

# analyze\_ndistinguished\_points

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```
[1]: import pandas as pd
import numpy as np
from IPython.display import display
pd.set_option('display.max_rows', None)
pd.set_option('display.max_columns', None)
```

Compare the number of distinguished points before the golden values are found between three methods. 1. Normal program execution 2. Cheating: skip inputs that leads to the golden output but are not the golden inputs 3. Stop as soon as we see both of the golden inputs, and their respective chains use f and g correctly (i.e. goldA let us use f, goldB let us use g)

## 1 When difficulty = 0

```
[2]: # Normal Program execution
df_normal = pd.read_csv("claw_summary.csv.normal_diff0.csv")

C_max_size = 3 # maximum size of the number of bytes in the output

for c in range(1, C_max_size):
    # Filter the DataFrame where C_size is equal to 1
    filtered_df = df_normal[df_normal['C_size'] == c]

    # Calculate the mean of the desired column (e.g., 'Column1')
    mean_value = filtered_df["#distinguished_points_log2"].mean()
    print(f"#distinguished_points required is on avg. 2^{mean_value:.03f} pts, \u2192when |C| = {8*c:02} bits")

print(f"\nNote: avg. is the geometric mean")
filtered_df = df_normal[df_normal['C_size'] == c]
```

#distinguished\_points required is on avg.  $2^{14.337}$  pts, when  $|C| = 08$  bits

#distinguished\_points required is on avg.  $2^{22.097}$  pts, when  $|C| = 16$  bits

Note: avg. is the geometric mean

```
[3]: # Filtered bad collisions that might kick the golden inputs from dict

df_skip = pd.read_csv("claw_summary.csv.stop_on_witnessing_diff0.csv")

C_max_size = 3 # maximum size of the number of bytes in the output

for c in range(1, C_max_size):
    # Filter the DataFrame where C_size is equal to 1
    filtered_df = df_skip[df_skip['C_size'] == c]

    # Calculate the mean of the desired column (e.g., 'Column1')
    mean_value = filtered_df["#distinguished_points_log2"].mean()
    print(f"#distinguihsed_points required is on avg. 2^{mean_value:.03f} pts,␣
    ↪when |C| = {8*c:02} bits")

print(f"\nNote: avg. is the geometric mean")
```

#distinguihsed\_points required is on avg.  $2^{11.234}$  pts, when  $|C| = 08$  bits  
 #distinguihsed\_points required is on avg.  $2^{19.191}$  pts, when  $|C| = 16$  bits

Note: avg. is the geometric mean

## 2 Difficulty is not fixed to zero (incomplete)

```
[4]: # Data collected when running the code noramlly, we pretend we dont' know the␣
    ↪golden inputs

df_orig = pd.read_csv("claw_summary.csv.old.csv")

log2_n_dist_pts = np.log2(df_orig["#distinguished_points"])
col_name = "#distinguished_points"
df_orig[f'{col_name}_log2'] = np.log2(df_orig['#distinguished_points'])
# Reorder the columns
cols = list(df_orig.columns)
cols = cols[:5] + [f'{col_name}_log2'] + cols[5:-1] # Move the new column to␣
    ↪the sixth position
df_orig = df_orig[cols]
```

```
[5]: # Data collected in the case that we stop as soon we as see both of the golden␣
    ↪inputs
# during the expected chains, i.e., golden_inputA invokes f, golden_inputB␣
    ↪invokes g
# Recall: We made these inputs live in C, so we have to choose between f or g␣
    ↪each
#         time.
```

```

df_witness = pd.read_csv("claw_summary.csv.stop_on_witnessing.csv")

log2_n_dist_pts = np.log2(df_witness["#distinguished_points"])
col_name = "#distinguished_points"
df_witness[f'{col_name}_log2'] = np.log2(df_witness['#distinguished_points'])
# Reorder the columns
cols = list(df_witness.columns)
cols = cols[:5] + [f'{col_name}_log2'] + cols[5:-1] # Move the new column to
↳the sixth position
df_witness = df_witness[cols]

```

