

DSC520_Week11

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2023-11-10

Download data:

```
binary_data <- read.csv(file = "binary-classifier-data.csv")
head(binary_data)
```

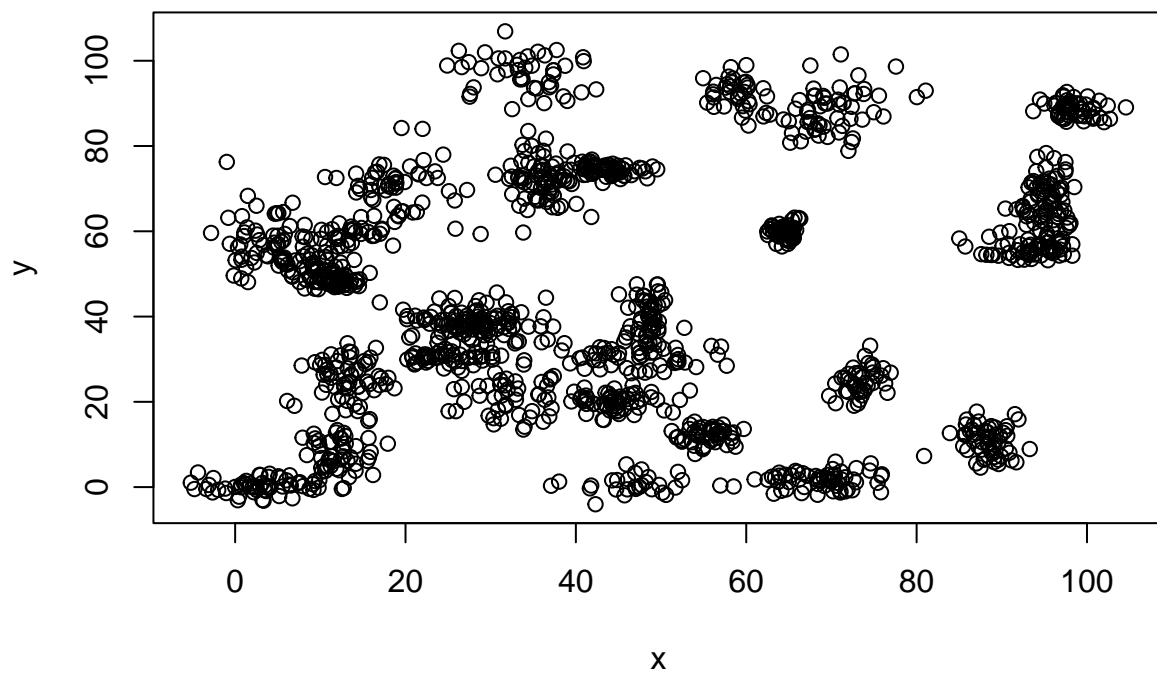
```
##   label      x      y
## 1     0 70.88469 83.17702
## 2     0 74.97176 87.92922
## 3     0 73.78333 92.20325
## 4     0 66.40747 81.10617
## 5     0 69.07399 84.53739
## 6     0 72.23616 86.38403
```

```
trinary_data <- read.csv(file = "trinary-classifier-data.csv")
head(trinary_data)
```

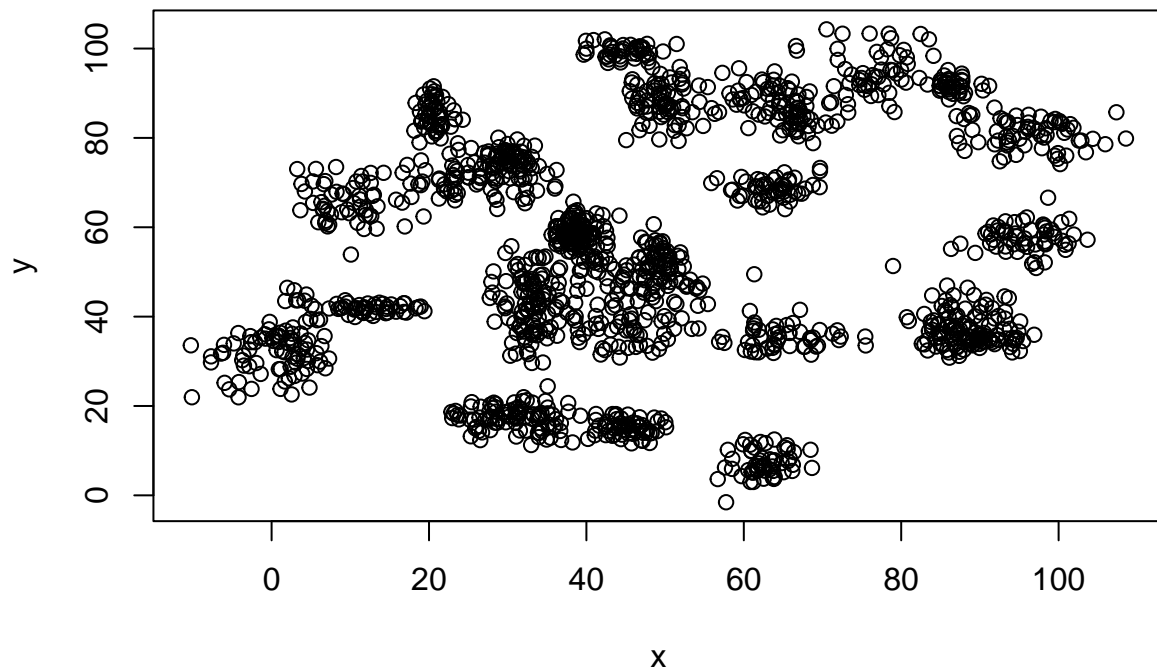
```
##   label      x      y
## 1     0 30.08387 39.63094
## 2     0 31.27613 51.77511
## 3     0 34.12138 49.27575
## 4     0 32.58222 41.23300
## 5     0 34.65069 45.47956
## 6     0 33.80513 44.24656
```

Plot the data from each dataset using a scatter plot.

```
plot(y ~ x, data = binary_data)
```



```
plot(y ~ x, data = trinary_data)
```



In this problem, you will determine which points are nearest by calculating the Euclidean distance between two points.

```
binary <- c(70.88469, 83.17702)
trinary <- c(30.08387, 39.63094)
euclidean <- function(a,b) sqrt(sum(a-b)^2)
euclidean(binary, trinary)
```

```
## [1] 84.3469
```

Fit a k nearest neighbors' model for each dataset for k=3, k=5, k=10, k=15, k=20, and k=25. Compute the accuracy of the resulting models for each value of k.

```
diff(binary_data$x, differences = 3)
```

```
## [1] -0.91191708 16.22980623 -9.54674085 -4.96883252 12.43362138
## [6] -19.42813970 12.56637759 0.79264977 3.82988325 -12.69816014
## [11] 14.42022985 -13.47615042 6.24076090 -2.60750545 10.05410984
## [16] -6.75708487 -9.90904735 11.76636205 3.56710960 -16.30262886
```

##	[21]	13.99845131	6.51094633	-27.01325173	23.33605370	1.47804158
##	[26]	-27.28795701	30.52277000	-8.41871070	-4.45650719	-6.00029532
##	[31]	17.55157575	-19.65019137	18.57022444	-19.31872977	27.64811634
##	[36]	-42.86371020	34.49995179	-1.80869148	-6.38168969	-6.98225174
##	[41]	1.82487395	12.27016655	-10.01587522	7.33197226	-4.14947596
##	[46]	-16.70262927	21.40137170	-0.61496258	-11.62358284	13.50313289
##	[51]	-14.58829463	15.78350377	-35.70620602	50.83609876	-24.09568182
##	[56]	1.74369099	-3.58218591	3.99905099	-2.58228313	2.02820797
##	[61]	-2.81036017	6.19699618	-8.04570222	4.26126425	-0.35947402
##	[66]	-1.72861135	4.66039321	-6.40411224	6.08421229	-4.43830128
##	[71]	-0.81653275	6.37957258	-8.05066358	9.20546641	-8.59057131
##	[76]	4.68313742	-1.19960125	-0.48858040	-3.23416000	10.98999437
##	[81]	-12.02571812	7.27665735	-5.07194589	3.68989093	-3.35171312
##	[86]	7.34950493	-9.86368408	6.34507060	-2.20364680	0.76421609
##	[91]	2.59439022	-4.60372728	-0.63727553	4.85554670	-3.31654640
##	[96]	-6.41479973	20.98474234	-22.67952625	9.65271291	-1.58888300
##	[101]	5.44047953	-0.57807016	-16.08272215	20.10814744	-9.61408955
##	[106]	2.47868401	1.88720861	-2.92261603	-7.15367027	13.49050846
##	[111]	-13.16347342	16.79229619	-16.53790179	6.87007679	6.67339810
##	[116]	-10.04523954	7.59830497	-14.49346569	15.80702586	-6.35078016
##	[121]	-1.50899689	6.29063248	-10.20413655	14.78209536	-15.18321602
##	[126]	6.87751948	2.95767754	-2.52203342	-6.32649100	15.98758935
##	[131]	-16.55402177	0.98895591	9.29512036	-5.44786765	3.24100667
##	[136]	-0.18613585	-5.26063180	-0.03431786	12.85663487	-16.84814065
##	[141]	10.48521055	-1.84263336	-0.62459919	-4.08927482	10.76711722
##	[146]	-17.52465540	18.39046653	-9.53957119	-1.68173453	2.31353848
##	[151]	4.47259011	-2.43240190	-9.02140956	17.69543260	-13.76522297
##	[156]	6.48359413	-2.94490668	48.34775477	-103.00933553	66.14511969
##	[161]	-20.63797615	16.41294965	-15.13711475	15.07448052	-10.14356810
##	[166]	8.13920684	-8.17679567	-5.93981319	25.06423212	-23.59837015
##	[171]	12.42006962	-8.76051803	1.33186028	9.58658325	-7.21263346
##	[176]	-5.39201990	8.11592067	0.37197041	-6.50920900	7.25446522
##	[181]	-6.78888131	7.93188470	-9.55109433	8.67562627	-1.70663092
##	[186]	-4.26486882	4.07303733	-5.62172763	5.50962891	2.52287144
##	[191]	-8.37380490	4.80082023	-0.40029601	-82.37172251	167.29666166
##	[196]	-93.30177441	16.02396268	-15.21912111	18.33284314	-22.74418905
##	[201]	21.39315308	-15.08347803	6.26267170	-1.07818482	1.79128365
##	[206]	-5.67401518	13.58622076	-9.66270534	-13.63740345	28.14749100
##	[211]	-23.20217150	13.77990609	-7.80813387	8.70767492	-7.36458571
##	[216]	-13.47875579	39.02048573	-34.80835092	9.67650158	46.16348326
##	[221]	-89.61794511	44.09784943	2.20115269	-2.51575604	3.94626785
##	[226]	-4.60947013	-1.74842617	4.68918906	1.52944571	-4.22867399
##	[231]	-1.17131504	6.86285826	-5.60983729	3.42175080	-11.75987064
##	[236]	15.72798517	1.41347054	-13.83202770	5.18857814	-0.99653234
##	[241]	0.72050177	8.02791848	-12.39603703	10.97294151	-5.74483354
##	[246]	-1.62730453	-1.25659532	10.76773891	-8.43505506	-3.54479367
##	[251]	6.38430459	-2.40142011	2.12467048	-2.16212034	-1.16380771
##	[256]	6.37134980	-20.31040776	27.13872675	-5.92688406	-15.88810404
##	[261]	19.31614763	-7.63585026	-7.32002057	7.85435804	-3.76750375
##	[266]	10.72823108	-13.94356177	8.43145571	-13.28429654	16.97542972
##	[271]	-7.84156206	0.70943168	2.14490990	-3.05475340	5.59931068
##	[276]	-12.93459306	7.82883962	8.82359236	-13.70283579	10.81220643
##	[281]	-14.56253374	22.12432011	-22.14019972	10.44365779	-3.17531837
##	[286]	6.02871086	-2.39104681	-7.81738926	10.29317564	0.25225603

##	[291]	-8.33211391	-0.34627384	0.95235965	15.15665443	-18.29808483
##	[296]	15.42705383	-19.46010373	11.78930363	13.01053588	-27.55852474
##	[301]	11.13035737	0.49492650	6.93658937	-4.45485277	-3.67276541
##	[306]	8.76246795	-13.13917393	6.38746545	10.22935085	-14.78661300
##	[311]	-35.64335481	92.47057402	-67.33883284	21.88860741	-0.31405410
##	[316]	-16.94692512	16.66981145	-3.91977334	-2.54957544	0.26266747
##	[321]	2.95665533	-8.77966877	18.85217293	-25.98989575	25.86562696
##	[326]	-19.83354954	4.36851040	16.15746034	-12.80323377	-20.97847542
##	[331]	45.01653484	-33.32648673	2.39798387	15.58075815	-12.07253732
##	[336]	12.85504745	-25.89822626	20.43486360	10.19459106	-21.66922839
##	[341]	-1.47582552	18.00642493	-14.27611517	15.23655709	-22.46845977
##	[346]	17.05563504	0.46258511	-4.85769166	-11.75759780	22.02562925
##	[351]	-14.13465512	3.93049930	4.16231692	-15.94741705	24.65005695
##	[356]	-17.25947890	-1.04761330	8.69325694	4.72261187	-19.12605797
##	[361]	12.25931135	0.95719712	-0.15610476	-7.05753847	4.30635340
##	[366]	1.34210525	85.46044902	-170.36314634	83.84091197	2.09756369
##	[371]	-3.48046565	0.76043988	2.18868884	0.33004562	0.17123582
##	[376]	-6.45541306	6.85117201	-6.36409577	8.22507679	-1.65129402
##	[381]	-8.97458421	13.38104952	-10.31389450	6.71130716	-7.62043040
##	[386]	5.51279288	4.24394389	-12.99772399	11.95892580	-4.15528572
##	[391]	-0.40754601	0.15184784	-3.03525893	7.98158819	-3.80567835
##	[396]	-5.06704650	5.07931715	-6.08207042	15.35650270	-18.40869816
##	[401]	19.26380715	-24.19163355	19.43541133	-8.24234190	4.95661648
##	[406]	-9.26933910	12.44308064	-7.12226280	-2.23466926	4.32743786
##	[411]	-3.18001152	10.13199514	-19.83906331	12.67112563	9.73150349
##	[416]	-12.10026386	-4.05163753	2.01205871	9.29628956	-5.07561425
##	[421]	-6.82287197	12.16912175	-7.81601712	3.65957374	-68.57754983
##	[426]	125.59329093	-55.27935342	-9.26075778	18.87566124	-13.87553224
##	[431]	-6.77914019	4.61925827	3.16278977	6.18262143	-10.60374255
##	[436]	-3.93421997	26.17051624	-28.38731736	11.48294483	-4.48635200
##	[441]	14.07793310	-31.89866913	31.45825278	-7.68854624	3.36845023
##	[446]	-17.89249943	18.17819279	-12.59541787	5.04403543	7.08067088
##	[451]	0.96640765	-24.30593305	37.49178370	-43.23529375	37.78313930
##	[456]	-19.59346154	5.47370068	2.96104164	-7.46158303	5.79032742
##	[461]	0.88658893	-11.44674417	8.35674584	14.41000674	-18.52240567
##	[466]	-8.46631690	31.63893276	-36.70051573	25.18374640	2.25640489
##	[471]	-19.61323975	10.86620620	-2.21557619	3.21556213	-4.28057957
##	[476]	-12.51646470	31.18709516	-14.68489926	2.99888798	-12.01820351
##	[481]	10.78188272	-12.21539708	32.67644057	-45.35981965	29.08032668
##	[486]	-6.16628330	-3.01317592	6.12134084	-7.29538690	-4.11451657
##	[491]	11.50686777	-1.41610829	-6.63984943	7.87470553	-8.76378475
##	[496]	3.53635621	2.81325636	5.78139044	-15.70821030	14.91314871
##	[501]	-15.66864616	14.11462918	-4.79676675	-11.05174404	28.99869440
##	[506]	-31.05916219	13.62568239	-2.38906074	12.18963999	-25.83454637
##	[511]	18.76431888	11.31825987	-26.50520531	8.17507072	7.91335413
##	[516]	-12.54823804	14.53693812	-3.41952567	-5.03075273	1.75843858
##	[521]	-3.34434243	0.56775279	12.27718871	-13.09335625	11.47910319
##	[526]	-25.20453741	33.55685711	-25.95511669	102.42007186	-180.50110109
##	[531]	81.62141702	15.29830987	-19.46240629	16.69346045	-3.79208634
##	[536]	-8.75669116	11.01229784	-8.20909186	6.67480876	-6.27405033
##	[541]	6.36275985	-6.10685031	4.25030649	-1.73289521	-0.67881692
##	[546]	1.51115013	-0.80527712	2.36784617	-5.14788444	6.08556805
##	[551]	-6.98201017	6.10035126	-1.32962460	-1.67895547	-0.20333756
##	[556]	5.76258773	-9.21251676	5.48909771	-0.75249785	0.63595764

