Solution GPS

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Question

Voici les données satellites de l'endroit où vous vous trouvez.

x	y	z	t
0.64448260	1.16022870	3.95006021	66.833094
0.92929350	1.98938571	3.54164117	70.456481
-0.37438097	1.92553319	3.67649628	68.990280
-0.01905017	1.01293692	4.04203661	65.588732

Solution

```
## [1] 1.00002586962299
```

```
## [1] 27.1741669999957
```

```
## [1] 78.0422219999996
```

```
## # A tibble: 1 x 3
##   nom        latitude longitude
##   <chr>         <dbl>     <dbl>
## 1 taj-mahal      27.2      78.0
```

Créer plusieurs problèmes

```
N <- 100 # Nombre de problemes differents
num_satellites <- 4
donnees <- lapply(1:N, function(x) matrix(0, num_satellites, 4))
sols <- character(length = N)
for (i in (1:N)){
  numero <- sample(1:nrow(data), 1)
  donnees[[i]] <- creation_gps(data, numero, num_satellites = num_satellites)
  sols[i] <- data[numero, ]$nom
}
```

Exercice 1 .

x	y	z	t
1.94672559	-0.17004210	3.68046319	59.754118
2.38623014	-0.89733731	3.29623354	60.755986
2.41759012	0.39456253	3.37105956	60.792902
2.82304359	0.64105578	2.99732154	61.348899

Exercice 2 .

x	y	z	t
1.99024229	0.61726759	3.60865355	28.018200
1.57591159	1.45359819	3.57323650	28.713849
1.70649252	1.67310568	3.41365856	29.492201
1.46923955	1.10734044	3.73892984	27.669181

Exercice 3 .

x	y	z	t
-0.41448395	0.75177201	4.07768390	24.446210
-0.78075296	1.98126122	3.58182815	20.841854
-0.60914500	1.81434902	3.70155969	21.588146
-1.14698888	0.31551200	3.99366157	23.634869

Exercice 4 .

x	y	z	t
2.04473186	0.30311186	3.61823975	40.375463
2.88127472	1.86920420	2.35982960	42.349131
2.39203834	1.53995253	3.04485843	42.390385
2.21814936	1.53852694	3.17446253	42.187907

Exercice 5 .

x	y	z	t
-1.14914188	0.61841633	3.95746109	8.289013
-2.11036497	0.41712786	3.56886931	6.701048
-1.22219572	1.18894842	3.80224978	6.780428
-0.75445363	1.25687837	3.90070770	7.786140

Exercice 6 .

x	y	z	t
0.84227447	1.72370968	3.69917055	70.511137
-0.37562919	1.36393496	3.91957246	72.918930
0.66299134	1.93767996	3.62909120	70.109321
0.10882300	1.14479057	4.00525607	72.927902

Exercice 7 .

x	y	z	t
1.40459637	0.25327387	3.91502560	10.863771
0.19828722	-0.84590541	4.07548651	4.980964
1.00524846	-0.62177796	3.99591439	9.058833
1.66036758	0.78201410	3.74113586	11.844187

Exercice 8 .

x	y	z	t
2.69119969	1.43696251	2.83849381	33.628904
2.40312330	0.24486729	3.39551212	33.433273
2.71223946	0.28503243	3.15071067	33.884319
2.94577863	0.14377366	2.94383789	33.943579

Exercice 9 .

x	y	z	t
3.31856954	0.12356128	2.51719941	11.503911
2.64837612	0.83340181	3.10741202	11.654588
3.39334411	0.58385557	2.34708170	11.060257
3.32672925	-0.55083305	2.44824825	11.076770

Exercice 10 .

x	y	z	t
-0.04589866	1.19607893	3.99145996	103.353547
-1.97662048	0.98189019	3.53459011	99.087746
-1.23021191	1.23194055	3.78594311	100.136417
-1.44892291	0.53217445	3.87064295	101.265517

Exercice 11 .

x	y	z	t
-1.89397976	1.27279401	3.48673202	54.942725
-1.00481055	0.57515393	4.00300110	58.541510
-1.62157738	1.39529147	3.57604706	55.242877
-1.33494801	1.06247214	3.80177996	56.585923