```
[6]: display(df_orig)
```

	C_size	A_size	B_size	difficulty	#distinguished_points \
claw	1	1	1	0	42573
claw	1	1	1	0	22582
claw	1	1	1	0	22888
claw	1	1	1	0	25924
claw	1	1	1	0	4153
claw	1	1	1	0	30370
claw	1	1	1	0	39269
claw	1	1	1	0	61891
claw	1	1	1	0	233745
claw	1	1	1	0	2041
claw	1	1	1	0	72882
claw	1	1	1	0	50559
claw	1	1	1	0	18529
claw	1	1	1	0	11022
claw	1	1	1	0	44494
claw	1	1	1	0	39734
claw	1	1	1	0	4641
claw	1	1	1	0	21168
claw	1	1	1	0	8735
claw	1	1	1	0	46433
claw	1	1	1	0	132325
claw	1	1	1	0	15862
claw	1	1	1	0	32880
claw	1	1	1	0	7867
claw	1	1	1	0	46812
claw	1	1	1	0	19899
claw	1	1	1	0	3818
claw	1	1	1	0	8113
claw	1	1	1	0	51724
claw	1	1	1	0	73287
claw	1	1	1	1	14363

claw	1	1	1	1	26983
claw	1	1	1	1	40564
claw	1	1	1	1	27917
claw	1	1	1	1	111361
claw	1	1	1	1	34545
claw	1	1	1	1	37490
claw	1	1	1	1	42757
claw	1	1	1	1	33092
claw	1	1	1	1	3910
claw	1	1	1	1	9714
claw	1	1	1	1	40133
claw	1	1	1	1	24677
claw	1	1	1	1	18653
claw	1	1	1	1	23249
claw	1	1	1	1	11040
claw	1	1	1	1	12625
claw	1	1	1	1	86573
claw	1	1	1	1	126324
claw	1	1	1	1	35073
claw	1	1	1	1	16649
claw	1	1	1	1	4940
claw	1	1	1	1	427088
claw	1	1	1	1	51429
claw	1	1	1	1	27606
claw	1	1	1	1	4198
claw	1	1	1	1	50948
claw	1	1	1	1	14587
claw	1	1	1	1	20346
claw	1	1	1	1	87344
claw	1	1	1	2	98752
claw	1	1	1	2	59053
claw	1	1	1	2	3086
claw	1	1	1	2	16195
claw	1	1	1	2	45794
claw	1	1	1	2	3679
claw	1	1	1	2	3256
claw	1	1	1	2	107
claw	1	1	1	2	20109
claw	1	1	1	2	20901
claw	1	1	1	2	935
claw	1	1	1	2	5476
claw	1	1	1	2	17480
claw	1	1	1	2	7386
claw	1	1	1	2	21066
claw	1	1	1	2	34435
claw	1	1	1	2	11338
claw	1	1	1	2	12479
claw	1	1	1	2	60285

claw	1	1	1	2	15709
claw	1	1	1	2	4712
claw	1	1	1	2	26760
claw	1	1	1	2	30220
claw	1	1	1	2	3114
claw	1	1	1	2	59167
claw	1	1	1	2	34988
claw	1	1	1	2	9176
claw	1	1	1	2	22024
claw	1	1	1	2	8195
claw	1	1	1	2	43070
claw	1	1	1	3	36257
claw	1	1	1	3	20406
claw	1	1	1	3	59732
claw	1	1	1	3	9426
claw	1	1	1	3	20435
claw	1	1	1	3	67828
claw	1	1	1	3	60750
claw	1	1	1	3	9274
claw	1	1	1	3	104174
claw	1	1	1	3	15282
claw	1	1	1	3	29914
claw	1	1	1	3	30193
claw	1	1	1	3	75274
claw	1	1	1	3	12085
claw	1	1	1	3	14086
claw	1	1	1	3	68896
claw	1	1	1	3	170397
claw	1	1	1	3	25645
claw	1	1	1	3	33194
claw	1	1	1	3	72453
claw	1	1	1	3	34577
claw	1	1	1	3	11959
claw	1	1	1	3	77281
claw	1	1	1	3	34334
claw	1	1	1	3	44808
claw	1	1	1	3	1805
claw	1	1	1	3	40910
claw	1	1	1	3	41840
claw	1	1	1	3	73473
claw	1	1	1	3	121727
claw	2	2	2	0	1214267
claw	2	2	2	0	4580383
claw	2	2	2	0	485492
claw	2	2	2	0	17290892
claw	2	2	2	0	16657050
claw	2	2	2	0	23073759
claw	1	1	1	2	5265

	#distinguished_points_log2	#collisions	#updates	time(sec)
claw	15.377651	19218	141	0.093384
claw	14.462886	10290	75	0.049122
claw	14.482304	10272	76	0.049282
claw	14.662001	11561	86	0.056072
claw	12.019938	1922	13	0.008971
claw	14.890359	13821	101	0.065735
claw	15.261103	17986	130	0.085503
claw	15.917442	28197	206	0.134430
claw	17.834576	105010	779	0.505236
claw	10.995060	903	6	0.004188
claw	16.153275	33276	242	0.158833
claw	15.625680	23067	168	0.108404
claw	14.177497	8459	61	0.040297
claw	13.428098	5049	36	0.023869
claw	15.441323	20094	148	0.096444
claw	15.278086	17960	132	0.086020
claw	12.180220	2078	15	0.009957
claw	14.369597	9756	70	0.046440
claw	13.092592	3895	29	0.018916
claw	15.502863	21345	154	0.100921
claw	17.013726	60104	441	0.287045
claw	13.953287	7329	52	0.034590
claw	15.004923	15103	109	0.071560
claw	12.941598	3660	26	0.017207
claw	15.514591	21114	156	0.101352