##	[561]	-2.27357594	1.87152862	-2.55859821	3.14337647	-0.19092511
##	[566]	0.62247924	-3.29702384	2.90929754	-0.25384427	-5.63893225
##	[571]	9.55068917	-8.29986517	-56.34016283	126.72598408	-72.36821068
##	[576]	-4.35077271	31.28161473	-37.79560482	19.32861883	2.73331104
##	[581]	-4.97623462	-14.20151829	27.62680830	-15.70430076	-7.89336565
##	[586]	30.50804378	-43.10652337	27.52817016	2.64878614	-13.58093456
##	[591]	3.65930729	-1.89066391	6.69312747	3.37475957	-13.01250626
##	[596]	10.65396146	-10.91787215	16.89427957	-12.80627578	5.15084606
##	[601]	-8.82164979	6.08378810	-3.43449629	18.45206584	-25.12469900
##	[606]	14.56667903	-7.55211029	11.65054779	-19.31372388	17.10275149
##	[611]	-10.74199115	11.33167527	-1.88318913	-9.31216496	-10.17645956
##	[616]	34.19789679	-25.24423647	7.16462929	-9.02635561	15.54051237
##	[621]	-28.77210164	37.61379893	-14.12922884	1.45708156	-8.58838612
##	[626]	2.86239051	-1.41303046	11.30460867	-7.90898365	-13.48758561
##	[631]	27.37832249	-13.56609328	-2.15878735	-4.25899459	5.17954918
##	[636]	6.90957125	-8.34439105	-0.18338310	1.55668916	7.03074257
##	[641]	-5.33519315	-9.90672229	16.48828619	-8.83900576	-2.15875935
##	[646]	5.78963064	-0.31725720	-5.55448277	3.61106628	-1.40864308
##	[651]	6.80538339	-7.09849846	0.46589091	0.42718098	1.10885553
##	[656]	-1.66166478	6.79906512	-10.67687635	5.45367077	0.85604386
##	[661]	4.16115032	-15.31126729	15.85165121	-12.53246352	18.05415509
##	[666]	-10.47443844	-16.50055370	29.80598096	-21.38300303	8.07302903
##	[671]	1.73815528	-4.05991192	5.71066607	-5.84468958	-15.04343981
##	[676]	25.87842016	3.88065439	-24.67431908	16.33397803	-2.73512860
##	[681]	-5.39605819	3.04160168	2.73582321	-9.13346930	12.24007867
##	[686]	-4.25702629	-7.02731512	9.44775007	5.02236737	-26.13829098
##	[691]	34.88118977	-35.80309851	31.43094431	-19.11036220	9.94271849
##	[696]	-1.71126825	-11.07482981	21.73733634	-25.42105340	21.08865006
##	[701]	-11.53350743	0.90105090	1.59725282	3.12498557	-3.76332494
##	[706]	0.51856166	3.42881157	0.50498851	-13.55099731	18.52594017
##	[711]	87.64238323	-193.76873319	93.33704410	6.64798931	2.75576310
##	[716]	-11.89053082	12.24127894	-7.00646902	0.76709083	6.39741867
##	[721]	-14.51176174	11.11889206	4.31605290	-10.71613123	7.31228334
##	[726]	-3.67164476	-2.93860444	8.99285105	-9.53891730	2.86207418
##	[731]	6.40018534	-10.37248352	8.80368256	-6.79033084	10.70883325
##	[736]	-13.96520655	10.46696016	-7.41734494	6.47723610	-6.92294847
##	[741]	6.55601375	-2.47591540	5.89016304	-16.82976840	16.64410556
##	[746]	-8.52250412	7.09514737	-9.51699278	7.17056937	2.13968747
##	[751]	-12.23418212	13.63187120	-8.20235268	7.02628605	-6.89469837
##	[756]	-1.29246385	8.75423408	-7.23431200	6.11551007	-14.11066129
##	[761]	21.35654744	-14.99576718	3.26876828	8.28527526	-99.47688437
##	[766]	174.56586762	-79.07193508	-9.15249612	15.44219110	-27.71820170
##	[771]	37.38352133	-34.37476008	28.67803487	-24.30640303	19.14742184
##	[776]	-10.00628438	-8.43053915	18.26086617	-21.20157995	29.07284301
##	[781]	-30.44486981	25.40989581	-17.67742550	4.71948832	9.47271508
##	[786]	-9.56390092	-7.41219057	21.47716460	-20.49071055	5.09133399
##	[791]	16.97800717	-22.03898523	-4.43119692	25.25279146	-10.59915401
##	[796]	-10.49170847	9.07905268	8.05248123	-14.17403347	2.72988375
##	[801]	4.94584009	6.34901126	-18.75711112	7.04394797	4.95728472
##	[806]	1.63826989	-4.94667181	4.32493552	-5.59545141	2.58212703
##	[811]	3.28677594	-8.60332093	3.68050817	9.91531303	-6.76647943
##	[816]	16.06277950	-39.95324726	21.01565803	6.93832152	-16.38553994
##	[821]	21.41382755	-18.80221591	11.68290713	-3.96941435	0.76324446
##	[826]	14.06075502	-33.89855838	16.94380586	13.71939865	-17.33446866

##	[831]	15.81193604	-27.08154697	42.65652219	-29.65800872	-7.79389267
##	[836]	7.09010173	13.31077718	-4.20092800	-5.33908418	-3.06943820
##	[841]	1.54048214	13.82730431	-5.82395940	-16.87410729	10.32322670
##	[846]	9.67255812	-7.57006793	-5.32718919	1.42411538	7.15015104
##	[851]	-4.90781760	3.37672839	4.30627023	-14.02986183	-1.32104347
##	[856]	18.91418715	-19.47150318	23.52274567	-15.79108847	-15.30615089
##	[861]	38.82500641	-34.00664672	17.37985829	-20.26224695	35.87835758
##	[866]	-27.76169107	-2.73092733	25.85260225	-39.06804273	41.63545227
##	[871]	-30.09666666	29.93452707	-35.62435560	14.34724582	4.73884504
##	[876]	1.51288866	-7.29437008	17.92752782	-29.01525263	27.08286571
##	[881]	-23.63872802	16.73995549	-5.92091846	1.99803398	-5.34437647
##	[886]	5.16199102	2.34274994	-5.18628844	0.55424377	2.90236538
##	[891]	-10.00012667	21.21153164	-24.54640141	12.72808009	8.75213524
##	[896]	-19.56032196	13.70864033	-11.71201697	15.92487209	-9.84308872
##	[901]	-1.89228044	3.47744728	0.37089721	4.21868406	-11.07851928
##	[906]	11.01177645	-4.67892268	-3.03560267	-3.17965412	22.59138342
##	[911]	-37.59597916	40.16011714	-20.21706442	-12.73086711	26.18263100
##	[916]	-15.70531763	6.97408456	-16.52357704	26.13698006	-17.87888908
##	[921]	6.22426513	-6.40572602	12.06789075	-4.26712163	-11.48718839
##	[926]	4.97293257	16.16505895	-20.99134320	17.61665728	-18.20356534
##	[931]	12.08476908	64.14198276	-139.09548952	79.91420772	-10.59129916
##	[936]	0.06901227	4.41682476	-6.06449205	18.12301798	-24.87804493
##	[941]	5.19870000	15.56307861	-15.54011419	14.62063493	-16.46010077
##	[946]	10.90883599	-2.97918500	-5.78108239	9.83352486	-6.64687591
##	[951]	9.82252932	-15.42113998	10.40569683	-3.09758512	-0.45529671
##	[956]	4.35844463	-6.54234719	1.44162526	-0.84549268	15.00411760
##	[961]	-21.57050057	11.78458696	-0.69357588	-5.75143110	0.22621679
##	[966]	5.31243976	11.07848235	-27.91697880	25.63639819	-21.62898198
##	[971]	19.78575989	-10.90527021	-1.89671041	10.78218407	-6.16608431
##	[976]	-1.94253340	-13.01523530	37.32491839	-35.88392346	18.29288701
##	[981]	-18.52298108	32.06092870	-26.72287491	-57.54284177	134.81647396
##	[986]	-74.41824084	-0.30502585	16.18641076	-17.99716631	10.16610361
##	[991]	-7.87416649	21.11491275	-31.47552523	23.03492694	-22.24018655
##	[996]	29.28079693	-24.56205263	23.64489025	-26.92810374	21.77955341
##	[1001]	-17.93846795	12.47311873	1.27084026	-12.87982572	29.77821029
##	[1006]	-44.66108133	27.86569495	-8.77906719	20.20263343	-34.43743738
##	[1011]	33.83199871	-20.24182735	-2.41909719	26.99456986	-47.52606815
##	[1016]	36.64868222	-4.27711500	2.02227429	-10.31350967	-9.18931052
##	[1021]	37.42644177	-57.39939884	59.09559573	-46.42566723	38.81465915
##	[1026]	-26.22272802	9.16710023	-3.25968996	3.39292681	2.12379587
##	[1031]	-10.49341056	10.61050752	-4.53324998	-9.40579883	13.19463163
##	[1036]	4.74391369	26.06597775	-72.47224975	39.51877982	-1.41640399
##	[1041]	-0.68853069	0.72448645	1.77800295	0.03591059	-3.07727567
##	[1046]	0.78805207	1.60116314	-3.11812317	4.34294689	-3.31837499
##	[1051]	0.99388090	3.67927345	-6.66901692	3.53959866	1.04809928
##	[1056]	-2.51846297	1.74238058	-0.38281107	-2.24676766	3.53405567
##	[1061]	0.22714398	-5.30074676	6.82467097	-5.61177206	3.79941328
##	[1066]	-1.16034842	0.49680963	-2.38783004	0.78092380	0.91321194
##	[1071]	2.09871301	-3.73814700	0.36533766	4.76108344	-6.76353272
##	[1076]	4.82081243	-1.27768679	-1.06589174	0.24592470	0.56676964
##	[1081]	-1.44507300	2.36301981	1.32080699	-2.77934769	-3.63917635
##	[1086]	7.25637033	-3.02910174	1.25897807	-4.34096941	5.41667447
##	[1091]	-3.51629162	-0.72099835	9.11709950	-9.77320875	1.68054628
##	[1096]	-5.50350516	14.08674614	-14.78139100	10.91777631	-8.62318146