Exercice 12 .

x	y	z	t
2.25158249	1.75901614	3.03326600	26.389863
2.57640516	1.14081969	3.07003762	26.473707
2.36143804	1.22307945	3.20813827	26.331847
2.91269026	0.97150270	2.81724724	26.434973

Exercice 13 .

x	y	z	t
2.94961115	1.93287416	2.21996748	5.173571
2.62494313	1.96161133	2.57414426	6.206545
2.60832579	2.23771055	2.35664002	5.600510
1.98197274	2.59737426	2.58648316	5.825126

Exercice 14 .

x	y	z	t
2.71556549	-0.15710341	3.15681591	13.982553
2.36939668	-0.27231643	3.41705534	13.239180
1.54297377	0.37724797	3.85245117	10.485330
2.87605003	-0.74474709	2.92201165	14.083072

Exercice 15 .

x	y	z	t
2.65230076	2.21108214	2.33256951	1.982888
2.27387980	2.05029156	2.82670113	3.198035
3.38393315	1.45139176	1.95113363	0.369103
2.55092003	2.73836719	1.83265278	0.195861

Exercice 16 .

x	y	z	t
-2.12565888	1.29059189	3.34371216	75.870503
-1.30643532	0.99945590	3.82867846	78.190931
-0.98099229	1.56133862	3.73688907	77.760563
-0.12547480	0.82011407	4.08364213	81.725784

Exercice 17 .

x	y	z	t
-0.48317262	-1.26777519	3.94001959	16.954833
1.14740759	-1.44417786	3.73661213	17.726280
1.17741239	-1.01309107	3.86675712	15.648370
0.04309731	-1.74225231	3.78512399	19.338893

Exercice 18 .

x	y	z	t
3.05733901	0.04404431	2.83111327	60.600685
3.57802722	0.48735004	2.07958535	59.581105
2.83661388	-0.36270519	3.03092902	60.266503
2.16297267	0.60176991	3.51053932	60.457854

Exercice 19 .

x	y	z	t
-0.24501159	0.95360934	4.04908170	2.397156
-0.69557253	0.56816209	4.06913194	3.406189
0.79346691	0.64584391	4.03952472	5.109634
0.97009810	0.52392857	4.01856599	5.901655

Exercice 20 .

x	y	z	t
2.81204606	1.21662075	2.82430434	11.654694
1.82913521	2.36567444	2.90212214	10.472989
2.38048133	1.32945817	3.15124003	11.459693
2.36443999	1.00373925	3.28121855	11.163391

Exercice 21 .

x	y	z	t
0.63005619	1.92434524	3.64203084	22.010174
0.68544885	2.16176948	3.49590856	22.960028
-0.17757363	2.54826593	3.29230503	23.499164
0.29309227	2.16576277	3.54796176	22.673500

Exercice 22 .

x	y	z	t
1.45234880	1.08254807	3.75276388	74.353068
2.11674492	0.25322631	3.58046526	74.573660
1.25653525	0.01649758	3.97307326	71.204872
2.52863851	1.06878188	3.13498910	77.452064

Exercice 23 .

x	y	z	t
0.16818774	1.02205476	4.03628307	5.131946
0.12825905	1.10090350	4.01696716	4.933388
0.47037825	1.56152588	3.83468973	3.188927
1.14739172	0.93929291	3.89431447	4.460614

Exercice 24 .

x	y	z	t
1.66815749	-3.02140050	2.33513461	57.415304
0.38308655	-2.58772649	3.24366774	57.470539
0.59539471	-2.63978645	3.16883208	57.693495
0.62569609	-3.01104786	2.81186047	57.989875

Exercice 25 .

x	y	z	t
1.69807410	2.00015365	3.23734364	35.034626
0.58967962	1.80966494	3.70700079	31.004531
2.12778034	1.05533138	3.42392912	34.538638
1.90456492	1.57141313	3.35674803	34.975449

Exercice 26 .