claw	14.280408	9034	66	0.043236
claw	11.898601	1697	12	0.008091
claw	12.986020	3697	27	0.017732
claw	15.658546	23394	172	0.112077
claw	16.161270	34120	244	0.162613
claw	13.810069	8133	48	0.057887
claw	14.719763	15468	91	0.129490
claw	15.307912	22379	136	0.177581
claw	14.768856	16391	93	0.121246
claw	16.764885	64901	375	0.514445
claw	15.076189	20119	116	0.157874
claw	15.194218	21331	126	0.156124
claw	15.383873	24116	144	0.191060
claw	15.014195	19464	111	0.148805
claw	11.932953	2244	13	0.018071
claw	13.245850	5595	32	0.037322
claw	15.292501	23784	135	0.184496
claw	14.590879	14822	83	0.111436
claw	14.187120	10851	62	0.078734
claw	14.504881	12791	78	0.097404
claw	13.430453	6151	37	0.044430

claw	13.623996	7481	42	0.066491
claw	16.401630	49432	291	0.357789
claw	16.946769	74548	426	0.578407
claw	15.098073	19960	117	0.139135
claw	14.023148	9592	55	0.070221
claw	12.270295	2813	16	0.021289
claw	18.704174	251159	1439	1.931480
claw	15.650294	30174	173	0.225329
claw	14.752694	16267	92	0.123028
claw	12.035486	2376	14	0.020777
claw	15.636738	28658	171	0.207457
claw	13.832396	8140	49	0.069072
claw	14.312458	11824	68	0.088219
claw	16.414421	50378	293	0.342499
claw	16.591522	66688	347	1.603370
claw	15.849723	40498	208	1.009850
claw	11.591522	2157	11	0.062071
claw	13.983261	10935	57	0.260259
claw	15.482871	32226	163	0.922177
claw	11.845098	2409	12	0.044243
claw	11.668885	2474	11	0.052569
claw	6.741467	69	0	0.000422
claw	14.295554	13809	69	0.266931
claw	14.351284	14004	72	0.272503
claw	9.868823	587	3	0.016000
claw	12.418907	3601	19	0.096392
claw	14.093418	11697	60	0.219290
claw	12.850578	4855	26	0.155776
claw	14.362629	13580	73	0.280000
claw	15.071588	23647	120	0.498812
claw	13.468879	8147	41	0.272568
claw	13.607215	8356	43	0.173098
claw	15.879511	39944	210	0.849441
claw	13.939304	11346	56	0.318209
claw	12.202124	3172	16	0.055370
claw	14.707790	18914	95	0.523766
claw	14.883216	21181	107	0.537003
claw	11.604553	2108	11	0.066986
claw	15.852505	41055	206	0.874600
claw	15.094573	23740	123	0.563029
claw	13.163650	6317	32	0.146367
claw	14.426789	14867	77	0.326595
claw	13.000528	5542	29	0.157359
claw	15.394396	30700	154	0.860394
claw	15.145972	30440	145	3.173690
claw	14.316706	17723	80	1.685480
claw	15.866216	51728	245	6.046950
claw	13.202430	8109	37	0.813273

claw	14.318755	17291	79	1.463140
claw	16.049593	59198	283	7.303470
claw	15.890597	52912	262	7.624450
claw	13.178976	7982	36	0.711555
claw	16.668636	90712	423	9.799120
claw	13.899546	13157	63	1.568310
claw	14.868533	24986	118	2.416860
claw	14.881926	26736	127	3.387140
claw	16.199864	64321	300	6.487720
claw	13.560930	10479	46	0.839254
claw	13.781974	11627	58	1.427090
claw	16.072133	60595	293	8.110430
claw	17.378540	148547	683	15.002600
claw	14.646390	22398	101	2.059490
claw	15.018635	29209	136	3.314940
claw	16.144758	60746	285	5.789540
claw	15.077525	29507	137	2.795080
claw	13.545809	10294	48	1.077980
claw	16.237826	66815	308	6.534990
claw	15.067350	29463	134	2.652250
claw	15.451469	38939	179	3.876440
claw	10.817783	1498	7	0.184316
claw	15.320166	35568	165	3.759400
claw	15.352595	36661	170	3.962570
claw	16.164927	62908	293	6.269140
claw	16.893290	104853	494	11.482200
claw	20.211654	539250	16	1.655430
claw	22.127037	2039873	62	6.381890
claw	18.889088	214716	6	0.658860
claw	24.043509	7703800	237	24.085000
claw	23.989630	7415003	228	22.736100
claw	24.459750	10277754	316	32.254000
claw	12.362218	3505	18	0.047125