## [1101]	6.50284470	2.72671246	-10.07031809	9.93190878	-4.93386916
## [1106]	-2.84297732	6.22470929	-2.20478863	-4.99272919	7.18514241
## [1111]	-0.35193597	-9.35342888	10.20596070	-2.61102780	-0.09198440
## [1116]	-0.61894960	-2.38820617	4.11405446	-3.36458904	1.88693382
## [1121]	-0.95725782	4.27148378	-2.12804420	-6.55663508	3.15404002
## [1126]	5.37297094	-0.97447340	-6.11862380	3.26969244	4.57998008
## [1131]	-8.62174651	5.53329584	0.91553933	-40.20088416	85.54737135
## [1136]	-48.66490831	-17.09758558	19.00704140	10.67469901	-13.31603195
## [1141]	-0.95770314	2.76443660	7.55687943	-11.93776779	6.92956172
## [1146]	-6.63269576	7.27027465	-7.18281423	4.08179082	-0.47962360
## [1151]	4.59208392	-3.73390486	-1.46588321	-8.80649241	24.66076217
## [1156]	-14.20921782	-4.34526557	0.34906139	11.89487977	-20.27276077
## [1161]	19.13051520	15.06789269	-45.01958820	24.47758011	-8.60022676
## [1166]	11.27821115	-10.72638916	19.42634240	-27.18539203	26.04715271
## [1171]	-15.89121178	8.11147981	-26.91294684	48.40720692	-31.50507606
## [1176]	1.00103626	11.20717577	-15.48295813	21.34081345	-17.88336432
## [1181]	4.75123386	4.69477080	-7.98806899	-4.86586369	27.18321431
## [1186]	-36.97747646	26.12436268	-0.01984956	-8.97537389	-3.50668454
## [1191]	6.19791296	0.84985831	-1.02937716	-8.18937140	11.98289242
## [1196]	-4.15760760	1.14514572	-0.23886585	1.47134546	-11.79389560
## [1201]	8.03700289	13.38965176	-15.76906234	-9.31292418	23.96383581
## [1206]	-10.54849384	-5.31912153	2.87797287	10.74025844	-18.70002457
## [1211]	15.99278075	-16.63665954	22.36308002	-15.28069181	4.20419043
## [1216]	-8.18020133	10.77560890	-5.14283880	6.06843780	-20.16581574
## [1221]	23.76441536	-0.59349611	-12.46580730	11.76356376	-13.63790314
## [1226]	9.59890002	-2.17155848	-5.09508878	12.68433768	-14.04532708
## [1231]	5.94775375	5.60819190	-16.74615784	23.19864675	-19.80110133
## [1236]	3.82977723	15.41395508	-18.82215834	10.36882291	-8.94122081
## [1241]	10.34462200	-7.95988671	8.22518857	-8.08950230	6.78741286
## [1246]	-8.24034488	7.58539124	-2.17263838	-6.11918263	8.05051018
## [1251]	2.38800354	-8.08534274	0.72764103	3.53291602	-3.17801153
## [1256]	6.91163730	-10.13211756	13.00187818	-17.92469982	12.70307161
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## [1271]	-3.04046246	-1.72757895	0.08142975	-4.86210634	23.61621573
## [1276]	-30.31553341	10.32915731	6.62393316	-6.36468448	8.05119719
## [1281]	-9.52516778	-0.94529248	8.25544694	-4.88805657	2.52834023
## [1286]	-2.66346038	3.51140393	-5.72934255	4.23356249	-3.90772728
## [1291]	4.80590572	9.21583743	-32.14803259	36.15122163	-17.98533415
## [1296]	4.20249609	-6.80523056	12.84581400	-9.19391789	2.37493636
## [1301]	-6.90114782	10.42593459	-0.01536857	-8.70696137	6.73864083
## [1306]	-3.40161656	1.74207891	2.51617945	-4.70366629	3.46220899
## [1311]	-5.97019482	10.57353326	-10.46556774	4.25909818	-0.69279910
## [1316]	3.14616341	-8.94949942	15.63689611	-11.96533319	3.83407923
## [1321]	-5.40315649	7.62116481	-6.83411179	8.61332363	-1.66740029
## [1326]	-15.14660247	17.93371589	-4.68023803	-1.54655194	-1.54697585
## [1331]	-1.00999271	6.55645515	-2.69851926	-5.15480289	11.80635728
## [1336]	-18.89415425	19.77906253	-12.70009915	4.15103053	-1.66361283
## [1341]	-18.02749157	43.03599350	-27.43866928	7.97936460	-10.74038141
## [1346]	12.46777772	-5.97321854	-4.77094890	10.67497512	-5.84593127
## [1351]	-0.44846598	-0.32665102	-0.36453891	1.80299266	3.20999916
## [1356]	-13.26985925	20.62537701	-19.07611557	12.47242439	-4.93250093
## [1361]	-0.45387211	1.25396294	-2.05631043	3.27095150	-4.45877974
## [1366]	11.30802687	-18.43343941	15.44458224	-6.53532520	2.25472460


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## [1371] -3.35249738 3.01915410 0.06814019 -0.35669292 -3.75504703
## [1376] 3.69585657 2.02929964 -5.71936532 2.09949217 10.52057354
## [1381] -15.77219817 4.52381163 6.69917833 -8.95478069 3.44638151
## [1386] 4.17303831 -5.04627922 -1.90192820 10.36253710 -11.12708727
## [1391] 6.28620549 -9.55059863 15.45699571 -9.09671370 -1.14374432
## [1396] 6.92476908 -11.00987359 8.70859336 1.03574969 -6.76015313
## [1401] 1.97948629 5.78652751 -7.99891044 6.02224198 -6.85206915
## [1406] 8.03079897 -6.92391609 9.63561808 -12.07453859 8.36842586
## [1411] -0.48011383 -5.00682599 0.23115419 3.55340327 3.82484985
## [1416] -4.90778521 -10.27395706 21.47961534 -15.33739798 9.25663517
## [1421] -12.05206931 10.74693129 -7.25202076 13.41222674 -18.66055023
## [1426] 4.49145614 12.51149656 -11.44156722 9.04864834 -13.29619635
## [1431] 10.59862255 -6.95815996 9.56463085 -13.57253829 20.85606233
## [1436] -19.46795287 6.11728984 -0.35323540 1.36131275 0.65931283
## [1441] -7.01411386 10.07562153 -3.96752773 0.44234801 -4.23154931
## [1446] 12.16468055 -18.68069155 11.81585784 -3.51023652 6.65455482
## [1451] -1.16824537 15.50913812 -46.97425899 20.77921648 29.06822700
## [1456] -45.83950252 36.62090770 -16.43244659 9.61004901 -15.41855861
## [1461] 5.70047787 20.31742320 -29.47344786 14.05804620 -0.30615143
## [1466] 4.31874518 -11.52380023 5.24601135 6.63327908 -7.98712666
## [1471] -8.63416896 27.03430601 -24.96586109 17.64684028 -15.39050588
## [1476] -3.35880882 26.65654572 -33.19040668 33.57388744 -20.19901593
## [1481] -4.86179331 5.09856477 22.05500492 -37.58282679 25.07919942
## [1486] -16.20164074 29.41809384 -44.76682255 42.87149160 -19.11169834
## [1491] -14.19324591 36.43387881 -28.63185777 3.54146230 0.89222545
```

```
diff(binary_data$x, differences = 5)
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```
## [1] -42.9182704 30.3544554 12.8245456 -49.2642150 63.8562784
## [6] -43.7682451 14.8109613 -19.5652769 43.6464334 -55.0147703
## [11] 47.6132916 -28.5651777 21.5098816 -29.4728100 13.6592322
## [16] 24.8273719 -29.8746619 -11.6704860 50.1708186 -37.7885852
## [21] -26.0366931 83.8735035 -72.2073176 -6.9079865 86.5767256
## [26] -96.7522077 42.9036842 -5.5059916 25.0956592 -60.7536382
## [31] 75.4221829 -76.1093700 84.8558003 -117.4786726 147.8754885
## [36] -113.6723053 31.7356451 3.9724362 9.4076877 1.6381669
## [41] -32.7313344 39.6338892 -28.8292957 -1.0717051 50.6571543
## [46] -60.1203353 11.0077140 36.1353360 -53.2181433 58.4632259
## [51] -81.8615082 138.0320146 -161.4740854 100.7711534 -31.1652497
## [56] 12.9071138 -14.1625710 11.1918252 -9.4490592 13.8459245
## [61] -23.2500547 26.5496649 -16.9277047 3.2516009 7.7581419
## [66] -17.4535100 23.5528300 -23.0108381 14.1442821 3.5743368
## [71] -21.6263415 31.6863662 -35.0521677 31.0697465 -19.1564474
## [76] 6.5937595 -3.4566005 16.9697340 -37.2398669 42.3180880
## [81] -31.6509787 21.1104401 -15.8034409 17.7428221 -27.9144071
## [86] 33.4219437 -24.7574721 11.5165803 -1.1376888 -9.0282916
## [91] 11.1645692 1.5263705 -13.6649153 5.0738398 30.4977954
## [96] -71.0638107 75.9965078 -43.5738351 18.2709584 -13.0479122
## [101] -9.4861023 51.6955216 -65.9131066 41.8150106 -12.6842490
## [106] -4.2183492 0.5787704 24.8752330 -47.2981606 56.6097515
## [111] -63.2859676 56.7381766 -23.6046573 -16.5219590 34.3621822
## [116] -39.7353152 52.3922622 -52.4582976 26.9995893 2.9578461
## [121] -24.2943984 41.4810009 -54.9515433 52.0260469 -25.9805774
## [126] -1.5598690 1.6752534 26.1185379 -54.8556915 50.0845888
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##	[131]	-9.2368132	-23.0491525	23.4318623	-12.1160168	-1.6473534
##	[136]	10.3008099	7.6646388	-42.5957282	57.0381267	-39.6611951
##	[141]	13.5458781	-4.6827098	18.3210677	-43.1481647	64.2068946
##	[146]	-63.8451597	35.7878744	-3.8625636	-1.8362214	-9.0640436
##	[151]	0.3159843	33.3058498	-58.1774977	51.7094727	-29.6773179
##	[156]	60.7211623	-202.6497518	320.5115455	-255.9375511	123.8340216
##	[161]	-68.6009902	61.7616597	-55.4296439	43.5008236	-34.5987775
##	[166]	18.5529850	28.7670628	-79.6666476	84.6810420	-57.1990274
##	[171]	31.2729660	-1.8376553	-25.0539397	18.6198303	11.6873270
##	[176]	-21.2518908	0.8627709	20.6448536	-27.8070207	28.7641125
##	[181]	-32.2037450	35.7096996	-28.6089778	7.8240193	10.8961441
##	[186]	-18.0326711	20.8261215	-14.1181140	-7.9099189	24.0713015
##	[191]	-18.3757414	-76.7703103	331.6398107	-510.2668202	369.9241732
##	[196]	-140.5688209	64.7950480	-74.6289964	85.2143743	-80.6139733
##	[201]	57.8227808	-28.6870063	10.2103250	-10.3347673	26.7255348
##	[206]	-42.5091621	19.2742280	45.7595926	-93.1345570	88.3317401
##	[211]	-58.5701175	38.1038487	-32.5880694	9.9580906	58.6134116
##	[216]	-126.3280782	118.3136891	-7.9978708	-172.2684100	269.4972229
##	[221]	-175.6124913	37.1797880	11.1789326	-15.0177619	11.4167819
##	[226]	3.5765713	-9.5973586	-2.5983764	8.8154787	4.9768144
##	[231]	-20.5068689	21.5042836	-24.2132095	42.6694772	-41.8023704
##	[236]	-0.9309836	34.2661041	-25.2057163	7.9021446	5.5903826
##	[241]	-27.7313722	43.7929341	-40.0867536	20.8353041	-3.7468198
##	[246]	11.6536250	-31.2271282	24.0930554	5.0388369	-18.7148230
##	[251]	13.3118153	-8.8128814	5.2851034	6.5368449	-34.2169151
##	[256]	74.1308921	-80.5147453	23.1043908	45.1654717	-62.1562496
##	[261]	27.2678276	14.8585489	-26.7962404	26.1175966	-39.1675277
##	[266]	47.0468103	-44.0907697	51.9754785	-55.0767180	33.3679855
##	[271]	-7.1155155	-6.6351415	13.8537274	-27.1879678	39.2973364
##	[276]	-19.7686799	-23.5211809	47.0414704	-49.8897824	62.0615940
##	[281]	-80.9513737	76.8483774	-46.2028337	22.8230054	-17.6237869
##	[286]	2.9934152	23.5369073	-28.1514845	1.4565497	16.5702100
##	[291]	-6.6872066	12.9056613	-47.6590340	67.1798779	-68.6122962
##	[296]	66.1365649	-30.0281751	-41.7902929	79.2579427	-49.3243130
##	[301]	17.0770937	-17.8331050	12.1735295	11.6531460	-34.3368752
##	[306]	41.4282812	-15.6847540	-28.8578492	4.1592220	148.9706706
##	[311]	-287.9233357	249.0368471	-111.4301018	5.5697905	50.2496076
##	[316]	-54.2063214	21.9597827	1.4420450	-0.1182551	-14.4303120
##	[321]	39.3681658	-72.4739104	96.6975914	-97.5546992	69.9012364
##	[326]	-12.4131100	-40.7496441	20.7854525	74.1702519	-144.3380318
##	[331]	114.0674922	-22.5416963	-40.8360697	52.5808802	-63.6808585
##	[336]	85.0863636	-56.5733624	-21.6235469	52.0572223	-0.7111524
##	[341]	-51.7647905	61.7952124	-67.2176891	77.2291117	-56.1171447
##	[346]	11.2727732	-1.5796294	40.6831332	-69.9435114	54.2254388
##	[351]	-17.8333368	-20.3415516	60.7072080	-82.5070099	58.1214015
##	[356]	-6.4709954	-13.7115153	-19.8780248	55.2340392	-42.6874836
##	[361]	10.1888124	-5.7881318	18.2653256	-14.3281400	87.0825919
##	[366]	-339.9419391	510.0276537	-335.9474066	76.1653189	9.8189349
##	[371]	-2.8126566	-3.2868922	1.6998334	-6.4678391	19.9332340
##	[376]	-26.5218529	27.8044403	-24.4655434	2.5530806	29.6789239
##	[381]	-46.0505777	40.7201457	-31.3569392	27.4649608	-14.4020723
##	[386]	-15.9728189	42.1983177	-41.0708613	19.8619512	-3.1883459
##	[391]	-3.7465006	14.2039539	-22.8041137	10.5258984	11.4077318
##	[396]	-21.3077512	32.5999607	-55.2037740	71.4377062	-81.1279460