x	y	z	t
1.74974519	0.18344732	3.77745985	52.325038
2.56035018	0.05823088	3.28719945	53.900321
2.42299351	1.00705264	3.23719192	55.028062
2.26798312	0.70227390	3.42454785	54.410872

Exercice 27 .

x	y	z	t
-0.97005770	2.87056493	2.86064837	45.504382
-1.33604625	2.11405779	3.33319729	44.905514
-1.37987308	2.58548696	2.96237599	45.556459
-1.28759708	2.48055818	3.09085570	45.425206

Exercice 28 .

x	y	z	t
-0.85616360	-1.25833279	3.87918117	42.968005
0.03153178	-1.24148465	3.97771111	43.200374
-0.05856146	-2.08011687	3.61028371	47.115620
0.13021912	-1.48058757	3.89298953	44.355425

Exercice 29 .

x	y	z	t
1.99871977	0.97797728	3.52322918	45.644041
2.43949766	0.97310065	3.23518012	46.563993
1.64234313	0.97615894	3.70328055	44.686633
2.27586904	0.50536303	3.45390973	45.692965

Exercice 30 .

x	y	z	t
1.25877631	1.75922967	3.56160880	10.939563
-0.35824830	2.49496575	3.31832310	12.399239
0.48788162	1.77617018	3.73786772	10.647289
1.38672114	1.98504827	3.39132009	11.834881

Exercice 31 .

x	y	z	t
0.24190374	-0.08907007	4.15908802	19.000531
-0.48203660	1.09108276	3.99269874	25.736663
-0.70987772	1.80938141	3.68601094	29.551097
0.16290556	0.72420685	4.10042075	23.120030

Exercice 32 .

x	y	z	t
3.49591520	1.11969132	1.97213903	43.694536
3.45279960	1.20153923	1.99973560	43.708185
2.25379111	0.05512427	3.50454719	44.840269
2.16646789	1.36907182	3.28580634	44.481732

Exercice 33 .

x	y	z	t
1.90830960	-0.65970155	3.64521775	36.331934
1.77997248	0.49071303	3.73568773	35.658089
1.48405242	0.23902391	3.88650487	34.821256
2.99980297	0.34522109	2.87166653	38.631901

Exercice 34 .

x	y	z	t
1.76285641	2.03775709	3.17873361	66.734361
0.93058835	1.18818655	3.88415784	62.666716
1.87945553	1.10008281	3.55273540	65.789289
1.79323905	0.96510609	3.63556434	65.259924

Exercice 35 .

x	y	z	t
2.02866907	2.99613068	2.06692208	51.649560
2.82021230	1.80244051	2.48235269	53.503171
2.56707747	2.02981717	2.57961618	53.803530
2.68717769	1.10542384	2.98690112	54.284273

Exercice 36 .

x	y	z	t
-1.23233375	1.05556618	3.83817635	65.500171
-1.32416036	1.49792463	3.65612982	64.344163
-1.71729483	1.73497408	3.37716264	63.053088
-1.11770798	1.71256622	3.63074509	64.400185

Exercice 37 .

x	y	z	t
1.11270035	-0.10396143	4.01441827	10.127940
1.64269909	0.16560477	3.82603958	12.672631
1.01338663	0.16788763	4.03848058	9.550209
1.68203513	-0.43193636	3.78796157	13.006767

Exercice 38 .

x	y	z	t
1.55080100	1.95191440	3.33908828	36.185763
1.59537584	1.04892731	3.70391570	34.675351
1.27821487	1.92866373	3.46567267	35.291268
1.94838124	1.18450477	3.48786799	35.996072

Exercice 39 .

x	y	z	t
0.70364109	-1.15977596	3.94008541	9.551046
-0.20148355	-1.30181581	3.95337123	10.230968
-0.80675416	-0.57476785	4.04762322	6.446189
0.09206580	-0.62219004	4.11932853	6.955010

Exercice 40 .

x	y	z	t
2.82530613	0.20749452	3.05598681	32.850407
1.52482097	-0.37537171	3.85985507	29.474262
1.95074374	0.61468958	3.63059495	30.437387
2.65788410	0.18411274	3.20409405	32.568013