```
[7]: display(df_witness)
```

	C_size	A_size	B_size	difficulty	#distinguished_points \
claw	1	1	1	0	9095
claw	1	1	1	0	19752
claw	1	1	1	0	8258
claw	1	1	1	0	5832
claw	1	1	1	0	125
claw	1	1	1	0	2177
claw	1	1	1	0	1344
claw	1	1	1	0	2475
claw	1	1	1	0	3539
claw	1	1	1	0	8221
claw	1	1	1	0	4519



claw	1	1	1	0	8335
claw	1	1	1	0	4987
claw	1	1	1	0	3730
claw	1	1	1	0	462
claw	1	1	1	0	1084
claw	1	1	1	0	2244
claw	1	1	1	0	1032
claw	1	1	1	0	246
claw	1	1	1	0	1892
claw	1	1	1	0	8666
claw	1	1	1	0	1145
claw	1	1	1	0	6096
claw	1	1	1	0	16129
claw	1	1	1	0	8731
claw	1	1	1	0	765
claw	1	1	1	0	12146
claw	1	1	1	0	4616
claw	1	1	1	0	19541
claw	1	1	1	0	2254
claw	1	1	1	1	14645
claw	1	1	1	1	1514
claw	1	1	1	1	11045
claw	1	1	1	1	1603
claw	1	1	1	1	2416
claw	1	1	1	1	3058
claw	1	1	1	1	2664
claw	1	1	1	1	1379
claw	1	1	1	1	5350
claw	1	1	1	1	1021
claw	1	1	1	1	12586
claw	1	1	1	1	6117
claw	1	1	1	1	20
claw	1	1	1	1	22134
claw	1	1	1	1	428
claw	1	1	1	1	2401
claw	1	1	1	1	6938
claw	1	1	1	1	618
claw	1	1	1	1	1525
claw	1	1	1	1	5550
claw	1	1	1	1	63
claw	1	1	1	1	444
claw	1	1	1	1	3015
claw	1	1	1	1	1812
claw	1	1	1	1	664
claw	1	1	1	1	6800
claw	1	1	1	1	7236
claw	1	1	1	1	714
claw	1	1	1	1	1206

claw	1	1	1	1	750
claw	1	1	1	2	1155
claw	1	1	1	2	851
claw	1	1	1	2	2950
claw	1	1	1	2	1907
claw	1	1	1	2	2006
claw	1	1	1	2	2899
claw	1	1	1	2	1292
claw	1	1	1	2	5794
claw	1	1	1	2	3216
claw	1	1	1	2	3485
claw	1	1	1	2	895
claw	1	1	1	2	2959
claw	1	1	1	2	1300
claw	1	1	1	2	4187
claw	1	1	1	2	900
claw	1	1	1	2	413
claw	1	1	1	2	3655
claw	1	1	1	2	1344
claw	1	1	1	2	3477
claw	1	1	1	2	117
claw	1	1	1	2	1972
claw	1	1	1	2	2006
claw	1	1	1	2	2393
claw	1	1	1	2	10741
claw	1	1	1	2	5227
claw	1	1	1	2	1686
claw	1	1	1	2	47
claw	1	1	1	2	3321
claw	1	1	1	2	5306
claw	1	1	1	2	4232
claw	1	1	1	3	30
claw	1	1	1	3	609
claw	1	1	1	3	723
claw	1	1	1	3	1722
claw	1	1	1	3	1015
claw	1	1	1	3	870
claw	1	1	1	3	5896
claw	1	1	1	3	1464
claw	1	1	1	3	691
claw	1	1	1	3	1427
claw	1	1	1	3	2048
claw	1	1	1	3	846
claw	1	1	1	3	278
claw	1	1	1	3	8495
claw	1	1	1	3	2714
claw	1	1	1	3	3984
claw	1	1	1	3	3649

claw	1	1	1	3	1387
claw	1	1	1	3	19547
claw	1	1	1	3	674
claw	1	1	1	3	1166
claw	1	1	1	3	278
claw	1	1	1	3	1798
claw	1	1	1	3	8097
claw	1	1	1	3	12229
claw	1	1	1	3	140
claw	1	1	1	3	2729
claw	1	1	1	3	2055
claw	1	1	1	3	4939
claw	1	1	1	3	595
claw	2	2	2	0	1608749
claw	2	2	2	0	3156633
claw	2	2	2	0	1641335
claw	2	2	2	0	912233
claw	2	2	2	0	1685393
claw	2	2	2	0	116554
claw	2	2	2	0	491126
claw	2	2	2	0	67359
claw	2	2	2	0	92476
claw	2	2	2	0	2010810
claw	2	2	2	0	550976
claw	2	2	2	0	1711257
claw	2	2	2	0	2488255
claw	2	2	2	0	7913
claw	2	2	2	0	1639817
claw	2	2	2	0	377608
claw	2	2	2	0	4409351
claw	2	2	2	0	709287
claw	2	2	2	0	117957
claw	2	2	2	0	2466145
claw	2	2	2	0	756534
claw	2	2	2	0	1306583
claw	2	2	2	0	4493846
claw	2	2	2	0	607685
claw	2	2	2	0	827664
claw	2	2	2	0	565073