##	[401]	87.0824856	-71.3047981	40.8767116	-27.4249140	35.9383753
##	[406]	-41.2777632	24.4529370	1.6745136	-14.0695565	20.8194560
##	[411]	-43.2830651	62.4812474	-35.4498111	-18.8921452	29.8803937
##	[416]	-1.9849301	1.2205346	-21.6561346	12.6246461	20.7392514
##	[421]	-38.9771326	31.4607297	-83.7127144	266.4079643	-375.0434851
##	[426]	226.8912400	-17.8821766	-60.8876125	39.8475855	4.3020064
##	[431]	-12.8548670	4.4763002	-19.8061956	23.4558866	23.4352136
##	[436]	-84.6625698	94.4280958	-55.8395590	34.5335819	-64.5408873
##	[441]	109.3335241	-102.5037209	50.2037955	-32.3179461	57.3316419
##	[446]	-66.8443029	48.4130640	-15.6028178	-8.1508987	-19.1580775
##	[451]	87.0700574	-142.5247942	161.7455105	-138.3950339	82.4437631
##	[456]	-27.5798213	-7.9099656	23.6745351	-18.1556489	-7.4295946
##	[461]	32.1368231	-13.7502291	-38.9856733	42.9885012	30.0491609
##	[466]	-108.4446982	130.2237106	-84.8116037	1.0576969	52.3490906
##	[471]	-43.5612283	18.5129207	-12.9272800	-0.7397434	51.9394450
##	[476]	-89.5755543	63.5557817	-32.7008787	37.8171777	-45.7973660
##	[481]	67.8891174	-122.9280979	152.4764065	-109.6867563	38.3997174
##	[486]	5.9814094	-22.5512445	16.5975981	12.4405140	-28.5443604
##	[491]	7.6992349	19.7382961	-31.1530452	28.9386312	-13.0232408
##	[496]	3.6912339	-24.4577348	52.1109597	-61.2031539	60.3650702
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##	[506]	-60.6995877	30.5934439	-52.6028871	82.6230516	-52.0449243
##	[511]	-30.3774062	72.5037412	-34.9419926	-20.1998756	47.5467683
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##	[531]	31.5623910	70.9165829	-56.6414135	15.5209420	24.7335938
##	[536]	-38.9903787	34.1052903	-27.8327597	25.5856693	-25.1064203
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##	[546]	5.4895506	-10.6888539	18.7491831	-24.3010307	26.1499397
##	[551]	-20.5123373	7.0806450	1.8249488	4.4903074	-20.9410298
##	[556]	29.6767190	-20.9432100	7.6300511	-4.2979891	7.0546381
##	[561]	-8.5752314	10.1321015	-9.0362763	4.1477059	-4.7329074
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##	[591]	14.1337626	-11.9021593	-13.0688979	40.0537336	-45.2383013
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##	[601]	-24.4237223	31.4048465	-65.4633270	83.2681429	-61.8101673
##	[606]	41.3214474	-50.1669298	67.3807470	-64.2612180	49.9184091
##	[611]	-35.2885308	5.7858886	6.5646812	45.2386510	-103.8164896
##	[616]	91.8509990	-48.5998507	40.7578529	-68.8794820	110.6985146
##	[621]	-118.1289283	67.3293382	-25.6317781	21.4962443	-15.7261976
##	[626]	16.9930601	-31.9312315	13.6349904	46.4445101	-81.8103239
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##	[636]	23.4149703	-6.4209357	3.7339812	-17.8399891	7.7944066
##	[641]	30.9665376	-51.7223004	32.0075384	1.2681436	-14.0552778
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##	[651]	21.4682712	-7.6030993	0.7203845	-3.4521949	11.2312502
##	[656]	-25.9366714	33.6064886	-20.7281740	7.9027334	-22.7775241
##	[661]	50.6353361	-59.5470332	58.9707333	-59.1152121	22.5024783
##	[666]	52.3326499	-97.4955186	80.6450161	-35.7909058	0.5368066

##	[671]	15.5686452	-21.3259336	2.3566054	50.1206102	-62.9196257
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##	[691]	137.9183311	-117.7753493	79.5943872	-40.7070674	2.2904252
##	[696]	42.1757277	-79.9705559	93.6680932	-79.1318609	45.0567158
##	[701]	-11.7383564	0.8315308	-8.4160433	11.1701971	-1.3716367
##	[706]	-5.8340730	-11.1321627	46.1329233	37.0395056	-350.5275595
##	[711]	568.5168937	-373.7948321	82.7968286	-10.7540677	38.7781037
##	[716]	-43.3795577	27.0213078	-2.1432320	-26.5395083	46.5398342
##	[721]	-32.4334930	-8.2293450	33.0605987	-29.0123427	11.7169684
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##	[761]	54.6168501	-13.2480285	-112.7786666	381.8049116	-527.6805547
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##	[806]	15.8565490	-19.1919942	18.0979654	-7.4729295	-12.5947458
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##	[891]	-76.9695914	83.0324146	-41.2504264	-24.3365123	61.5814195
##	[896]	-58.6896196	53.0575464	-53.4048499	33.7187691	-2.5810806
##	[901]	-8.4762778	6.9543369	-19.1449902	37.3874991	-37.7809949
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##	[911]	-138.1332778	67.8633789	31.4273008	-80.8014467	64.5673508
##	[916]	-46.1770638	66.1582187	-86.6764262	68.1190233	-36.7331453
##	[921]	31.1036079	-34.8086291	9.1149456	23.6801877	-5.2679946
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##	[941]	-41.4675714	61.2639419	-61.2414848	58.4496725	-41.2569577
##	[946]	11.0861236	18.4165046	-32.0950080	32.9498060	-41.7130745
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##	[961]	-45.8332504	7.4203076	11.0355031	-0.8914249	0.6798196
##	[966]	-44.7615037	92.5488381	-100.8187572	88.6801220	-72.1057720
##	[971]	39.6995899	3.6703347	-29.6271629	21.1718193	-15.2962528
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##	[986]	-57.6217784	-50.6750137	62.3468470	-46.2035400	47.0293493
##	[991]	-81.5795172	107.1008901	-99.7855657	96.7960970	-105.3638330
##	[996]	102.0497924	-98.7799369	99.2806511	-88.4256785	70.1296080
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##	[1006]	-109.1715384	65.6264628	-83.6217714	122.9095069	-122.3432621
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##	[1031]	-36.2476756	10.2712087	27.4729793	-31.0511484	29.7727820
##	[1036]	-119.8602916	210.5292571	-152.9262134	41.6630571	0.6851438
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##	[1046]	-5.5323974	12.1803564	-15.1223919	11.9735778	-1.6268633
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##	[1056]	-6.3860352	0.2612351	7.6447799	-9.0877350	-2.2209791
##	[1061]	17.6533085	-24.5618608	21.8476284	-14.3709471	6.6169198
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##	[1121]	-11.6282696	1.9709371	14.1392660	-7.4917442	-8.5663753
##	[1126]	1.2032939	14.5324666	-8.0780286	-14.5120142	27.3567689
##	[1131]	-18.7727988	-36.4986670	166.8646790	-259.9605352	165.7796024
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##	[1201]	-34.5113630	35.6148523	26.8206218	-67.7890896	39.7417020
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## [1291]	-45.7738017	109.6631242	-122.4358100	76.3243860	-33.1955569
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## [1301]	-27.7683856	1.7497104	24.1371950	-25.5858596	15.2839529
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## [1331]	-16.8214223	6.7986908	19.4174438	-47.6616717	69.3737283
## [1336]	-71.1523785	49.3302914	-22.6657730	-10.5492354	77.4273638
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## [1391]	40.8443985	-49.5613037	32.5066788	0.1155440	-26.0031561
## [1396]	37.6531096	-27.3913106	-0.1230592	16.5355422	-4.9325982
## [1401]	-17.5924792	27.8065904	-26.8954636	27.7571793	-29.8375832
## [1406]	31.5142492	-38.2696908	42.1531211	-29.2915041	4.3218275
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## [1416]	37.1197443	-68.5705857	61.4110465	-45.9027376	44.1077051
## [1421]	-40.7979526	38.6631995	-52.7370245	55.2247833	-15.1319659
## [1426]	-31.9731042	44.4432793	-42.8350602	46.2396636	-41.4516014
## [1431]	34.0795733	-39.6599599	57.5657698	-74.7526158	65.9092579
## [1436]	-32.0557679	8.1850734	-2.4165481	-6.9714268	24.7631621
## [1441]	-31.1328847	18.4530250	-9.0837731	21.0701272	-47.2416020
## [1446]	61.3419215	-45.8226437	25.4908857	-17.9875915	24.5001837
## [1451]	-79.1607806	130.2368726	-59.4644650	-83.1967400	157.3681397
## [1456]	-135.5137645	79.0958499	-51.0711032	46.1476441	-6.5020912
## [1461]	-64.4078164	93.3223651	-57.8956917	18.9890942	-20.4674420
## [1466]	32.6123570	-15.3825439	-16.0076735	13.9733634	36.3155173
## [1471]	-87.6686421	94.6128685	-75.6500475	45.0690432	17.9836575
## [1476]	-89.8623069	126.6112465	-120.5371975	69.1101260	-5.3768645

```
## [1481]    6.9960821 -76.5942719 122.2998579 -103.9428664 86.9005747
## [1486] -119.8046510 161.8232305 -149.6215041 66.9016424 45.7086723
## [1491] -115.6928613 97.2390566 -34.8225569
```

```
diff(binary_data$x, differences = 10)
```

```
## [1] -7.892467e+02 1.398625e+03 -1.429011e+03 1.095810e+03 -8.997068e+02
## [6] 1.072627e+03 -1.365881e+03 1.428414e+03 -1.217527e+03 9.548551e+02
## [11] -7.437349e+02 4.134235e+02 8.051029e+01 -3.407281e+02 3.876707e+00
## [16] 6.071186e+02 -6.940148e+02 -1.115313e+02 1.214117e+03 -1.532086e+03
## [21] 5.687617e+02 1.016602e+03 -2.015646e+03 1.888976e+03 -1.240666e+03
## [26] 9.964775e+02 -1.382147e+03 1.958145e+03 -2.385937e+03 2.782785e+03
## [31] -3.332364e+03 3.754027e+03 -3.442433e+03 2.300481e+03 -1.039269e+03
## [36] 2.857809e+02 1.137219e+02 -5.276278e+02 8.655102e+02 -7.939110e+02
## [41] 1.950706e+02 6.451176e+02 -1.103207e+03 7.317431e+02 2.245713e+02
## [46] -1.152554e+03 1.833822e+03 -2.557108e+03 3.452611e+03 -3.997853e+03
## [51] 3.563207e+03 -2.343465e+03 1.188058e+03 -5.927024e+02 4.103360e+02
## [56] -3.826085e+02 4.458715e+02 -5.790729e+02 6.645660e+02 -5.733698e+02
## [61] 3.015472e+02 4.469760e+01 -3.597058e+02 5.748010e+02 -6.278094e+02
## [66] 4.672708e+02 -1.044884e+02 -3.517585e+02 7.431851e+02 -9.535966e+02
## [71] 9.436533e+02 -7.456345e+02 4.821557e+02 -3.494441e+02 4.849060e+02
## [76] -8.092142e+02 1.063250e+03 -1.064215e+03 8.732045e+02 -6.863403e+02
## [81] 6.456598e+02 -7.485671e+02 8.531850e+02 -7.978296e+02 5.544248e+02
## [86] -2.274460e+02 -5.086213e+01 1.634268e+02 -6.698734e+01 -8.193312e+01
## [91] -3.969795e+01 6.157042e+02 -1.400138e+03 1.854158e+03 -1.685923e+03
## [96] 1.125248e+03 -5.079284e+02 -1.538440e+02 8.996863e+02 -1.432228e+03
## [101] 1.404448e+03 -9.045831e+02 3.816285e+02 -2.289394e+02 5.276577e+02
## [106] -1.060956e+03 1.536045e+03 -1.767619e+03 1.632090e+03 -1.059496e+03
## [111] 2.062576e+02 5.851488e+02 -1.114400e+03 1.398900e+03 -1.413584e+03
## [116] 1.057192e+03 -3.921482e+02 -3.474227e+02 9.723274e+02 -1.374866e+03
## [121] 1.429818e+03 -1.086830e+03 5.770311e+02 -3.350261e+02 5.869771e+02
## [126] -1.059466e+03 1.201455e+03 -7.549334e+02 3.787991e+01 4.274742e+02
## [131] -4.429502e+02 2.010557e+02 -4.544924e+01 2.475343e+02 -7.743041e+02
## [136] -1.236213e+03 -1.260049e+03 9.015917e+02 -5.723835e+02 6.173761e+02
## [141] -1.036531e+03 1.524852e+03 -1.697384e+03 1.377990e+03 -7.798200e+02
## [146] 3.086842e+02 -9.565299e+01 -1.362250e+02 6.290116e+02 -1.192414e+03
## [151] 1.474191e+03 -1.644317e+03 2.554470e+03 -4.692300e+03 6.968418e+03
## [156] -7.526232e+03 6.007690e+03 -3.888787e+03 2.499383e+03 -1.890855e+03
## [161] 1.558261e+03 -1.183904e+03 5.809494e+02 3.686603e+02 -1.437578e+03
## [166] 2.086027e+03 -2.004103e+03 1.371926e+03 -5.578929e+02 -1.000108e+02
## [171] 3.165879e+02 -8.563485e+01 -1.949081e+02 1.299321e+02 2.476733e+02
## [176] -6.349773e+02 8.648013e+02 -9.765160e+02 1.001631e+03 -8.611936e+02
## [181] 5.025688e+02 -3.704386e+01 -3.398078e+02 4.979253e+02 -3.868810e+02
## [186] 4.551298e+01 2.435039e+02 2.655895e+02 -2.624145e+03 6.889409e+03
## [191] -1.077473e+04 1.130452e+04 -8.386508e+03 4.871886e+03 -2.973695e+03
## [196] 2.523870e+03 -2.414024e+03 2.038714e+03 -1.414769e+03 8.371006e+02
## [201] -5.828456e+02 6.821617e+02 -8.048427e+02 4.398638e+02 5.795868e+02
## [206] -1.750290e+03 2.355141e+03 -2.203558e+03 1.674431e+03 -1.079279e+03
## [211] 2.551558e+02 1.035463e+03 -2.366603e+03 2.597248e+03 -8.225301e+02
## [216] -2.447907e+03 5.174596e+03 -5.479161e+03 3.576765e+03 -1.321063e+03
## [221] 4.603715e+01 2.555801e+02 -1.192814e+02 -3.783027e+01 3.735532e+01
## [226] 1.718425e+01 8.225746e+01 -3.398957e+02 5.999156e+02 -8.198358e+02
## [231] 1.004936e+03 -9.483678e+02 4.497382e+02 2.342203e+02 -5.914911e+02
## [236] 4.476568e+02 -9.625106e-01 -5.275525e+02 9.565619e+02 -1.090967e+03
```

```

## [241] 8.863043e+02 -5.795432e+02 4.784964e+02 -5.838034e+02 5.713078e+02
## [246] -2.514455e+02 -1.612162e+02 3.707170e+02 -3.397486e+02 1.593526e+02
## [251] 2.003567e+02 -8.234684e+02 1.536555e+03 -1.794434e+03 1.153079e+03
## [256] 8.195527e+01 -9.986611e+02 9.958748e+02 -3.199407e+02 -3.878080e+02
## [261] 8.190477e+02 -1.081016e+03 1.291957e+03 -1.448285e+03 1.543816e+03
## [266] -1.511978e+03 1.217358e+03 -6.851646e+02 1.302638e+02 3.111803e+02
## [271] -6.527325e+02 8.160790e+02 -5.758064e+02 -9.894749e+01 8.789963e+02
## [276] -1.458409e+03 1.859848e+03 -2.157065e+03 2.192032e+03 -1.829069e+03
## [281] 1.246564e+03 -7.037606e+02 2.206539e+02 2.367070e+02 -4.750056e+02
## [286] 3.212332e+02 3.318397e+01 -3.093273e+02 5.827982e+02 -1.060165e+03
## [291] 1.628803e+03 -1.969834e+03 1.839398e+03 -1.083679e+03 -1.639401e+02
## [296] 1.257904e+03 -1.567964e+03 1.203433e+03 -7.241960e+02 3.421735e+02
## [301] 1.016662e+02 -6.040256e+02 8.533097e+02 -6.060194e+02 2.379219e+02
## [306] -8.224580e+02 3.008164e+03 -5.675900e+03 6.673016e+03 -5.170856e+03
## [311] 2.397652e+03 -6.639780e+01 -1.013637e+03 1.000011e+03 -5.402976e+02
## [316] 2.599220e+02 -4.271849e+02 9.950186e+02 -1.771497e+03 2.460661e+03
## [321] -2.706180e+03 2.251837e+03 -1.183081e+03 1.339385e+02 -3.180511e+01
## [326] 1.178271e+03 -2.633285e+03 3.005993e+03 -1.905191e+03 2.051465e+02
## [331] 1.110884e+03 -1.826261e+03 2.052656e+03 -1.627407e+03 5.776136e+02
## [336] 3.206455e+02 -2.586090e+02 -6.048205e+02 1.493305e+03 -1.990505e+03
## [341] 2.097067e+03 -1.789290e+03 1.175844e+03 -7.596980e+02 9.390516e+02
## [346] -1.414398e+03 1.515510e+03 -9.485735e+02 -7.005449e+01 1.137752e+03
## [351] -1.813095e+03 1.748805e+03 -1.070487e+03 4.553330e+02 -4.709992e+02
## [356] 9.126603e+02 -1.121626e+03 8.720172e+02 -5.340957e+02 4.928894e+02
## [361] -1.140419e+03 3.320959e+03 -7.246237e+03 1.070534e+04 -1.061755e+04
## [366] 6.959300e+03 -2.842452e+03 6.085924e+02 -4.678001e+01 7.825747e+01
## [371] -2.214866e+02 4.362105e+02 -6.620776e+02 7.742777e+02 -6.583288e+02
## [376] 2.412851e+02 3.920993e+02 -9.550217e+02 1.197798e+03 -1.132430e+03
## [381] 8.939078e+02 -4.941128e+02 -9.908817e+01 7.074523e+02 -1.000652e+03
## [386] 8.484878e+02 -4.451191e+02 4.097519e+01 2.682473e+02 -4.268466e+02
## [391] 3.297200e+02 1.973253e+01 -4.699248e+02 9.330465e+02 -1.434300e+03
## [396] 1.943445e+03 -2.340993e+03 2.491897e+03 -2.292759e+03 1.811418e+03
## [401] -1.347592e+03 1.140163e+03 -1.070753e+03 8.419817e+02 -3.789442e+02
## [406] -1.412786e+02 6.117063e+02 -1.060904e+03 1.334167e+03 -1.092204e+03
## [411] 3.698791e+02 2.591403e+02 -4.054230e+02 3.212541e+02 -3.109557e+02
## [416] 2.082220e+02 1.979912e+02 -7.534008e+02 1.480422e+03 -3.074443e+03
## [421] 5.799596e+03 -8.016877e+03 7.463623e+03 -4.245074e+03 8.845094e+02
## [426] 6.566850e+02 -5.732610e+02 4.636911e+01 2.774610e+02 -4.052455e+02
## [431] 2.660186e+02 4.140269e+02 -1.471872e+03 2.198358e+03 -2.186633e+03
## [436] 1.892572e+03 -2.013542e+03 2.529974e+03 -2.758947e+03 2.357205e+03
## [441] -1.800572e+03 1.632653e+03 -1.711221e+03 1.541413e+03 -1.010116e+03
## [446] 5.662893e+02 -8.143740e+02 1.911499e+03 -3.330711e+03 4.271630e+03
## [451] -4.240898e+03 3.289629e+03 -1.890732e+03 6.107841e+02 1.788508e+02
## [456] -3.609871e+02 5.910884e+01 3.109769e+02 -2.399460e+02 -2.691341e+02
## [461] 4.601633e+02 3.618757e+02 -1.866941e+03 2.919057e+03 -2.675565e+03
## [466] 1.312950e+03 1.949513e+02 -9.744950e+02 9.453259e+02 -5.289191e+02
## [471] -9.127158e+01 9.550761e+02 -1.756401e+03 1.993072e+03 -1.697267e+03
## [476] 1.409411e+03 -1.525579e+03 2.125768e+03 -3.047045e+03 3.726121e+03
## [481] -3.490178e+03 2.313717e+03 -8.957394e+02 -5.418867e+01 2.922488e+02
## [486] -9.887436e+00 -3.230674e+02 2.781964e+02 1.499322e+02 -5.995893e+02
## [491] 7.607164e+02 -6.380361e+02 5.173906e+02 -6.973025e+02 1.163547e+03
## [496] -1.609641e+03 1.756825e+03 -1.465701e+03 6.449040e+02 6.379357e+02
## [501] -1.936573e+03 2.601472e+03 -2.406840e+03 1.882390e+03 -1.705364e+03
## [506] 1.795773e+03 -1.415897e+03 2.849326e+02 8.404739e+02 -1.025753e+03