Exercice 41 .

x	y	z	t
2.42627994	-0.75273660	3.30318291	95.107052
2.90852741	-0.95585379	2.82688450	94.415457
2.31092139	-0.40822924	3.44346560	95.705659
1.61318253	-1.46766373	3.55078433	95.807708

Exercice 42 .

x	y	z	t
2.13804811	-1.27413823	3.34212300	68.351505
1.99574918	-1.02799475	3.51065181	68.801589
1.80122636	-0.67895608	3.69581741	69.546739
2.03048141	-1.91879059	3.09190104	68.185078

Exercice 43 .

x	y	z	t
-1.85106510	2.34409496	2.90572554	56.519721
-1.40992662	2.02190582	3.35983152	56.024804
-1.04764744	2.00158139	3.50150980	55.737214
-0.13080267	2.91208355	2.97777167	55.590261

Exercice 44 .

x	y	z	t
-1.11385967	2.60568242	3.05519228	24.051349
-1.11872339	2.33052726	3.26826632	23.724622
-0.68380782	2.45682240	3.29558715	23.449343
-1.23540018	2.81390893	2.81427913	24.234799

Exercice 45 .

x	y	z	t
-0.57354127	1.90953508	3.65912425	86.435889
0.08936691	2.14650559	3.57057298	84.926474
0.36476263	2.52789362	3.29259262	83.769887
0.63696421	1.84995618	3.67918508	85.087352

Exercice 46 .

x	y	z	t
0.77984220	-2.53871187	3.21111387	70.412436
0.65385840	-2.68978389	3.11480271	70.553401
0.92624328	-2.89263376	2.85292962	70.780849
1.51457947	-1.79965937	3.43972953	68.850438

Exercice 47 .

x	y	z	t
3.01244406	-0.20180738	2.87209308	66.348144
3.19242673	1.17456173	2.40692343	66.010883
2.24139281	0.31392543	3.49886742	66.456541
3.07582233	0.58748839	2.74929782	66.687456

Exercice 48 .

x	y	z	t
0.89148344	-3.06002408	2.68439453	9.665031
0.38565739	-2.87485933	2.99180820	9.396816
1.21268934	-2.52347763	3.08640718	9.249019
0.46481075	-2.93429179	2.92204496	9.492865

Exercice 49 .

x	y	z	t
2.51589788	1.23055906	3.08552205	67.007726
1.11013591	2.08458724	3.43315575	64.518563
1.69060589	1.22489593	3.60637571	64.934339
2.08183360	0.70791920	3.53967277	64.823760

Exercice 50 .

x	y	z	t
1.23027939	1.60226232	3.64467175	38.909196
1.74578358	1.17643588	3.59620667	39.702371
1.85657129	1.97469533	3.16515173	41.381547
1.47711963	1.61349087	3.54672087	39.733365

Exercice 51 .

x	y	z	t
2.55486045	0.86571538	3.17611226	71.796001
2.55036444	0.07881906	3.29452468	72.502483
1.63650663	-0.53279589	3.79505450	69.944418
2.51696048	-0.14739821	3.31777754	72.494463

Exercice 52 .

x	y	z	t
1.09498743	1.63201386	3.67450642	27.263204
1.38634428	1.42853074	3.66084875	27.869487
1.83330794	1.18122689	3.55079556	28.729321
2.22253981	1.42067076	3.22590692	30.216195

Exercice 53 .

x	y	z	t
2.98265921	0.93331586	2.75628911	36.767859
2.39995757	0.39688263	3.38336400	36.827458
2.14521537	1.28630926	3.33285517	36.199197
2.70680118	0.67571298	3.09533575	37.001753

Exercice 54 .

x	y	z	t
2.31994898	2.92630043	1.84907183	73.550086
2.17842526	2.60817435	2.41171185	75.433508
2.71099319	2.88477055	1.30118365	71.714418
2.23240243	2.46099414	2.51482630	75.817646

Exercice 55 .

x	y	z	t
-1.16156740	2.40130304	3.20140110	58.788310
-1.24189700	2.01102558	3.43189919	58.181938
-1.43729421	2.02241102	3.34791026	58.306709
-0.71129111	3.28974524	2.45684865	58.627202