claw	2	2	2	0	464584
claw	2	2	2	0	3606
claw	2	2	2	0	164479
claw	2	2	2	0	1031733
claw	2	2	2	1	592055
claw	2	2	2	1	1940084
claw	2	2	2	1	122372
claw	2	2	2	1	2784632
claw	2	2	2	1	1054377

claw	2	2	2	1	1537457
claw	2	2	2	1	175543
claw	2	2	2	1	121522
claw	2	2	2	1	1623515
claw	2	2	2	1	14240
claw	2	2	2	1	991850
claw	2	2	2	1	447399
claw	2	2	2	1	634645
claw	2	2	2	1	1777850
claw	2	2	2	1	441006
claw	2	2	2	1	43904
claw	2	2	2	1	1200164
claw	2	2	2	1	255631
claw	2	2	2	1	1967351
claw	2	2	2	1	233814
claw	2	2	2	1	802510
claw	2	2	2	1	470252
claw	2	2	2	1	36708
claw	2	2	2	1	1277743
claw	2	2	2	1	326623
claw	2	2	2	1	1319995
claw	2	2	2	1	197469
claw	2	2	2	1	79795
claw	2	2	2	1	376425
claw	2	2	2	1	2388279
claw	2	2	2	2	379457
claw	2	2	2	2	487122
claw	2	2	2	2	2287392
claw	2	2	2	2	1908631
claw	2	2	2	2	9889
claw	2	2	2	2	964881
claw	2	2	2	2	38760
claw	2	2	2	2	2284183
claw	2	2	2	2	366825
claw	2	2	2	2	487233
claw	2	2	2	2	806635
claw	2	2	2	2	669472
claw	2	2	2	2	1135229
claw	2	2	2	2	441196
claw	2	2	2	2	138072
claw	2	2	2	2	346727
claw	2	2	2	2	5186368
claw	2	2	2	2	38933
claw	2	2	2	2	98495
claw	2	2	2	2	155511
claw	2	2	2	2	1687818
claw	2	2	2	2	134405
claw	2	2	2	2	1773712

claw	2	2	2	2	335914
claw	2	2	2	2	108928
claw	2	2	2	2	464312
claw	2	2	2	2	1064160
claw	2	2	2	2	783764
claw	2	2	2	2	844240
claw	2	2	2	2	112242
claw	2	2	2	3	239696
claw	2	2	2	3	75465
claw	2	2	2	3	1996554
claw	2	2	2	3	687146
claw	2	2	2	3	144090
claw	2	2	2	3	1212736
claw	2	2	2	3	790754
claw	2	2	2	3	1155910
claw	2	2	2	3	1905496
claw	2	2	2	3	227409
claw	2	2	2	3	83251
claw	2	2	2	3	642995
claw	2	2	2	3	1755623
claw	2	2	2	3	542621
claw	2	2	2	3	222182
claw	2	2	2	3	349709
claw	2	2	2	3	23965
claw	2	2	2	3	304046
claw	2	2	2	3	5612784
claw	2	2	2	3	733292
claw	2	2	2	3	126078
claw	2	2	2	3	205937
claw	2	2	2	3	603281
claw	2	2	2	3	1106590
claw	2	2	2	3	1050489
claw	2	2	2	3	92372
claw	2	2	2	3	1847974
claw	2	2	2	3	429447
claw	2	2	2	3	2139531
claw	2	2	2	3	206567
claw	3	3	3	0	46362545
claw	3	3	3	0	114516253
claw	3	3	3	0	61628467
claw	3	3	3	0	627233816
claw	3	3	3	0	112983475
claw	3	3	3	0	139431156
claw	3	3	3	0	19867610
claw	3	3	3	0	149660906
claw	3	3	3	0	439009981
claw	3	3	3	0	113195363
claw	3	3	3	0	23140782

claw	3	3	3	0	176078821
claw	3	3	3	0	480373554
claw	3	3	3	0	713211613
claw	3	3	3	0	1014551994
claw	3	3	3	0	1327130623
claw	3	3	3	0	113407685
claw	3	3	3	0	279807993
claw	3	3	3	0	168669586
claw	3	3	3	0	383845977
claw	3	3	3	0	321111045
claw	3	3	3	0	362298050

	#distinguished_points_log2	#collisions	#updates	time(sec)
claw	13.150858	3779	30	0.020880
claw	14.269711	8185	65	0.033012
claw	13.011577	3523	27	0.013233
claw	12.509775	2378	19	0.009608
claw	6.965784	49	0	0.000105
claw	11.088126	870	7	0.003387
claw	10.392317	564	4	0.002125
claw	11.273213	1025	8	0.005824
claw	11.789126	1387	11	0.006033
claw	13.005098	3400	27	0.013345