```



```

## [511] 2.575418e+02 6.718062e+02 -1.065267e+03 8.179084e+02 -2.837284e+02
## [516] -1.134331e+02 1.586587e+02 1.553073e+02 -7.027780e+02 1.301927e+03
## [521] -1.900687e+03 2.633060e+03 -3.844140e+03 6.201612e+03 -9.732311e+03
## [526] 1.229490e+04 -1.106616e+04 6.325371e+03 -1.495002e+03 -8.421935e+02
## [531] 8.819857e+02 -3.293995e+01 -7.013528e+02 1.003853e+03 -9.921008e+02
## [536] 8.920600e+02 -8.106642e+02 7.238321e+02 -5.768395e+02 3.628308e+02
## [541] -1.355209e+02 -4.303268e+01 1.707951e+02 -3.034989e+02 4.739896e+02
## [546] -6.406980e+02 7.185868e+02 -6.404554e+02 4.263461e+02 -2.246612e+02
## [551] 2.169510e+02 -4.215961e+02 6.391502e+02 -6.578430e+02 4.836018e+02
## [556] -2.975216e+02 2.256280e+02 -2.451155e+02 2.759736e+02 -2.670860e+02
## [561] 2.248659e+02 -2.041182e+02 2.229875e+02 -1.910807e+02 -9.076523e+00
## [566] 3.060046e+02 -1.558340e+02 -1.404093e+03 4.605100e+03 -7.618520e+03
## [571] 7.735657e+03 -4.487126e+03 2.897462e+02 2.257557e+03 -2.536317e+03
## [576] 1.620402e+03 -9.392416e+02 1.120781e+03 -1.603715e+03 1.354830e+03
## [581] 2.196266e+01 -1.901955e+03 3.150683e+03 -2.998082e+03 1.684760e+03
## [586] -2.455318e+02 -5.064103e+02 5.743818e+02 -3.023820e+02 -1.637153e+02
## [591] 7.331572e+02 -1.210795e+03 1.494782e+03 -1.605430e+03 1.532388e+03
## [596] -1.301634e+03 1.057400e+03 -9.628099e+02 1.145190e+03 -1.597829e+03
## [601] 2.019135e+03 -2.066279e+03 1.831336e+03 -1.708368e+03 1.815119e+03
## [606] -1.893456e+03 1.711095e+03 -1.263121e+03 7.370127e+02 -5.485829e+02
## [611] 1.061891e+03 -1.971369e+03 2.460061e+03 -2.241498e+03 1.911744e+03
## [616] -2.102845e+03 2.706143e+03 -3.035708e+03 2.626610e+03 -1.754162e+03
## [621] 1.021680e+03 -6.846092e+02 6.335967e+02 -6.111006e+02 2.423208e+02
## [626] 6.128493e+02 -1.457708e+03 1.639284e+03 -1.179491e+03 6.155902e+02
## [631] -2.040271e+02 -1.450491e+02 3.897468e+02 -4.120804e+02 3.326024e+02
## [636] -2.792648e+02 7.487981e+01 4.294064e+02 -9.288459e+02 9.639407e+02
## [641] -5.258259e+02 6.858024e+01 3.738345e+01 1.479466e+02 -3.557633e+02
## [646] 4.773920e+02 -5.537900e+02 5.549516e+02 -4.215911e+02 2.411863e+02
## [651] -1.833025e+02 3.213293e+02 -5.784212e+02 7.665836e+02 -7.465524e+02
## [656] 6.448011e+02 -7.567736e+02 1.151076e+03 -1.577583e+03 1.779210e+03
## [661] -1.589410e+03 8.114188e+02 5.118775e+02 -1.765670e+03 2.200057e+03
## [666] -1.691285e+03 7.648286e+02 -2.948853e-01 -2.921333e+02 6.091333e-01
## [671] 6.634827e+02 -9.949441e+02 4.039769e+02 7.132812e+02 -1.337215e+03
## [676] 1.054993e+03 -3.908925e+02 3.475842e+01 -1.932008e+02 5.963278e+02
## [681] -8.095978e+02 5.766252e+02 -8.964376e+01 -6.909677e+01 -5.684528e+02
## [686] 1.861844e+03 -3.158982e+03 3.852328e+03 -3.746315e+03 3.000819e+03
## [691] -1.899086e+03 6.548730e+02 6.092442e+02 -1.716776e+03 2.385691e+03
## [696] -2.407050e+03 1.849720e+03 -1.069852e+03 4.833647e+02 -2.534469e+02
## [701] 2.127825e+02 -1.502919e+02 1.214364e+02 -2.646344e+02 9.127045e+00
## [706] 2.180394e+03 -6.850253e+03 1.128128e+04 -1.163753e+04 7.851577e+03
## [711] -3.610270e+03 1.527020e+03 -1.095394e+03 8.928299e+02 -3.680839e+02
## [716] -3.306093e+02 8.469941e+02 -8.460803e+02 3.069648e+02 3.609708e+02
## [721] -6.768291e+02 4.943701e+02 -5.896563e-02 -4.925459e+02 6.822386e+02
## [726] -4.239682e+02 -1.438663e+02 6.942931e+02 -1.007520e+03 1.138661e+03
## [731] -1.250311e+03 1.356391e+03 -1.344375e+03 1.192011e+03 -1.008332e+03
## [736] 8.729025e+02 -7.802291e+02 7.724033e+02 -9.638833e+02 1.316286e+03
## [741] -1.557322e+03 1.500751e+03 -1.267754e+03 1.017106e+03 -6.651598e+02
## [746] 7.358297e+01 6.295014e+02 -1.118862e+03 1.223445e+03 -1.034038e+03
## [751] 6.714855e+02 -1.740839e+02 -3.582992e+02 7.800086e+02 -1.114051e+03
## [756] 1.479135e+03 -1.758680e+03 1.529868e+03 -1.477415e+02 -3.087108e+03
## [761] 7.786939e+03 -1.130861e+04 1.069305e+04 -6.261990e+03 1.242993e+03
## [766] 2.029102e+03 -3.534764e+03 4.002401e+03 -3.855844e+03 3.329437e+03
## [771] -2.533987e+03 1.439866e+03 -9.510771e+01 -1.244917e+03 2.318089e+03
## [776] -3.026979e+03 3.326679e+03 -3.126908e+03 2.395346e+03 -1.301225e+03