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Exercice 56 .

x	y	z	t
2.82291823	-0.08742889	3.06397665	10.281143
2.87871071	-0.53495959	2.96501382	10.327357
2.60816225	-1.09282384	3.06066820	9.468021
2.99064542	-0.11748581	2.89943118	10.518166

Exercice 57 .

x	y	z	t
3.29361904	0.32315675	2.53221393	4.193936
3.29963254	0.40709125	2.51220340	4.134652
2.91694346	0.23199866	2.96683022	4.710586
2.27216572	0.90654143	3.37341217	4.043305

Exercice 58 .

x	y	z	t
-0.64072404	0.18674206	4.11327901	12.159925
-0.29977675	1.79002169	3.75105590	6.261686
-0.99485703	1.41851260	3.78979493	6.847478
-1.02309424	1.56140493	3.72555458	6.291999

Exercice 59 .

x	y	z	t
1.44617623	1.97354007	3.37315550	75.630312
-0.15543669	1.21318288	3.98352743	71.462055
0.45256882	1.85575843	3.70348568	74.782790
-0.62645085	2.25918163	3.44501405	74.996742

Exercice 60 .

x	y	z	t
2.32125647	-0.18405406	3.45577149	46.506335
3.23302634	0.44589792	2.59098048	48.640176
2.65836969	1.15009542	2.99579959	49.025208
2.68412964	0.78413362	3.08950589	48.759192

Exercice 61 .

x	y	z	t
0.00540188	0.45196285	4.14248289	3.992593
-0.03375041	1.76890460	3.77283733	10.535926
0.52626744	1.57119743	3.82345986	8.772665
-0.69373357	0.44296821	4.08496964	4.754185

Exercice 62 .

x	y	z	t
2.82960543	1.75309310	2.50688289	27.933994
2.23075131	2.14872978	2.78768238	27.042516
2.42820654	0.50208239	3.34905813	26.815330
2.32441305	1.13111465	3.26835550	27.311215

Exercice 63 .

x	y	z	t
2.12957170	0.02347544	3.58173664	41.477020
2.15237783	1.19297809	3.36281683	44.222508
2.68138532	0.40960611	3.16336208	43.845236
1.98841608	1.29339993	3.42604469	43.931031

Exercice 64 .

x	y	z	t
1.24078451	-0.22769871	3.97153260	62.972026
0.49328058	0.64144862	4.08774779	58.907430
1.54401674	-1.13992941	3.69878863	64.464553
1.32082899	-0.50006409	3.92043502	63.407259

Exercice 65 .

x	y	z	t
3.36699489	-0.64227324	2.36966127	26.840284
2.98876615	1.05398813	2.70570693	27.165064
3.19199373	0.57534142	2.61622292	27.521253
2.66839358	1.00354004	3.03925109	27.425665

Exercice 66 .

x	y	z	t
2.55772971	0.63845841	3.22720524	15.259559
2.88855339	-0.99178235	2.83497640	14.822143
3.43242427	-0.19207185	2.35500236	14.496864
3.71201155	-0.88825100	1.67225730	12.269682

Exercice 67 .

x	y	z	t
2.39924134	2.32031943	2.49483924	37.309181
2.12702095	1.46374980	3.27073119	37.417347
1.48765662	1.60138827	3.54780178	36.163270
2.52961865	1.20223252	3.08547087	37.741902

Exercice 68 .

x	y	z	t
2.55762466	0.82200298	3.18548760	6.087790
1.57055532	1.77352362	3.42818232	5.471549
1.28006903	1.04533396	3.82533192	3.139067
0.93829065	1.68614846	3.69336948	3.225005

Exercice 69 .

x	y	z	t
1.04389511	-0.59240560	3.99046397	58.616967
2.54705413	-1.26272107	3.04672199	55.102799
1.92796162	-2.10541654	3.03556408	55.599383
1.24824745	-2.15960901	3.33802806	56.871668

Exercice 70 .

