Alejandro Rubio Martínez

lscpu	
CPU(s):	6
Model name:	Intel(R) Core(TM) i5-9600K CPU @ 3.70GHz
Virtualization:	VT-x
L3 cache:	9 MiB

POPCOUNT

```
for i in 0 g 1 2; do
    printf "__OPTIM%1c__%48s\n" $i "" | tr " " "="
    rm  popcount
    gcc popcount.c -o popcount -O$i -D TEST=0 -w
    for j in $(seq 0 10); do
        echo $j; ./popcount
    done | pr -11 -l 22 -w 80
done

Ignorar medición 0, repetir columna si alguna medición se sale demasiado de la media
```

Optimización -O0

	0	1	2	3	4	5	6	7	8	9	10	media
popcount1 (lenguaje C - for)	66648	59365	57982	58129	58351	58321	58141	58141	58376	58638	58512	58396
popcount2 (lenguaje C - while)	36100	34061	39920	40135	34541	31502	34833	33491	30542	36302	30449	34578
popcount3 (leng.ASM-body while 4i)	13704	11189	8738	8563	8687	8623	8655	8574	8714	8629	8670	8904,2
popcount4 (leng.ASM-body while 3i)	15233	10768	9783	9564	9608	9699	9599	9665	9695	9585	9602	9756,8
popcount5 (CS:APP2e 3.49-group 8b)	15477	15240	15395	15195	15397	15418	15315	15366	15345	15241	15204	15312
popcount6 (Wikipedia- naive - 32b)	6036	5897	5965	5861	6036	5894	5903	5900	5944	5868	5904	5917,2
popcount7 (Wikipedia- naive -128b)	3321	3279	3293	3268	3393	3271	3212	3215	3262	3229	3247	3266,9
popcount8 (asm SSE3 - pshufb 128b)	586	581	572	573	623	585	653	576	579	575	578	589,5
popcount9 (asm SSE4- popcount 32b)	1967	1939	1980	1973	2091	1953	1988	1947	1973	1940	1978	1976,2
popcount10(asm SSE4- popcount128b)	612	624	587	583	646	599	644	628	583	591	584	606,9

Optimización -Og

	0	1	2	3	4	5	6	7	8	9	10	media
popcount1 (lenguaje C - for)	17577	16271	15961	16192	16194	16088	16134	16113	16078	16032	16114	16118
popcount2 (lenguaje C - while)	7891	6408	6343	7057	6404	6375	6358	6369	6369	6347	6370	6440
popcount3 (leng.ASM-body while 4i)	10417	7878	7784	7827	7826	7877	7886	7868	7882	7879	7818	7852,5
popcount4 (leng.ASM-body while 3i)	9400	7376	7324	7333	7357	7340	7385	7359	7336	7356	7333	7349,9
popcount5 (CS:APP2e 3.49-group 8b)	5257	5126	5101	5164	5076	5064	5066	5070	5039	5065	5062	5083,3
popcount6 (Wikipedia- naive - 32b)	2918	2917	2918	2903	2918	2919	2917	2912	2912	2883	2913	2911,2
popcount7 (Wikipedia- naive -128b)	1253	1223	1212	1227	1212	1208	1245	1245	1248	1266	1278	1236,4
popcount8 (asm SSE3 - pshufb 128b)	310	302	307	313	306	341	306	312	315	313	317	313,2
popcount9 (asm SSE4- popcount 32b)	354	355	357	396	370	367	369	360	361	361	363	365,9
popcount10(asm SSE4- popcount128b)	242	240	243	244	257	250	256	243	242	243	245	246,3

Optimización -O1

	0	1	2	3	4	5	6	7	8	9	10	media
popcount1 (lenguaje C - for)	9998	10066	10042	10025	10067	9884	11727	10133	10380	10462	10916	10370
popcount2 (lenguaje C - while)	9617	9718	9674	9632	9661	9597	9673	9988	9685	9721	9689	9703,8
popcount3 (leng.ASM-body while 4i)	9066	7787	7804	7721	7770	7805	7802	7803	7841	7801	7843	7797,7
popcount4 (leng.ASM-body while 3i)	9615	9594	9628	9591	9678	9592	9549	9573	9655	9664	9697	9622,1
popcount5 (CS:APP2e 3.49-group 8b)	3740	3720	3626	3521	3755	3717	3439	3450	3792	3755	3626	3640,1
popcount6 (Wikipedia- naive - 32b)	1936	1887	1915	1928	1842	1845	1850	1892	1860	1849	1894	1876,2
popcount7 (Wikipedia- naive -128b)	1057	1031	1067	1042	1031	1032	1041	1066	1068	1081	1050	1050,9
popcount8 (asm SSE3 - pshufb 128b)	324	303	320	311	298	297	307	311	341	312	310	311
popcount9 (asm SSE4- popcount 32b)	370	410	356	357	351	354	360	400	367	368	360	368,3
popcount10(asm SSE4- popcount128b)	272	252	241	242	240	240	246	251	243	250	243	244,8

Optimización -O2

	0	1	2	3	4	5	6	7	8	9	10	media
popcount1 (lenguaje C - for)	10041	10674	11002	9963	10070	10014	9941	10676	10253	10716	10748	10406
popcount2 (lenguaje C - while)	6170	7719	6137	9253	6125	6124	6134	6082	6037	8388	8341	7034
popcount3 (leng.ASM-body while 4i)	238	241	239	239	239	238	239	239	239	278	252	244,3
popcount4 (leng.ASM-body while 3i)	7410	8834	7300	7974	7410	7413	7767	11056	8683	9830	7285	8355,2
popcount5 (CS:APP2e 3.49-group 8b)	5297	5305	5320	5356	5294	5382	5299	5364	5457	5296	5257	5333
popcount6 (Wikipedia- naive - 32b)	1948	1916	1885	1878	1872	1897	1908	1921	1948	1921	1931	1907,7
popcount7 (Wikipedia- naive -128b)	988	1045	982	980	971	1040	976	985	1012	976	986	995,3
popcount8 (asm SSE3 - pshufb 128b)	313	313	301	300	300	327	300	302	337	303	315	309,8
popcount9 (asm SSE4- popcount 32b)	364	364	399	358	380	362	359	359	368	359	362	367
popcount10(asm SSE4- popcount128b)	241	244	241	241	286	242	267	242	251	243	246	250,3

POPCOUNT:	-O0	-Og	-O1	-O2
pcnt1	58396	16118	**10370**	10406
pcnt2	34578	**6440**	9704	7034
pcnt3	8904	7853	**7798**	244
pcnt4	9757	7350	**9622**	8355
pcnt5	15312	5083	3640	**5333**
pcnt6	5917	2911	1876	**1908**
pcnt7	3267	1236	1051	**995**
pcnt8	590	313	311	**310**
pcnt9	1976	366	368	**367**
pcnt10	607	**246**	245	**250**

Ganancias:	-O0	-Og	-O1	-O2
pcnt1			1,00	
pcnt2		1,61		
pcnt3			1,33	
pcnt4			1,08	
pcnt5				1,94
pcnt6				5,44
pcnt7				10,42
pcnt8				33,47
pcnt9				28,26
pcnt10		42,10	42,36	41,43

bucles for/while

sumas en árbol

repertorio multimedia