```

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## [781] 2.856977e+02 9.153357e+01 3.760237e+02 -1.197662e+03 1.514145e+03
## [786] -8.823336e+02 -2.345238e+02 8.133408e+02 -3.226697e+02 -6.024274e+02
## [791] 9.007956e+02 -4.229299e+02 -1.014344e+01 -1.550090e+02 5.534808e+02
## [796] -6.460317e+02 5.390575e+02 -6.519589e+02 9.229950e+02 -9.167869e+02
## [801] 5.797851e+02 -3.091563e+02 3.270087e+02 -4.635455e+02 4.802182e+02
## [806] -2.803778e+02 -6.845500e+01 3.195526e+02 -2.036363e+02 -3.116119e+02
## [811] 1.081069e+03 -1.952068e+03 2.544759e+03 -2.246693e+03 9.381356e+02
## [816] 6.722596e+02 -1.762216e+03 2.053101e+03 -1.712946e+03 9.926644e+02
## [821] -1.450388e+01 -1.098230e+03 1.865529e+03 -1.640186e+03 4.205971e+02
## [826] 1.043993e+03 -2.192692e+03 3.039987e+03 -3.469115e+03 3.027747e+03
## [831] -1.814898e+03 7.311493e+02 -3.582298e+02 3.500241e+02 -2.436805e+02
## [836] 2.460225e+01 2.223233e+02 -3.926144e+02 2.223508e+02 2.517444e+02
## [841] -4.835659e+02 2.022776e+02 1.597197e+02 -2.175402e+02 1.679451e+02
## [846] -2.735983e+02 3.891398e+02 -2.374966e+02 -1.473085e+02 3.497357e+02
## [851] 5.032580e+01 -9.761907e+02 1.857935e+03 -2.082859e+03 1.291395e+03
## [856] 4.045863e+02 -2.234908e+03 3.279168e+03 -3.409622e+03 3.263741e+03
## [861] -3.144796e+03 2.531189e+03 -9.307214e+02 -1.287991e+03 3.214318e+03
## [866] -4.236078e+03 4.407095e+03 -4.118569e+03 3.526740e+03 -2.548312e+03
## [871] 1.424803e+03 -7.753784e+02 9.514611e+02 -1.718252e+03 2.552982e+03
## [876] -3.012000e+03 2.912347e+03 -2.346698e+03 1.592671e+03 -9.672795e+02
## [881] 6.089583e+02 -3.818119e+02 1.209231e+02 9.702830e+01 -5.647597e+01
## [886] -3.450647e+02 1.031296e+03 -1.740111e+03 2.017757e+03 -1.488527e+03
## [891] 2.946741e+02 9.164004e+02 -1.601835e+03 1.750458e+03 -1.590828e+03
## [896] 1.199643e+03 -6.337446e+02 1.091300e+02 2.407944e+02 -5.255121e+02
## [901] 8.148118e+02 -9.428217e+02 7.920846e+02 -6.330402e+02 9.692112e+02
## [906] -1.972856e+03 3.128911e+03 -3.524364e+03 2.597704e+03 -7.243960e+02
## [911] -1.013851e+03 1.840005e+03 -1.960346e+03 2.028492e+03 -2.201127e+03
## [916] 2.139692e+03 -1.738389e+03 1.288797e+03 -9.328017e+02 5.078180e+02
## [921] -8.150289e+01 1.084086e+02 -7.747696e+02 1.629359e+03 -2.047175e+03
## [926] 1.468399e+03 8.074183e+02 -4.786416e+03 8.466896e+03 -9.128008e+03
## [931] 6.490074e+03 -2.935792e+03 4.896453e+02 7.712719e+02 -1.471509e+03
## [936] 1.647931e+03 -1.029912e+03 -1.525356e+02 1.220333e+03 -1.746185e+03
## [941] 1.762070e+03 -1.401552e+03 7.527431e+02 1.994196e+00 -6.148897e+02
## [946] 9.910804e+02 -1.220203e+03 1.337476e+03 -1.224078e+03 8.252507e+02
## [951] -2.900048e+02 -1.634968e+02 4.101968e+02 -5.154105e+02 7.262674e+02
## [956] -1.171332e+03 1.561081e+03 -1.463953e+03 8.785394e+02 -2.578071e+02
## [961] -8.449509e+01 3.798260e+02 -1.033469e+03 1.970168e+03 -2.673670e+03
## [966] 2.802723e+03 -2.399329e+03 1.614294e+03 -6.401939e+02 -1.835266e+02
## [971] 6.245360e+02 -9.471001e+02 1.647708e+03 -2.675193e+03 3.374070e+03
## [976] -3.409308e+03 3.119204e+03 -2.466664e+03 3.838166e+02 3.609234e+03
## [981] -7.472908e+03 8.174786e+03 -5.325125e+03 1.529864e+03 8.368088e+02
## [986] -1.597983e+03 1.809737e+03 -2.214743e+03 2.763878e+03 -3.113136e+03
## [991] 3.211770e+03 -3.236657e+03 3.251083e+03 -3.216741e+03 3.108477e+03
## [996] -2.865275e+03 2.385857e+03 -1.587293e+03 4.245877e+02 1.051825e+03
## [1001] -2.556190e+03 3.539110e+03 -3.615425e+03 3.140926e+03 -2.922197e+03
## [1006] 3.186230e+03 -3.284155e+03 2.478678e+03 -6.593151e+02 -1.592004e+03
## [1011] 3.285083e+03 -3.623983e+03 2.727304e+03 -1.464610e+03 3.132787e+02
## [1016] 1.098443e+03 -3.062017e+03 5.042465e+03 -6.190156e+03 6.177640e+03
## [1021] -5.281748e+03 3.941036e+03 -2.527907e+03 1.349635e+03 -5.190604e+02
## [1026] -9.590292e+01 5.835134e+02 -7.723897e+02 4.767265e+02 1.420867e+02
## [1031] -7.663618e+02 1.545164e+03 -2.884632e+03 4.290105e+03 -4.471259e+03
## [1036] 3.114614e+03 -1.385938e+03 3.634020e+02 -4.876444e+01 -2.618228e+01
## [1041] 7.960622e+01 -6.452482e+01 -6.456232e+01 2.424735e+02 -3.591320e+02
## [1046] 3.324945e+02 -1.380714e+02 -1.545626e+02 3.782235e+02 -3.829090e+02

```

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## [1051] 1.865457e+02 3.715862e+01 -1.284710e+02 5.937316e+01 7.729556e+01
## [1056] -1.308747e+02 -6.198179e+00 2.903164e+02 -5.477779e+02 6.330541e+02
## [1061] -5.402748e+02 3.724411e+02 -2.385930e+02 1.696430e+02 -1.325129e+02
## [1066] 1.207577e+02 -1.514009e+02 1.605479e+02 -2.993508e+01 -2.386298e+02
## [1071] 4.765387e+02 -5.182636e+02 3.649055e+02 -1.610037e+02 4.580776e+01
## [1076] -4.817733e+01 9.666494e+01 -9.884484e+01 4.490975e+01 -4.704668e+01
## [1081] 1.951897e+02 -3.928602e+02 4.778800e+02 -4.577548e+02 4.516863e+02
## [1086] -4.560942e+02 3.269222e+02 1.832090e+01 -4.507383e+02 7.341738e+02
## [1091] -8.228334e+02 9.314291e+02 -1.193937e+03 1.443634e+03 -1.459378e+03
## [1096] 1.205856e+03 -7.385556e+02 1.185234e+02 4.803205e+02 -7.806815e+02
## [1101] 6.388828e+02 -2.138106e+02 -1.383304e+02 1.547707e+02 9.589017e+01
## [1106] -2.652197e+02 7.651207e+01 3.639303e+02 -6.767059e+02 6.353807e+02
## [1111] -3.597802e+02 7.175522e+01 1.472067e+02 -2.974362e+02 3.582621e+02
## [1116] -3.384278e+02 2.994305e+02 -2.459362e+02 1.062644e+02 8.436135e+01
## [1121] -1.507920e+02 6.649508e+01 -3.464166e+01 1.238297e+02 -1.116053e+02
## [1126] -1.484375e+02 4.211305e+02 -1.764197e+02 -1.120247e+03 3.377995e+03
## [1131] -5.256333e+03 5.061100e+03 -2.872564e+03 7.137568e+02 -4.568876e+01
## [1136] 3.376036e+02 -5.133461e+02 4.542660e+02 -5.573434e+02 8.300915e+02
## [1141] -9.961036e+02 9.825431e+02 -9.031373e+02 7.992565e+02 -6.462460e+02
## [1146] 4.891184e+02 -3.977347e+02 3.927597e+02 -5.550246e+02 9.809528e+02
## [1151] -1.438927e+03 1.457059e+03 -1.019501e+03 7.263563e+02 -9.815520e+02
## [1156] 1.353575e+03 -9.660780e+02 -4.745198e+02 2.133026e+03 -2.864919e+03
## [1161] 2.520833e+03 -1.928403e+03 1.791427e+03 -2.145982e+03 2.610553e+03
## [1166] -2.774864e+03 2.592586e+03 -2.532336e+03 3.007174e+03 -3.601239e+03
## [1171] 3.361862e+03 -1.985695e+03 1.777439e+02 1.222282e+03 -1.889785e+03
## [1176] 1.834362e+03 -1.210315e+03 4.358903e+02 -1.318440e+02 6.990888e+02
## [1181] -1.885274e+03 2.826971e+03 -2.746581e+03 1.728985e+03 -6.373697e+02
## [1186] 1.520385e+02 -1.605781e+02 2.457061e+02 -3.399690e+02 5.615340e+02
## [1191] -7.802259e+02 7.560303e+02 -5.206428e+02 3.493123e+02 -4.155328e+02
## [1196] 5.407537e+02 -3.455437e+02 -1.711286e+02 3.938826e+02 1.326663e+02
## [1201] -9.292523e+02 1.158623e+03 -7.691344e+02 4.841182e+02 -7.825684e+02
## [1206] 1.417955e+03 -1.935521e+03 2.187828e+03 -2.200984e+03 1.953876e+03
## [1211] -1.536401e+03 1.195883e+03 -1.051714e+03 1.066002e+03 -1.270575e+03
## [1216] 1.600549e+03 -1.625210e+03 9.658661e+02 1.213481e+02 -1.004808e+03
## [1221] 1.334597e+03 -1.144243e+03 5.833402e+02 1.641539e+02 -8.268249e+02
## [1226] 1.086635e+03 -7.414292e+02 -1.331390e+02 1.176107e+03 -1.887378e+03
## [1231] 1.843676e+03 -9.712666e+02 -2.872747e+02 1.246711e+03 -1.566906e+03
## [1236] 1.456366e+03 -1.272742e+03 1.155970e+03 -1.082304e+03 1.027329e+03
## [1241] -9.878024e+02 9.297698e+02 -7.560288e+02 3.877113e+02 5.862535e+01
## [1246] -2.815026e+02 1.325439e+02 1.442168e+02 -1.927808e+02 -4.497873e+01
## [1251] 3.896877e+02 -7.358624e+02 1.098488e+03 -1.443165e+03 1.583408e+03
## [1256] -1.280227e+03 5.234156e+02 3.464885e+02 -9.414664e+02 1.166389e+03
## [1261] -1.163185e+03 1.100084e+03 -1.123293e+03 1.278982e+03 -1.361558e+03
## [1266] 1.109560e+03 -6.174746e+02 2.713280e+02 -3.528477e+02 9.116181e+02
## [1271] -1.709810e+03 2.156193e+03 -1.760914e+03 7.369427e+02 2.366704e+02
## [1276] -7.261948e+02 7.023422e+02 -3.104384e+02 -1.822853e+02 4.803972e+02
## [1281] -5.162720e+02 4.611741e+02 -4.655461e+02 5.230100e+02 -5.501015e+02
## [1286] 4.367697e+02 1.722127e+01 -9.830736e+02 2.204499e+03 -2.960372e+03
## [1291] 2.778328e+03 -2.012026e+03 1.384663e+03 -1.154686e+03 1.070311e+03
## [1296] -9.444321e+02 8.248064e+02 -6.661602e+02 3.027699e+02 2.016430e+02
## [1301] -5.415030e+02 5.414884e+02 -2.932465e+02 -2.876477e+01 3.106323e+02
## [1306] -5.329036e+02 7.443446e+02 -9.374621e+02 9.881186e+02 -8.281825e+02
## [1311] 6.174311e+02 -6.170004e+02 8.941425e+02 -1.219216e+03 1.302692e+03
## [1316] -1.120795e+03 9.094796e+02 -8.412382e+02 8.356099e+02 -6.534163e+02

```

```

## [1321] 1.137981e+02 6.432555e+02 -1.144674e+03 1.066623e+03 -6.095060e+02
## [1326] 1.691789e+02 1.144082e+02 -2.472637e+02 1.260622e+02 3.427330e+02
## [1331] -1.037997e+03 1.665735e+03 -1.932304e+03 1.702137e+03 -1.014923e+03
## [1336] -7.970576e+01 1.480690e+03 -2.703337e+03 3.084611e+03 -2.586712e+03
## [1341] 1.849548e+03 -1.296325e+03 7.735164e+02 -1.224173e+02 -4.371069e+02
## [1346] 6.166456e+02 -4.430141e+02 1.809305e+02 -3.872964e+01 1.146271e+02
## [1351] -4.855488e+02 1.115845e+03 -1.733596e+03 1.984881e+03 -1.732582e+03
## [1356] 1.147053e+03 -5.288328e+02 7.965342e+01 1.896004e+02 -4.022560e+02
## [1361] 7.049019e+02 -1.137926e+03 1.531877e+03 -1.614059e+03 1.313850e+03
## [1366] -8.637985e+02 5.226087e+02 -3.313761e+02 2.184970e+02 -1.769530e+02
## [1371] 1.996866e+02 -1.710829e+02 1.033795e+01 1.223348e+02 4.921198e+01
## [1376] -5.203056e+02 8.732438e+02 -7.040640e+02 1.186208e+02 3.700790e+02
## [1381] -4.062287e+02 1.226920e+02 5.731412e+01 1.371825e+02 -5.847424e+02
## [1386] 9.669019e+02 -1.153204e+03 1.249527e+03 -1.271628e+03 1.031571e+03
## [1391] -4.448934e+02 -2.647492e+02 7.414672e+02 -7.634247e+02 3.993409e+02
## [1396] -9.531368e-01 -7.213640e+01 -2.097265e+02 5.750267e+02 -7.986738e+02
## [1401] 8.838540e+02 -9.340725e+02 1.012701e+03 -1.114842e+03 1.142416e+03
## [1406] -9.491534e+02 5.344294e+02 -1.276541e+02 -5.965366e+01 8.153779e+01
## [1411] -5.858871e+01 -1.438021e+02 6.998272e+02 -1.384025e+03 1.755670e+03
## [1416] -1.714447e+03 1.518383e+03 -1.386034e+03 1.379963e+03 -1.453356e+03
## [1421] 1.357419e+03 -8.016070e+02 -1.046019e+02 8.936942e+02 -1.290167e+03
## [1426] 1.386274e+03 -1.345589e+03 1.285211e+03 -1.353474e+03 1.623779e+03
## [1431] -1.917165e+03 1.902571e+03 -1.454321e+03 8.118186e+02 -2.725840e+02
## [1436] -1.275163e+02 4.711955e+02 -6.927500e+02 6.931353e+02 -6.083878e+02
## [1441] 7.224869e+02 -1.099521e+03 1.454874e+03 -1.474366e+03 1.181525e+03
## [1446] -9.269016e+02 1.124196e+03 -1.862687e+03 2.448591e+03 -1.743966e+03
## [1451] -4.293321e+02 2.734754e+03 -3.731889e+03 3.317637e+03 -2.373847e+03
## [1456] 1.471283e+03 -4.455873e+02 -8.217554e+02 1.807111e+03 -1.943130e+03
## [1461] 1.434817e+03 -9.558105e+02 7.445442e+02 -5.072636e+02 1.437266e+02
## [1466] -7.896094e+01 6.917218e+02 -1.702681e+03 2.413739e+03 -2.384649e+03
## [1471] 1.588143e+03 -1.677942e+02 -1.531058e+03 2.881381e+03 -3.289707e+03
## [1476] 2.653272e+03 -1.585742e+03 1.095089e+03 -1.647340e+03 2.635913e+03
## [1481] -3.206702e+03 3.357374e+03 -3.667804e+03 4.169734e+03 -4.089171e+03
## [1486] 2.749916e+03 -4.461571e+02 -1.650903e+03

```

```
diff(binary_data$x, differences = 15)
```

```

## [1] 38601.74934 -35227.87070 34889.22350 -38339.02410 41248.28289
## [6] -39879.45307 34363.87108 -26488.55685 16820.10688 -6295.14423
## [11] -813.79667 -294.43162 7606.81088 -10879.44919 1253.88075
## [16] 17408.48265 -29152.88107 20091.94152 7571.05963 -36632.13347
## [21] 50760.28198 -48755.79408 42700.84644 -44055.21535 54338.44489
## [26] -68594.32309 83275.93896 -97251.88526 106676.41482 -103950.87811
## [31] 85013.76720 -55678.87912 27099.10386 -5713.76898 -9066.78443
## [36] 18378.83327 -19676.30758 10416.19897 5913.18511 -19148.13025
## [41] 19104.61237 -3636.28272 -20735.54409 46493.01973 -71157.54479
## [46] 93971.32216 -109283.49987 108336.14532 -89041.58770 60502.96542
## [51] -35522.42493 20673.05375 -14889.44558 14489.11280 -16469.02239
## [56] 18216.75131 -17183.63227 12067.87889 -3726.58097 -5464.74250
## [61] 12873.32665 -16310.17345 14355.19700 -6929.46285 -4178.05958
## [66] 15671.35925 -24086.02162 27250.51099 -25164.26904 20181.89220
## [71] -16221.56852 16609.23548 -21551.04444 27692.89898 -30857.99515
## [76] 29577.02525 -25956.64139 23346.25958 -23310.92981 24475.73334
## [81] -23898.21145 19623.40390 -12243.30324 4451.67056 704.23841