x	y	z	t
-1.45074238	2.19807723	3.22928275	5.556112
-0.00355353	2.21503642	3.52959843	3.726277
-1.66234414	2.58506395	2.81398657	6.004298
-0.76968589	2.15255101	3.48404533	4.931236

Exercice 71 .

x	y	z	t
-1.90877743	1.98034240	3.13037966	24.245226
-1.11679727	1.77685992	3.59999955	22.204906
-1.26051533	2.43782307	3.13569511	23.477899
-1.28044195	2.14953674	3.33233016	23.214359

Exercice 72 .

x	y	z	t
-1.69625901	2.69814536	2.68461936	21.641454
-1.05990752	1.51743959	3.73342165	19.379588
-0.99709193	2.78596798	2.93405082	21.558189
-1.36790718	1.99760971	3.39158510	20.760979

Exercice 73 .

x	y	z	t
0.84092680	0.08554165	4.08043978	26.047575
0.66857573	-0.72298718	4.04904435	25.303683
0.72843136	0.32558496	4.08996898	25.395330
1.73125420	0.09395495	3.78924735	30.466612

Exercice 74 .

x	y	z	t
1.25324858	0.00874158	3.97413584	33.942178
1.50690174	0.44956876	3.85896348	35.026798
0.90345901	0.64143329	4.01706227	31.932437
1.58728509	-0.23765345	3.84558331	35.656113

Exercice 75 .

x	y	z	t
3.56389945	-1.10255281	1.85673426	4.972427
3.27284542	0.37824994	2.55144545	7.121367
3.31164077	-0.12043986	2.52645874	7.219568
3.28762363	-0.34877399	2.53660238	7.202421

Exercice 76 .

x	y	z	t
-1.18536169	2.58737932	3.04382161	60.219078
-1.28898479	2.53283250	3.04757966	60.217453
-0.65168235	2.01525331	3.58866665	58.775293
-1.09835255	2.49637285	3.15058857	60.069543

Exercice 77 .

x	y	z	t
0.81330254	-2.59108126	3.16058554	12.616314
0.30187735	-2.99440014	2.88216966	12.655922
0.31860220	-2.30899039	3.45420325	11.836262
1.09360334	-3.15003384	2.49915639	12.848745

Exercice 78 .

x	y	z	t
1.75734514	0.93436590	3.66103299	59.979685
2.33800715	-0.06348850	3.44879049	63.261835
0.63200374	-0.98772788	3.99867841	54.936193
0.55399196	0.96124667	4.01666053	54.015828

Exercice 79 .

x	y	z	t
2.48305828	0.92563555	3.21591115	15.956865
3.11897275	-0.38381193	2.73663324	15.499937
2.21697204	1.70922536	3.08675359	14.940376
2.25911773	1.82190084	2.99023887	14.837428

Exercice 80 .

x	y	z	t
2.02691558	-0.51153387	3.60477606	80.712083
1.85561883	-0.58009656	3.68573342	79.887442
1.00437614	0.56428104	4.00465723	75.357964
0.45762513	0.69503508	4.08313232	72.545391

Exercice 81 .

x	y	z	t
1.75645704	1.06079231	3.62685021	11.622719
2.38442488	1.35203368	3.13862820	12.952396
1.43562968	1.95850164	3.38639969	11.351894
2.52138359	1.85086193	2.75343404	13.086594

Exercice 82 .

x	y	z	t
1.59787012	-1.95835465	3.31302313	17.150138
1.23059790	-2.67592232	2.94780132	18.531255
0.58598804	-2.43697774	3.32899708	18.130625
-0.07399645	-2.27144399	3.49278268	17.130268

Exercice 83 .

x	y	z	t
1.33709591	-1.80388936	3.51035921	62.100153
1.22357439	-3.33732684	2.17475960	63.576619
0.38051545	-1.91639572	3.68063847	62.058659
0.84719433	-2.66383664	3.09042072	63.760571

Exercice 84 .

x	y	z	t
-0.78429635	0.73837316	4.02543767	15.374287
-0.53302575	1.00739585	4.00817929	14.594781
0.78869860	0.26709196	4.08302345	19.466973
-0.34049201	0.94397277	4.04443379	15.076868

