%
3	0,5	85,68%	96,71%	89,11%	95,47%	81,73%	77,55%	97,03%	89,74%	89,13%
4	0,625	85,88%	96,71%	92,96%	95,70%	81,42%	76,44%	97,05%	89,91%	89,51%
5	0,75	85,96%	96,71%	93,28%	95,76%	81,37%	77,50%	97,01%	89,71%	89,66%
6	0,875	86,27%	96,71%	95,36%	95,71%	81,33%	75,34%	95,82%	89,44%	89,50%
7	1	86,11%	96,71%	94,86%	95,40%	81,62% X		96,05%	89,18%	91,42%
8	1,125	86,23%	96,71%	94,26%	95,63%	82,14%	77,11%	96,74%	90,10%	89,87%
9	1,25	86,25%	96,71%	94,12%	95,50%	82,09% X		96,15%	89,02%	91,41%
10	1,375	86,58%	96,71%	94,83%	95,18%	81,92% X		97,05%	89,69%	91,71%

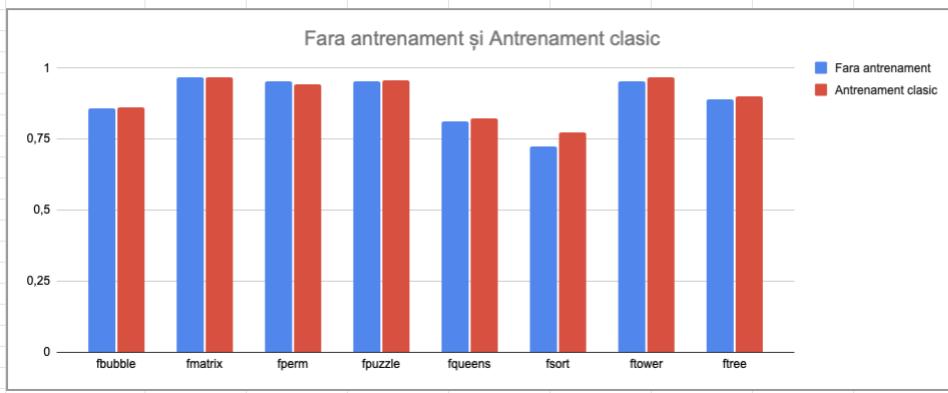
### Exercitiu3

Observatii: Am luat date cu valori corecte (fara X)

Hidden Layer = 15

Learning Step = 1,125

	fbubble	fmatrix	fperm	fpuzzle	fqueens	fsort	ftower	ftree	Average
Fara antrenament	85,85%	96,70%	95,20%	95,32%	81,12%	72,19%	95,18%	88,83%	88,80%
Antrenament clasic	86,23%	96,71%	94,26%	95,63%	82,14%	77,11%	96,74%	90,10%	89,87%