```

##	[86]	-1961.03859	1532.73232	-4554.67099	15066.19301	-31231.69680
##	[91]	45216.04921	-49151.37721	41168.43563	-24946.62815	4922.34588
##	[96]	15436.00168	-31507.25806	37923.57911	-33288.21836	22988.93839
##	[101]	-15732.28754	17219.52333	-26860.30830	39307.42122	-48089.01733
##	[106]	48242.00101	-37736.13399	18545.45913	3830.24066	-23312.78413
##	[111]	35977.59487	-39960.09667	34429.97974	-20250.78140	910.29509
##	[116]	18483.71745	-33052.82244	39267.08683	-36233.32646	27424.68023
##	[121]	-19978.89391	19690.80290	-25478.80113	29691.66925	-25210.11748
##	[126]	12414.55345	1335.62749	-8810.63858	9014.33020	-7119.24990
##	[131]	9485.79729	-18087.79843	28590.12431	-34162.01068	32051.06462
##	[136]	-26399.61950	24373.11200	-29624.22967	39138.01225	-45692.16769
##	[141]	43622.31658	-33228.94377	19814.41383	-8010.32439	-2419.95173
##	[146]	14301.67888	-27815.00058	40723.38624	-55240.80818	80981.15583
##	[151]	-124531.80062	174662.69999	-204889.70746	196816.92791	-157952.12050
##	[156]	112458.92205	-78329.21560	57377.32894	-41911.39036	24049.81146
##	[161]	-326.75484	-26407.96911	47890.84552	-55875.38014	48317.46388
##	[166]	-30588.09266	11773.98014	237.86314	-2859.91643	188.23069
##	[171]	630.29640	4328.19350	-13282.45922	21990.43078	-27705.08069
##	[176]	29548.98970	-26925.51430	19467.70609	-8506.76135	-2530.10903
##	[181]	9669.46041	-10494.11850	6201.44351	-4404.51320	20845.43647
##	[186]	-72947.11852	161398.16695	-254936.82828	304668.12124	-285006.45712
##	[191]	217273.60551	-146726.23838	101830.42243	-80727.64422	68031.37155
##	[196]	-53897.16357	38722.67344	-27527.66874	22714.42113	-20241.10438
##	[201]	11792.49488	7797.44616	-34273.87055	56204.60453	-64369.46631
##	[206]	57957.44055	-41150.34760	16376.14065	15162.50962	-45474.36824
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## [1216]	-11813.14420	-12624.24540	29339.47683	-32686.33359	23306.02967
## [1221]	-6026.91513	-12023.44708	22946.03235	-20737.11552	4574.98817
## [1226]	19579.24402	-40748.76059	47893.26936	-36079.33558	10145.21580
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## [1236]	-36327.26533	34017.70251	-32123.68005	29562.52533	-24704.25738
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## [1266]	-16706.59176	25324.01724	-40791.72986	53112.48611	-52079.78689
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##	[711]	119628.4308	-377048.3814	389911.6777	-188196.9682	-79773.1392
##	[716]	237068.7466	-193020.9931	-4868.8385	210746.5578	-275288.0719
##	[721]	132089.9810	175485.9693	-538062.2918	855396.5665	-1082146.6077
##	[726]	1218121.3797	-1273684.7188	1254848.6752	-1174426.7871	1063076.5522
##	[731]	-964704.9386	923545.2288	-968606.0109	1093813.8281	-1246668.4750
##	[736]	1347747.6392	-1333379.7342	1180463.2033	-894609.2366	494061.2318
##	[741]	-21367.2418	-438609.8914	776555.1130	-909026.5377	815555.5303

##	[746]	-535587.6498	140312.6274	296436.1349	-715168.1397	1060850.1545
##	[751]	-1234902.1626	1036904.5018	-177017.7813	-1556778.9276	4005635.8608
##	[756]	-6455126.8796	7860862.4792	-7473319.5130	5376322.8788	-2428983.0169
##	[761]	-328736.0953	2247494.1614	-3202933.1032	3376726.7217	-3001579.7877
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##	[771]	2572695.1645	-2811202.6170	2637975.8007	-2128499.1165	1467873.0639
##	[776]	-905518.5623	634873.1298	-665207.9906	802896.5773	-796158.1411
##	[781]	545883.3711	-192469.1058	-18557.0794	-29477.5820	227799.8597
##	[786]	-377480.9464	393525.5952	-351507.3473	359376.0880	-439292.5173
##	[791]	545025.2560	-640256.9445	714818.4033	-748699.3973	713050.4013
##	[796]	-614871.2199	506912.5201	-434624.1614	386776.7409	-312787.3603
##	[801]	187824.9106	-58936.5396	30658.1567	-201949.8446	596811.6367
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##	[816]	-3109.9703	650090.0762	-958112.6109	755089.2609	-65695.6871
##	[821]	-896488.2785	1837583.2146	-2495810.8766	2707319.4952	-2453726.0931
##	[826]	1883986.7603	-1245631.0930	736820.7732	-406561.3857	190826.8413
##	[831]	-23815.9047	-94317.4918	120711.1831	-43084.3159	-76408.7540
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##	[841]	235144.1451	-204795.1204	125274.3854	-70843.6271	163284.9866
##	[846]	-470603.1745	902676.8174	-1210798.2025	1116680.1370	-491791.6851
##	[851]	-539446.3496	1658535.6479	-2538859.9533	3003932.3620	-3025246.8875
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##	[961]	-2278489.1539	2013789.0798	-1461232.9845	767822.8442	-71500.5885
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##	[1006]	-2091730.3468	2484949.7013	-2165164.4080	1279352.8312	-18207.6806
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##	[1021]	-170749.1886	-218750.4192	319546.0146	-125663.5038	-339844.8125
##	[1026]	1036587.7515	-1891931.5364	2736082.7717	-3286497.2222	3288369.1886
##	[1031]	-2721194.2479	1843449.8659	-1006305.9099	427009.3481	-126464.3122
##	[1036]	22652.1507	-33373.7814	103043.2630	-182729.5119	220714.2685
##	[1041]	-179895.3989	62301.9237	84675.7104	-192186.0038	212988.1565
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##	[1221]	-494217.4958	241229.6650	275048.0209	-835213.6721	1170283.4251
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## [1466] -960551.3311 -55154.1976 1163067.8991 -2022955.9071 2407870.7741
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## [16] -38137073.37 44920853.51 -48583592.98 53046897.11 -60752200.98
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## [41] -85677947.94 94642341.83 -92993775.88 81351853.29 -63646307.29
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##	[121]	-11524943.87	3541030.38	2937813.82	-7209025.20	10477864.54
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##	[161]	29292797.37	-17808709.81	8212724.77	-2244265.00	-1024873.69
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##	[176]	-4199907.33	8034069.51	-13514122.47	27371604.53	-56984150.89
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##	[191]	56494329.71	-43565575.27	33124287.06	-24253882.01	14895621.00
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##	[311]	46086725.88	-56223798.38	61063877.25	-58355772.20	49874381.97
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##	[331]	-32349771.44	42638542.74	-49304911.71	50405227.89	-47175991.39
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##	[871]	-60586190.55	46748337.29	-32971544.61	21414428.39	-13282444.87
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## [1171]	32763652.63	-37181028.32	46368187.01	-55484873.91	58815395.55
## [1176]	-53713226.15	42181261.72	-29128714.42	19097515.39	-14082137.36
## [1181]	13484283.91	-15333343.27	17532688.46	-18654286.81	18270101.12
## [1186]	-16733640.79	14518363.74	-11770772.72	8675655.75	-6193450.85
## [1191]	5960414.52	-8978450.41	14420879.17	-20158582.68	24737643.40
## [1196]	-28718030.24	33891670.63	-41236271.12	49694538.16	-56779594.91
## [1201]	60211418.33	-59214668.85	54793560.36	-49111737.94	44419236.00
## [1206]	-41949777.42	41170773.36	-39795086.70	34852954.97	-24558948.31
## [1211]	9890925.43	5373915.39	-16417153.26	19827697.85	-15252694.75
## [1216]	5532326.04	4467082.82	-9746466.06	7212807.72	2808933.11
## [1221]	-16349512.67	27283854.66	-30111032.58	22674836.01	-7216987.05
## [1226]	-10969408.09	26431719.17	-36081282.50	39872077.28	-39682775.63
## [1231]	37627496.88	-34952214.08	31834133.89	-27794734.94	22375368.74
## [1236]	-15781613.49	9108046.67	-3825299.00	748559.22	698685.07
## [1241]	-2225631.47	5585306.39	-11521768.14	19407046.61	-27490948.17
## [1246]	33378347.40	-34650855.72	29756365.42	-18924472.34	4412444.69
## [1251]	10378368.76	-22490446.46	30627905.60	-35199817.55	37319104.74
## [1256]	-37670692.01	36201550.63	-32859320.84	28636728.19	-25766849.55
## [1261]	26529845.97	-31370571.47	37851584.70	-41584222.99	38827181.09
## [1266]	-29005399.54	15272189.79	-2684360.23	-4645624.94	5475673.71
## [1271]	-1429765.14	-4515074.03	9807542.00	-13250795.71	14731437.27
## [1276]	-14230140.07	10992358.18	-3565725.72	-9148076.31	26411716.50
## [1281]	-44916090.24	59789566.77	-67076605.95	65943150.99	-58836441.94
## [1286]	49551444.37	-40896838.91	33642556.36	-27013845.42	19891713.64
## [1291]	-11864352.42	3699790.70	2921746.82	-6289712.33	5612080.24
## [1296]	-1378049.68	-5030457.17	12031249.22	-18304083.55	22932663.74
## [1301]	-25511430.38	26354839.68	-26516829.70	27268469.75	-29222642.37
## [1306]	31839467.79	-33833602.10	34125534.25	-32403226.93	28803664.13
## [1311]	-23236793.30	15311753.01	-5146839.71	-5752095.89	14656737.57
## [1316]	-19015141.28	18054298.83	-13335655.61	7968260.96	-5194177.60
## [1321]	7159373.64	-14164553.27	24405112.02	-34306426.59	39536126.20
## [1326]	-36449333.96	23473773.04	-1989045.49	-23653967.84	47285351.68
## [1331]	-63134696.02	68115119.75	-62734922.02	50121054.82	-34177555.29
## [1336]	18315314.60	-5105077.24	-3848819.09	8301651.03	-9650617.27
## [1341]	10500297.61	-13487820.91	19944815.78	-29095367.91	38250678.39
## [1346]	-44019278.77	43969152.85	-37779180.86	27158715.45	-14659019.00
## [1351]	2280812.89	9154330.03	-19572526.02	28704058.76	-35543264.58
## [1356]	38733881.05	-37554927.73	32623843.98	-25698452.71	18769528.79
## [1361]	-13166452.88	9228617.75	-6593615.35	4820487.13	-3934810.45
## [1366]	4447291.83	-6672905.56	9864163.31	-12140125.66	11636140.03
## [1371]	-8004714.08	2785289.79	1870822.82	-4990327.27	7421832.62
## [1376]	-10833910.40	16127506.16	-22659251.86	28650571.81	-32096841.53
## [1381]	31469972.38	-26167902.60	16920641.13	-5936397.45	-3730106.72
## [1386]	9608648.03	-11192531.51	10178678.23	-9285518.13	10521007.44
## [1391]	-14188052.68	19200389.95	-24156512.75	28148505.10	-30784417.55
## [1396]	31740886.49	-30525566.24	26786376.24	-20874011.11	14074398.31
## [1401]	-8254634.60	5218987.47	-6195627.99	11513462.64	-20336902.70
## [1406]	30644208.61	-39851618.60	45980275.02	-48524168.51	48227834.30

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## [1411] -45931380.55 41518310.62 -33938756.56 22340893.52 -7336041.93
## [1416] -8764082.05 23038501.41 -33535219.38 40141059.46 -44201476.09
## [1421] 47275094.41 -49895403.28 51136770.43 -49274130.21 43078382.78
## [1426] -32791373.55 20098901.25 -7269976.42 -3819332.83 12268305.46
## [1431] -18285704.58 22912327.68 -27310842.29 31911690.97 -36131119.43
## [1436] 39110048.01 -40866534.35 42486704.99 -44626316.40 45427211.63
## [1441] -40229636.68 24421758.76 2250917.26 -33691984.61 60030694.22
## [1446] -72945797.24 69553065.76 -52507486.26 27576948.85 -1231058.90
## [1451] -20818275.38 34727759.91 -39466882.79 36843810.63 -30337991.35
## [1456] 23666900.55 -19999371.27 21519924.89 -28574614.91 38668558.08
## [1461] -46591520.20 46380169.34 -34271074.65 10934936.13 18305270.98
## [1466] -45553784.45 63951678.57 -71086089.29 70101098.08 -67512746.08
## [1471] 69086127.33 -76756093.41 88556784.35
```