Exercice 85 .

x	y	z	t
1.53312162	1.28596953	3.65517230	40.153697
2.45399997	1.27994275	3.11513961	41.815810
2.87753608	0.68576325	2.93495808	41.442746
2.36892675	0.70460469	3.35502345	41.089328

Exercice 86 .

x	y	z	t
2.19379052	1.60193236	3.15999366	39.167426
2.21270372	1.30050775	3.28284723	39.053283
2.12862538	1.89846950	3.03796505	39.069523
2.33526202	1.53101039	3.09306039	39.324807

Exercice 87 .

x	y	z	t
1.79498987	0.97507578	3.63203836	19.966140
2.12880434	-0.14996891	3.57912915	19.006257
2.27135329	1.30235387	3.24180393	21.330062
2.81600279	0.62420657	3.00748376	21.554810

Exercice 88 .

x	y	z	t
1.83306618	1.05945867	3.58913357	10.724121
1.81375207	1.05781683	3.59941538	10.660844
2.48257412	1.11834224	3.15445724	12.604843
1.37967051	0.36983826	3.91461276	7.709199

Exercice 89 .

x	y	z	t
0.64116584	-2.10556547	3.53835619	24.112648
0.68125754	-2.56658337	3.21138631	24.983760
0.54740641	-2.11397679	3.54907206	24.070304
1.26319277	-2.74408557	2.87033143	25.173354

Exercice 90 .

x	y	z	t
-0.52873245	-1.83043223	3.70599837	49.282451
0.42784287	-2.11064801	3.56743319	50.722099
0.19483628	-1.99716583	3.65209961	50.219592
0.96673678	-1.90807499	3.57618986	49.657057

Exercice 91 .

x	y	z	t
3.12169047	0.92504921	2.60073003	0.584040
2.29006396	0.23091147	3.47372293	0.620702
2.79722176	0.74039404	2.99863822	0.954162
2.31014321	0.41321939	3.44339254	0.713491

Exercice 92 .

x	y	z	t
2.94888034	1.36026629	2.61117683	21.348175
2.17539682	1.34396137	3.29027060	20.873641
2.27802962	1.20903048	3.27311632	20.921388
2.29833942	1.16185499	3.27600259	20.908404

Exercice 93 .

x	y	z	t
2.43907861	-0.85239170	3.26937120	49.368479
3.23328564	-0.04991104	2.62827642	49.249310
3.23382355	0.51151970	2.57782795	48.916062
2.95215070	-1.18097226	2.69343180	48.568478

Exercice 94 .

x	y	z	t
0.51967802	1.92177598	3.66076166	52.133978
-0.26919251	2.09524608	3.59192753	51.971754
-0.07996640	1.65616745	3.82298036	50.473008
1.29638655	1.73712660	3.55896575	51.733099

Exercice 95 .

x	y	z	t
2.27337614	0.89800014	3.37488085	68.876955
2.03109044	-0.80333829	3.54877208	68.860072
2.16656094	-0.53570019	3.51902019	69.357190
2.54799372	-0.89122655	3.17457199	70.098845

Exercice 96 .

x	y	z	t
2.16413039	0.88812438	3.44851255	29.466530
3.04755781	0.85731636	2.70958745	29.710654
3.24156071	0.78118630	2.49929915	29.469187
2.22430717	0.74460203	3.44419650	29.590996

Exercice 97 .

x	y	z	t
1.77616937	-0.84280681	3.67414795	54.372329
1.44853780	-0.25531481	3.89884812	52.735013
1.65421507	0.21899798	3.81838663	53.612598
0.15925400	0.00873312	4.16401561	46.192611

Exercice 98 .

x	y	z	t
0.30666513	0.17923396	4.15190267	60.849639
-0.51504654	0.47369430	4.10789543	58.506297
0.32173715	1.79473430	3.74698253	54.448600
-0.56466633	0.67569409	4.07296618	57.617344

Exercice 99 .