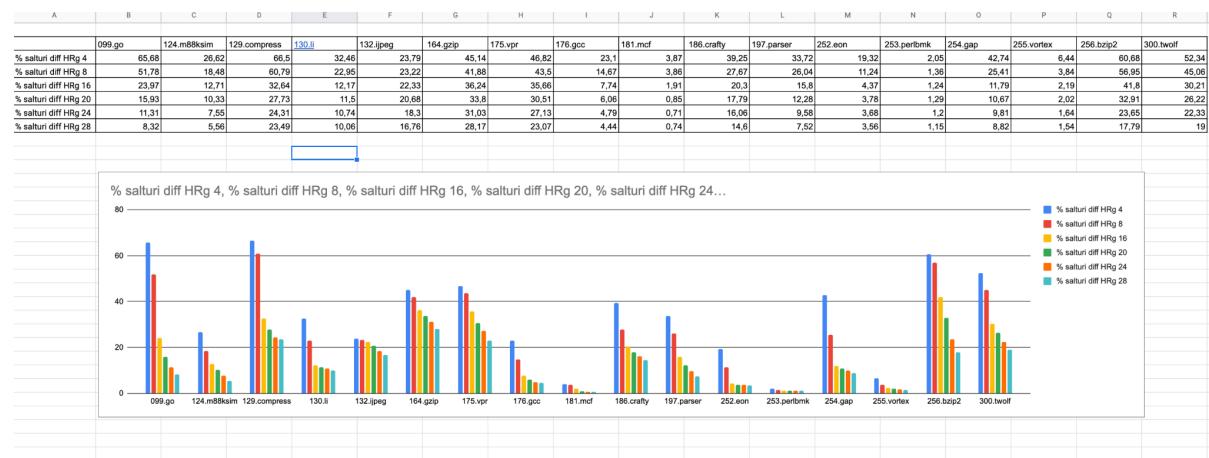


General 4

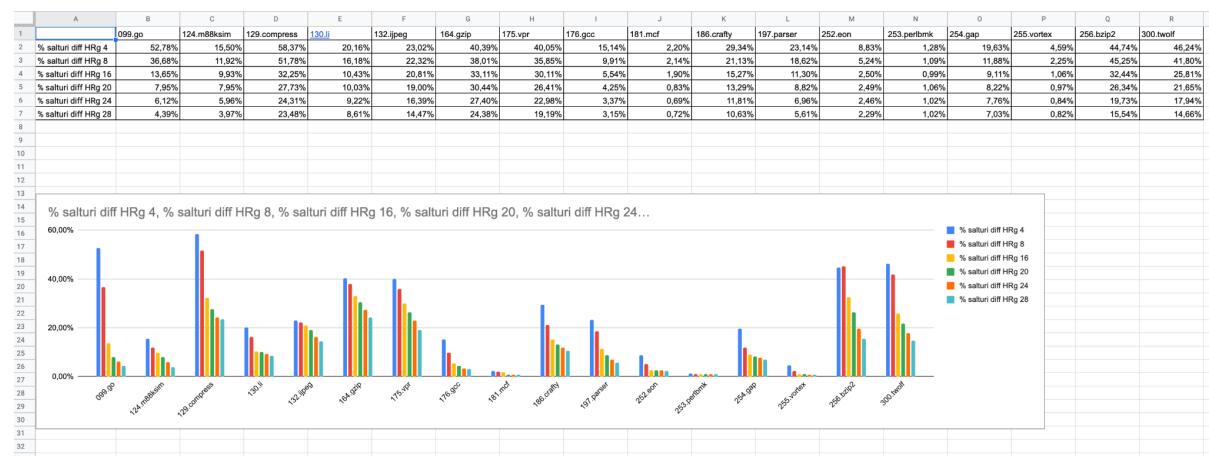
HRG	Filter	Bubble	fmatrix	fperm	fpuzzle	fqueens	fshort	frower	ftree	Average
2	60.00%	85.53%	99.71%	89.45%	95.39%	80.04%	75.83%	96.66%	89.49%	85.46%
	70.00%	85.61%	99.71%	89.45%	95.37%	80.05%	76.83%	96.66%	89.33%	86.87%
	80.00%	85.71%	99.71%	89.45%	95.35%	80.06%	76.83%	96.66%	89.23%	87.95%
	90.00%	85.61%	99.71%	89.45%	95.34%	79.03%	75.92%	96.66%	89.32%	88.53%
	95.00%	85.61%	99.71%	89.45%	95.33%	79.03%	75.92%	96.66%	89.34%	89.18%
4	60.00%	85.55%	99.71%	93.13%	95.86%	81.47%	76.32%	96.85%	89.73%	86.17%
	70.00%	85.57%	99.71%	93.13%	95.86%	81.47%	76.32%	96.85%	89.75%	86.36%
	80.00%	85.70%	99.71%	93.39%	95.86%	81.49%	75.91%	96.85%	89.86%	86.93%
	90.00%	85.70%	99.71%	93.39%	95.84%	81.42%	75.94%	96.85%	89.57%	89.39%
	95.00%	85.76%	99.71%	93.39%	95.83%	81.48%	74.79%	96.84%	89.53%	89.91%
6	60.00%	85.02%	99.71%	95.37%	96.82%	81.93%	76.92%	96.77%	89.91%	86.99%
	70.00%	85.02%	99.71%	95.37%	96.82%	81.93%	76.92%	96.77%	89.91%	87.45%
	80.00%	85.08%	99.71%	94.91%	95.85%	82.02%	77.12%	96.77%	89.80%	88.76%
	90.00%	85.65%	99.71%	95.32%	95.82%	82.10%	75.77%	96.77%	89.70%	89.76%
	95.00%	85.64%	99.71%	95.32%	95.81%	82.07%	76.07%	96.77%	89.63%	89.53%
8	60.00%	86.23%	99.71%	94.85%	95.86%	82.14%	X	96.85%	90.07%	87.76%
	70.00%	86.45%	99.71%	94.43%	95.87%	82.02%	76.49%	96.52%	89.87%	87.80%
	80.00%	86.12%	99.71%	94.80%	95.82%	81.76%	75.87%	96.52%	89.94%	88.80%
	90.00%	86.53%	99.71%	94.06%	95.82%	82.00%	75.76%	96.51%	89.89%	88.85%
	95.00%	86.52%	99.71%	94.06%	95.83%	82.00%	74.93%	96.51%	89.92%	89.72%
10	60.00%	86.23%	99.71%	94.23%	95.67%	83.55%	X	96.59%	90.01%	87.87%
	70.00%	86.38%	99.71%	94.19%	95.77%	82.82%	X	96.59%	89.91%	89.05%
	80.00%	86.65%	99.71%	94.99%	95.65%	82.88%	X	96.60%	90.04%	90.40%
	90.00%	86.74%	99.71%	94.93%	95.64%	83.04%	X	96.60%	89.99%	90.24%
	95.00%	85.23%	99.71%	95.28%	95.82%	83.07%	X	96.60%	90.00%	92.22%

# **LABORATORUL 10**

EX.1



EX.2



Concluzii: Se poate observa ca istoria locală ajută la predicierea salturilor greu de prezis deoarece ia în considerare și saltul curent.