claw	12.141788	1849	15	0.007329
claw	13.024966	3340	27	0.016991
claw	12.283956	2096	16	0.008810
claw	11.864960	1537	12	0.009490
claw	8.851749	185	1	0.001240
claw	10.082149	470	3	0.003049
claw	11.131857	873	7	0.006270
claw	10.011227	423	3	0.002952
claw	7.942515	103	0	0.000705
claw	10.885696	749	6	0.004525
claw	13.081151	3676	28	0.018799
claw	10.161132	502	3	0.001735
claw	12.573647	2485	20	0.012205
claw	13.977369	6650	53	0.026688
claw	13.091931	3629	29	0.014235
claw	9.579316	276	2	0.001151
claw	13.568194	4997	40	0.019999
claw	12.172428	1861	15	0.007527
claw	14.254217	7970	65	0.032165
claw	11.138272	959	7	0.003570
claw	13.838121	7834	49	0.045448
claw	10.564149	835	5	0.004065
claw	13.431106	5906	37	0.034784
claw	10.646559	849	5	0.005956
claw	11.238405	1284	8	0.007231

claw	11.578373	1566	10	0.012854
claw	11.379378	1478	8	0.010826
claw	10.429407	753	4	0.004372
claw	12.385323	2959	17	0.021983
claw	9.995767	548	3	0.002739
claw	13.619532	6709	42	0.039676
claw	12.578609	3283	20	0.017648
claw	4.321928	3	0	0.000025
claw	14.433977	11931	74	0.061878
claw	8.741467	228	1	0.002258
claw	11.229420	1219	8	0.008139
claw	12.760304	3860	23	0.021642
claw	9.271463	325	2	0.002004
claw	10.574594	785	5	0.005443
claw	12.438272	2990	18	0.023573
claw	5.977280	16	0	0.000175
claw	8.794416	222	1	0.000947
claw	11.557942	1623	10	0.010663
claw	10.823367	981	6	0.007831
claw	9.375039	370	2	0.004045
claw	12.731319	3619	22	0.022235
claw	12.820977	3818	24	0.020192
claw	9.479780	358	2	0.002419
claw	10.236014	700	4	0.003527
claw	9.550747	419	2	0.002314
claw	10.173677	715	4	0.017555
claw	9.733015	568	2	0.005552
claw	11.526499	1904	10	0.043566
claw	10.897089	1177	6	0.016107
claw	10.970106	1356	7	0.027492
claw	11.501340	1815	10	0.025236
claw	10.335390	893	4	0.012529
claw	12.500344	4020	20	0.059459
claw	11.651052	2043	11	0.033229
claw	11.766943	2203	12	0.032666
claw	9.805744	666	3	0.004394
claw	11.530894	2209	10	0.039959
claw	10.344296	780	4	0.009124
claw	12.031701	2737	15	0.065652
claw	9.813781	530	3	0.006633
claw	8.689998	281	1	0.002262
claw	11.835656	2292	12	0.027513
claw	10.392317	949	4	0.012620
claw	11.763627	2030	12	0.039275
claw	6.870365	65	0	0.000601
claw	10.945444	1162	6	0.018181
claw	10.970106	1371	6	0.014455
claw	11.224605	1506	8	0.016019

claw	13.390841	6971	37	0.093674
claw	12.351767	3381	18	0.051470
claw	10.719389	1055	6	0.025817
claw	5.554589	23	0	0.000297
claw	11.697402	1996	11	0.025454
claw	12.373409	3554	18	0.038461
claw	12.047124	2972	15	0.070379
claw	4.906891	17	0	0.001089
claw	9.250298	511	2	0.025860
claw	9.497852	631	3	0.075026
claw	10.749869	1450	6	0.034456
claw	9.987264	894	4	0.063173
claw	9.764872	708	3	0.078117
claw	12.525521	5035	21	0.184577
claw	10.515700	1281	5	0.057518
claw	9.432542	596	2	0.018394
claw	10.478770	1274	4	0.018406