x	y	z	t
0.76494844	1.83158898	3.66395958	26.124205
1.56293167	2.36964679	3.05065285	24.411327
1.33022175	1.81818711	3.50559122	25.771979
1.30708925	0.95689072	3.83931529	28.240359

Exercice 100 .

x	y	z	t
0.40937273	1.23460128	3.95886824	5.608829
-0.23143039	0.42297443	4.13908162	8.011026
-0.13844334	-0.12011441	4.16303616	10.475831
-0.27436066	0.92675657	4.05343220	5.901472

Solutions

Exercice 1 . alhambra(grenade)

Exercice 2 . petra

Exercice 3 . christ-redempteur

Exercice 4 . basilique-sainte-sophie

Exercice 5 . christ-redempteur

Exercice 6 . ile-de-paques

Exercice 7 . tombouctou

Exercice 8 . colisee

Exercice 9 . tour-eiffel

Exercice 10 . christ-redempteur

Exercice 11 . christ-redempteur

Exercice 12 . basilique-sainte-sophie

Exercice 13 . kremlin

Exercice 14 . alhambra(grenade)

Exercice 15 . kremlin

Exercice 16 . christ-redempteur

Exercice 17 . chichen-itza

Exercice 18 . chateau-neuschwanstein

Exercice 19 . machu-pichu

Exercice 20 . basilique-sainte-sophie

Exercice 21 . taj-mahal

Exercice 22 . grande-pyramide

Exercice 23 . ile-de-paques

Exercice 24 . statue-liberte

Exercice 25 . petra

Exercice 26 . acropole

Exercice 27 . grande-muraille

Exercice 28 . chichen-itza

Exercice 29 . acropole

Exercice 30 . taj-mahal

Exercice 31 . angkor

Exercice 32 . chateau-neuschwanstein

Exercice 33 . alhambra(grenade)

Exercice 34 . grande-pyramide

Exercice 35 . kremlin

Exercice 36 . christ-redempteur

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Exercice 38 . petra

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Exercice 41 . opera-sydney

Exercice 42 . opera-sydney

Exercice 43 . grande-muraille

Exercice 44 . grande-muraille

Exercice 45 . ile-de-paques

Exercice 46 . statue-liberte

Exercice 47 . chateau-neuschwanstein

Exercice 48 . statue-liberte

Exercice 49 . petra

Exercice 50 . petra

Exercice 51 . alhambra(grenade)

Exercice 52 . petra

Exercice 53 . chateau-neuschwanstein

Exercice 54 . kremlin

Exercice 55 . grande-muraille

Exercice 56 . alhambra(grenade)

Exercice 57 . tour-eiffel

Exercice 58 . machu-pichu

Exercice 59 . taj-mahal

Exercice 60 . acropole

Exercice 61 . angkor

Exercice 62 . acropole

Exercice 63 . grande-pyramide

Exercice 64 . tombouctou

Exercice 65 . tour-eiffel

Exercice 66 . stonehenge

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Exercice 69 . opera-sydney

Exercice 70 . grande-muraille

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Exercice 73 . tombouctou

Exercice 74 . tombouctou

Exercice 75 . stonehenge

Exercice 76 . grande-muraille

Exercice 77 . statue-liberte

Exercice 78 . tombouctou

Exercice 79 . colisee

Exercice 80 . tombouctou

Exercice 81 . basilique-sainte-sophie

Exercice 82 . statue-liberte

Exercice 83 . statue-liberte

Exercice 84 . machu-pichu

Exercice 85 . basilique-sainte-sophie

Exercice 86 . basilique-sainte-sophie

Exercice 87 . acropole

Exercice 88 . grande-pyramide

Exercice 89 . statue-liberte

Exercice 90 . chichen-itza

Exercice 91 . chateau-neuschwanstein

Exercice 92 . basilique-sainte-sophie

Exercice 93 . stonehenge

Exercice 94 . taj-mahal

Exercice 95 . alhambra(grenade)

Exercice 96 . chateau-neuschwanstein

Exercice 97 . tombouctou

Exercice 98 . machu-pichu

Exercice 99 . ile-de-paques

Exercice 100 . machu-pichu