claw	11.000000	1738	8	0.104722
claw	9.724514	741	3	0.043110
claw	8.118941	198	1	0.031539
claw	13.052398	7168	34	0.462627
claw	11.406205	2339	12	0.242580
claw	11.960002	3386	15	0.171632
claw	11.833285	3033	14	0.156990
claw	10.437752	1228	6	0.113671
claw	14.254660	16283	76	0.959679
claw	9.396605	540	2	0.023768
claw	10.187352	986	4	0.058934
claw	8.118941	261	0	0.005094
claw	10.812177	1550	7	0.096088
claw	12.983172	6952	31	0.394046
claw	13.578019	10493	53	0.992740
claw	7.129283	112	1	0.053624
claw	11.414157	2180	10	0.102060
claw	11.004923	1823	7	0.063196
claw	12.270003	3897	20	0.296013
claw	9.216746	479	2	0.010550
claw	20.617508	651126	22	1.398220
claw	21.589955	1277766	43	2.739890
claw	20.646438	663997	22	1.422660
claw	19.799043	368182	12	0.772742
claw	20.684654	681185	23	1.454230
claw	16.830639	44766	1	0.096706
claw	18.905734	197925	6	0.424054
claw	16.039583	27073	0	0.057243
claw	16.496791	34628	1	0.076522
claw	20.939345	814754	27	1.738000
claw	19.071630	221325	7	0.464597



claw	20.706625	692605	23	1.484440
claw	21.246703	1007133	34	2.105150
claw	12.950009	1090	0	0.004665
claw	20.645103	662712	22	1.392600
claw	18.526530	150867	5	0.318707
claw	22.072135	1789610	60	3.815810
claw	19.436010	286748	9	0.601449
claw	16.847902	45631	1	0.099823
claw	21.233826	1001430	33	2.142370
claw	19.529045	304714	10	0.664936
claw	20.317367	530710	17	1.137620
claw	22.099519	1825722	61	3.952610
claw	19.212964	244201	8	0.512075
claw	19.658686	332731	11	0.698992
claw	19.108078	228338	7	0.477710
claw	18.825580	185548	6	0.390503
claw	11.816184	253	0	0.001941
claw	17.327544	64175	2	0.141170
claw	19.976638	415728	14	0.890494
claw	19.175372	406867	8	1.118540
claw	20.887688	1340308	26	3.604920
claw	16.900914	83034	1	0.232124
claw	21.409055	1926785	38	5.306180
claw	20.007959	728101	14	2.008520
claw	20.552115	1060269	21	2.916100
claw	17.421465	119192	2	0.325868
claw	16.890858	82920	1	0.227654
claw	20.630689	1123717	22	3.084550
claw	13.797662	6541	0	0.023391
claw	19.919762	685898	13	1.885420
claw	18.771203	307190	6	0.830951
claw	19.275590	438597	8	1.210520
claw	20.761702	1228049	24	3.301870
claw	18.750439	303701	6	0.834877
claw	15.422065	28037	0	0.079473
claw	20.194800	828976	16	2.274110
claw	17.963703	174621	3	0.473364
claw	20.907823	1358943	27	3.647300
claw	17.835002	158535	3	0.442757
claw	19.614160	555826	11	1.503980
claw	18.843075	323218	6	0.895501
claw	15.163807	22543	0	0.066477
claw	20.285166	884680	17	2.434280
claw	18.317267	224472	4	0.620326
claw	20.332101	910452	18	2.510110
claw	17.591267	135878	2	0.378988
claw	16.284011	53175	1	0.148394
claw	18.522003	257554	5	0.710018

claw	21.187540	1656500	32	4.441310
claw	18.533577	333433	5	1.404530
claw	18.893924	430237	6	1.787390
claw	21.125272	2025993	31	8.488190
claw	20.864107	1689509	26	7.012930
claw	13.271609	6374	0	0.034840
claw	19.879991	852685	13	3.538660
claw	15.242281	32241	0	0.142524
claw	21.123247	2023702	31	8.431180
claw	18.484732	324713	5	1.373190
claw	18.894252	430022	6	1.793480
claw	19.621556	713798	11	2.971840
claw	19.352664	592008	9	2.450190
claw	20.114552	1005079	15	4.248200
claw	18.751060	389547	6	1.659150
claw	17.075061	121514	1	0.497958
claw	18.403441	306001	4	1.279650
claw	22.306293	4596380	71	19.016800
claw	15.248706	32356	0	0.135979
claw	16.587763	84685	1	0.365435
claw	17.246657	135473	2	0.570259
claw	20.686728	1494596	23	6.275690
claw	17.036227	118068	1	0.487967
claw	20.758340	1569700	24	6.658270
claw	18.357732	296295	4	1.205150
claw	16.733015	94316	1	0.406305
claw	18.824735	409699	6	1.724190
claw	20.021284	941752	14	3.985670
claw	19.580060	694737	10	2.875550
claw	19.687294	746968	11	3.133230
claw	16.776253	97572	1	0.403400
claw	17.870846	226872	3	1.622080
claw	16.203520	70902	1	0.545230
claw	20.929081	1901727	27	14.325000
claw	19.390257	653201	9	4.824740
claw	17.136611	137230	1	1.094580
claw	20.209834	1154158	16	8.621290
claw	19.592869	753162	10	5.826710
claw	20.140598	1101468	15	8.176260
claw	20.861735	1813578	26	13.924600
claw	17.794930	215110	3	1.530900
claw	16.345180	77848	1	0.562606
claw	19.294448	612206	8	4.627130
claw	20.743552	1670781	24	12.428200
claw	19.049585	515384	7	3.884620
claw	17.761382	210689	3	1.584630
claw	18.415795	332615	4	2.545650
claw	14.548641	21305	0	0.196118

claw	18.213930	288077	4	2.246270
claw	22.420285	5346236	77	39.877400
claw	19.484028	697138	10	5.228900
claw	16.943957	119401	1	0.892210
claw	17.651844	195707	2	1.791620
claw	19.202471	573090	8	4.477500
claw	20.077689	1052410	15	7.969110
claw	20.002630	999403	14	7.920660
claw	16.495168	86359	1	0.663153
claw	20.817513	1759156	25	13.445800
claw	18.712121	408797	5	3.048310
claw	21.028863	2037525	29	15.801900
claw	17.656250	196415	2	1.444620
claw	25.466456	17609057	2	47.151400
claw	26.770977	44101019	6	140.329000
claw	25.877094	23432615	3	60.982900
claw	29.224428	244452250	35	622.844000
claw	26.751537	43435875	6	113.519000
claw	27.054978	54332597	7	138.257000
claw	24.243915	7223229	1	19.272400
claw	27.157122	57815672	8	194.980000
claw	28.709678	171332430	24	436.051000
claw	26.754240	43523481	6	111.272000
claw	24.463934	8316388	1	22.682300
claw	27.391646	68753667	9	174.501000
claw	28.839581	187046774	27	484.604000
claw	29.409755	277953909	40	720.040000
claw	29.918196	395733753	57	1032.410000
claw	30.305663	517976439	75	1463.840000
claw	26.756943	43615427	6	113.405000
claw	28.059862	109092182	15	281.994000
claw	27.329625	65310477	9	173.537000
claw	28.515952	149611651	21	385.841000
claw	28.258497	124828320	18	433.841000
claw	28.432602	140937755	20	423.094000

### 3 Fresh

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