```
diff(binary_data$x, lag = 3)
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## [1] -4.477220470 -5.897768572 -1.547168372 4.517664696 8.500545775
## [6] 0.520076014 -1.888534487 -10.366257329 -1.655069562 -1.019508911
## [11] 5.168004702 -0.398562387 1.219710861 -7.004910858 -1.542167284
## [16] 4.610095815 4.150336538 -1.209192914 -1.144298072 -2.048560443
## [21] -1.689890767 2.875547689 0.937132047 1.832464699 0.528640903
## [26] -3.249044614 -2.313875557 -6.562604208 6.836219250 1.359529501
## [31] 2.977612995 -3.503214447 6.487566929 -3.920348394 12.571347286
## [36] -5.471280661 -4.229550679 -13.160270586 4.218580124 6.424797915
## [41] -2.908051776 -5.128112710 -3.269008360 8.176359582 12.788348611
## [46] 3.880204670 -4.478672805 -8.753770441 -3.866041808 2.286274290
## [51] -4.270154196 3.871759343 -22.497324002 -17.953010833 -22.374486744
## [56] 1.688145270 -0.183399465 0.105611860 -1.770794879 -0.202225793
## [61] -1.998092037 1.620885700 0.580797225 1.953266958 -0.818175299
## [66] -1.416438678 0.557605783 -0.940680139 1.901527206 -0.014466672
## [71] -1.101082284 -1.062959344 -3.512460157 1.572414434 -0.778479464
## [76] 2.168659150 0.008762614 0.843821842 -3.243460580 -0.063489027
## [81] -1.153401220 3.997620186 -0.672365073 0.552252049 -2.956898920
## [86] 1.221632850 -0.465727648 1.677803307 -1.900926016 -0.574015444
## [91] 1.907854641 3.144603762 1.734740297 -0.060579265 -0.954174046
## [96] -6.723568246 -1.239566228 -3.865147851 1.467199520 -7.816149453
## [101] -3.595188985 3.899297858 0.173471920 -0.104998889 -5.972133966
## [106] 1.133472854 2.990882735 6.291569199 1.403177965 -0.070991110
## [111] -8.371795410 0.446731522 -3.643820571 -0.609901480 -0.570409288
## [116] 2.967318260 10.731509348 1.555300175 1.290956137 -4.010607892
## [121] -1.364923112 -0.288382899 -4.634343648 1.888286888 -2.194339794
## [126] 0.199432337 -2.754814529 1.604102208 0.072172071 5.679306862
## [131] 4.393518232 3.530253087 -3.602957558 -5.899959582 -1.108702224
## [136] 1.289558306 1.482057856 -3.806528102 -1.533428842 -3.286153211
## [141] 1.454827198 -2.009755849 2.543639102 0.540526681 4.590657474
## [146] -2.206024726 2.630221434 -1.207292456 2.124354467 -3.451765850
## [151] -3.923492113 -0.041491686 -3.140712610 0.001687612 -1.947112095
## [156] 6.517891960 4.756360495 54.881271259 47.399694585 51.401656839
## [161] -2.098572904 6.321290543 -4.620987252 0.787050379 -4.011114321
## [166] 4.260840236 2.351637866 -5.534966514 -2.473947633 -3.886879977
## [171] 8.586119263 1.120299938 -1.354107520 -1.670589479 1.718738638
## [176] 2.089996652 -2.027478026 -3.049081530 -2.092002954 -0.017697746
## [181] -3.987017621 0.441131118 -3.538811073 -0.462336620 0.032038856
## [186] 3.230540862 4.530580462 0.017060944 -0.535519962 1.322671852
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##	[191]	2.839559121	3.306333162	-0.200173481	-81.677878416	-78.630940208
##	[196]	-83.960837249	0.728115646	-7.079864301	4.249840457	-4.050921812
##	[201]	4.630123088	-3.123346012	1.695531640	-3.384581862	-1.488924837
##	[206]	-4.554184166	2.084045740	6.971775886	2.145618000	2.166842320
##	[211]	-6.504017316	3.550348633	-3.625684702	3.877729107	4.916098260
##	[216]	-6.181199166	0.898647630	-1.288126554	10.413735655	43.147231788
##	[221]	42.102767654	41.701691099	-2.018328441	-1.955101895	1.739789163
##	[226]	2.255721913	0.360026222	-3.204376703	-2.298571026	0.597195429
##	[231]	-0.377581439	0.110510926	0.680309227	5.924879304	-2.778507743
##	[236]	-4.092029456	-0.023966087	7.353525297	7.501037665	-1.991431868
##	[241]	-6.571353826	-3.399387869	-3.875038687	2.254133459	1.215376545
##	[246]	3.777423069	-2.289263803	-0.472111618	2.421129098	4.102260000
##	[251]	0.187846764	-3.288475666	-0.657243139	-0.464880583	-1.473775596
##	[256]	0.562751139	-12.503587796	-12.370257937	-11.335493141	-4.976989695
##	[261]	-1.117326718	-1.465470412	2.546662692	-0.542716998	-6.865262968
##	[266]	1.627276433	3.136981393	9.862811370	-2.207761254	-2.155744985
##	[271]	-6.254157592	-0.509270859	0.248395393	0.805649826	6.052371442
##	[276]	0.909057282	-3.740699633	-4.672617621	-2.654939414	5.295701796
##	[281]	-4.206820091	4.664650829	-1.042291596	3.678544157	-6.472480392
##	[286]	-3.326454660	0.281916759	-0.289437027	-0.776051241	1.465376953
##	[291]	5.920122909	1.948737143	-9.748676723	-5.683350350	-3.807094720
##	[296]	10.354784348	2.185528695	1.772526782	6.699260658	8.867309312
##	[301]	7.617726485	-9.565097205	-8.186047651	-3.830334995	-0.665651145
##	[306]	3.133882476	-1.116055294	-3.355233599	-2.116769539	0.951897815
##	[311]	-36.180051789	-31.271395179	-36.874352195	4.543039381	0.196151431
##	[316]	0.476891678	0.166464165	-4.340850352	1.352297800	0.838764635
##	[321]	0.994978823	-4.409152964	3.215874737	-5.076489149	5.359051110
##	[326]	-4.163226961	-3.284917213	-1.714186264	7.579281657	-0.751499273
##	[331]	2.152545438	-4.231837165	3.471812204	-4.172283144	-5.910173796
##	[336]	8.715203832	-1.775134671	-4.873788395	-3.241213724	7.351587217
##	[341]	4.993925317	-2.502365557	-7.744172185	5.980888036	-1.802069598
##	[346]	0.238705125	-2.670759775	7.080303818	0.678663059	-0.312637916
##	[351]	-5.170562569	1.792986209	2.714696095	-4.218194840	1.713871055
##	[356]	-0.910902041	2.807289620	-3.088353977	3.384257935	4.146680682
##	[361]	2.764968680	-4.526292821	1.242849388	0.755545481	-2.639048258
##	[366]	-7.442721817	78.862512295	81.607154334	83.290011025	0.548197038
##	[371]	0.264393065	-0.641872993	-2.079475989	-0.237904654	4.293636952
##	[376]	2.871046930	2.015451671	-4.808480411	-2.920259462	-0.822351510
##	[381]	-1.125244999	1.327032797	-2.128118602	4.195192184	-0.704514759
##	[386]	-1.000552060	0.839717002	-0.561001163	1.243426372	-2.146230001
##	[391]	1.860207692	1.455661487	-2.239841821	-0.837168028	1.706156683
##	[396]	3.358344735	1.217125081	-6.993894348	-0.851164348	-3.842700224
##	[401]	9.377375591	-0.739073156	3.652063017	-4.955364937	2.586893018
##	[406]	-2.425913543	0.691637915	-0.139331890	2.115846878	-0.658468563
##	[411]	-4.520026926	2.897836190	-2.571380380	-5.076539492	-5.018132793
##	[416]	5.342639159	9.283013208	-0.916455428	-3.859213328	-0.569237204
##	[421]	0.118542266	1.076957270	-0.434395065	6.066930969	-60.165736211
##	[426]	-65.723088555	-69.544053221	-12.311838151	-0.744073030	6.563063320
##	[431]	12.091188480	1.583899475	-7.920481691	-3.460193393	-0.258236445
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##	[441]	8.471651021	-4.557343400	-3.948821071	-11.469261334	8.148455170
##	[446]	5.553576225	6.612840863	-4.637619013	-5.261268539	-6.355629619
##	[451]	5.641123269	1.379021647	11.269178328	-8.890108092	2.990234736
##	[456]	-10.175038426	0.323066856	-0.337547080	-0.025001725	1.577329652

##	[461]	2.394994347	-1.557168774	-7.712741289	-2.548305388	6.860477419
##	[466]	3.690544396	5.170821556	-6.876801159	1.197739554	0.011915823
##	[471]	6.653003630	6.803462772	-4.008687825	-2.954646284	-5.181198379
##	[476]	-20.989232625	-22.407215987	-19.839468156	2.229363548	0.593980457
##	[481]	0.721164549	-12.603369231	5.315023196	-1.665360538	7.751203321
##	[486]	-5.278009098	1.593645936	5.407182591	5.033497270	-0.628750678
##	[491]	-6.194034328	-5.783075070	-1.921205760	1.759411358	-2.088900177
##	[496]	-3.289934720	-6.905141434	1.610654874	3.012887692	9.401449371
##	[501]	-0.673696688	2.610288990	-0.456509058	-5.257188721	3.092315221
##	[506]	-1.670392673	5.132114036	-7.887919784	2.518308042	-3.109431249
##	[511]	-3.617758044	0.121947535	7.439026550	7.744230849	-2.367345307
##	[516]	-8.938734653	-5.608069799	-3.708230541	4.278268439	5.572927607
##	[521]	0.250930200	-6.089218270	-2.928767678	-0.016731846	13.558239632
##	[526]	0.314420639	6.902024541	-4.113168542	94.893450656	89.863923934
##	[531]	88.374785000	3.304271864	-4.308920677	0.607250811	-1.037609884
##	[536]	1.462212363	2.425554939	-2.564587676	1.923284445	-1.397176864
##	[541]	2.045880114	-0.529203698	1.401928520	-0.256378290	-0.076090737
##	[546]	-0.796365179	-1.489583533	0.890917293	-0.313897271	1.786817952
##	[551]	-2.156793376	-0.896495556	-1.847481247	0.293304250	-0.777827885
##	[556]	2.031334677	1.187230647	2.382295289	-0.898556972	1.193148266
##	[561]	0.894737361	0.830236779	-2.194909332	-2.763748566	-2.938734647
##	[566]	0.461209871	0.995684686	1.764912445	1.892569640	-0.963252143
##	[571]	-0.161161282	-3.747178676	-62.422534900	-59.011935041	-57.583724605
##	[576]	-6.148513478	-0.150671015	-5.017591362	2.930117028	-4.855849534
##	[581]	4.443879156	-2.700834024	-1.396491809	-2.371160345	0.683313012
##	[586]	10.648163738	0.121169225	4.523865276	-4.003005744	4.066144979
##	[591]	4.862454578	-6.153527002	-8.707737733	-3.084725331	-0.406332146
##	[596]	3.288275808	-6.293533194	0.755026683	0.973718202	10.431259578
##	[601]	3.411721447	-1.194832309	-11.973744041	-1.651298114	-1.435981628
##	[606]	6.673380730	-3.327387172	5.336961458	-1.213976291	1.674661360
##	[611]	-8.389664531	-0.761554814	5.573049893	12.043975780	-2.856911984
##	[616]	-3.048527480	-4.462942214	10.240932664	-2.161155242	-0.884457098
##	[621]	-21.865703829	-18.464740895	-20.351309504	2.703773533	4.498323164
##	[626]	2.023958735	-7.589431769	-4.448853552	0.674319225	-4.294468593
##	[631]	-3.281503185	-1.943894172	11.047156706	4.054332362	-4.176724752
##	[636]	-4.577656033	-1.233857935	0.491737270	-4.753752514	-1.595193670
##	[641]	4.815603747	3.015228287	2.461223571	-0.350223009	2.328851486
##	[646]	-0.200208489	0.584345629	1.286790426	-0.271438466	-5.181726935
##	[651]	-1.084208822	1.311551140	3.880086950	0.243196197	-1.391767129
##	[656]	-3.152358726	1.333305548	0.279493808	0.801541612	-3.043572303
##	[661]	3.582178738	-0.086143329	0.947068845	-10.011798579	0.402676774
##	[666]	5.864405251	2.405296666	1.777176890	-6.928518668	0.861792729
##	[671]	-2.919714598	-0.949949536	4.408724957	5.573464022	-8.439260232
##	[676]	-17.461693720	-11.768492472	-0.990535760	5.327734288	0.570534685
##	[681]	4.016126328	2.372132869	1.109506116	-3.509165044	-2.285403622
##	[686]	-2.212059117	-1.182977348	-1.990486919	4.644805836	-0.388074950
##	[691]	8.344310426	-9.983503924	2.197717294	-9.103577892	1.858427522
##	[696]	1.941520972	-0.818765148	5.372187013	-3.195407688	5.641930613
##	[701]	-1.386641857	2.040979198	-3.566603462	-3.550896833	-2.576276760
##	[706]	-1.721434396	-0.682543740	4.808708658	0.682763828	2.036750368
##	[711]	96.008063000	102.378965846	95.960562832	-4.241539959	-1.702846241
##	[716]	-1.650930924	1.507495618	-1.989798737	0.514807655	3.177454527
##	[721]	-1.507150840	-3.187207210	-3.944080359	0.017860220	4.892005799
##	[726]	2.690658717	1.191345774	2.074634688	-0.526747082	-0.812120918

##	[731]	-1.374152533	-3.046408145	0.112720627	-5.087282404	2.434899530
##	[736]	-0.089622685	4.596441954	-1.633084734	1.664239904	-2.901492765
##	[741]	-1.356924059	-2.655205483	6.016774472	1.273233666	2.234193061
##	[746]	-5.513014503	1.956526744	-1.518281536	-0.244365851	0.822813894
##	[751]	-1.033931643	0.646699376	-4.477333203	2.854438792	2.115445788
##	[756]	0.215576619	-1.117220692	-2.222559775	4.307533288	-4.391836871
##	[761]	0.270189185	-2.817665792	3.724027764	6.823997676	-77.998873248
##	[766]	-79.447485668	-84.879049924	-3.969177763	4.158454301	-9.142420351
##	[771]	2.664215736	-10.238588621	8.545403142	-2.673733335	9.626183867
##	[776]	6.760835504	4.606085455	2.275378055	-11.426582275	1.003586622
##	[781]	-9.139851233	4.754579918	-4.063388435	-0.429398166	-0.280629995
##	[786]	4.496440658	1.770134909	3.544902275	-1.106066875	0.320752015
##	[791]	3.326201514	6.362006936	-0.094362631	-7.768122899	-5.219442638
##	[796]	1.491166604	-3.810033954	-2.471409072	1.824716247	2.729173074
##	[801]	-2.864679741	5.566202533	6.534825033	2.139295642	-9.012112181
##	[806]	-6.524017429	-2.387039884	2.766471252	1.702794684	1.950729250
##	[811]	2.472115371	0.259083522	-3.589985151	-2.446553551	5.526219822
##	[816]	32.710606297	29.238045585	22.890675147	4.544036998	-2.234161546
##	[821]	2.954249037	-5.631268681	0.077732372	-5.301989711	-2.204974558
##	[826]	11.746625719	6.623667095	-1.393289029	-12.645599020	-10.569173157
##	[831]	3.704118740	-10.626668948	6.429454633	9.402544719	17.580255607
##	[836]	-4.603833165	-14.180935700	-7.558087324	2.835526050	0.619689050
##	[841]	-8.464188185	-5.249717167	7.508580905	11.396116600	2.908812311
##	[846]	-2.456814444	4.603275689	8.438666827	0.800916220	-3.589757155
##	[851]	-4.313981714	0.580855555	8.250873838	9.574028913	-0.147451076
##	[856]	-6.305649216	-14.342206858	0.586665134	3.775691146	-0.609776534
##	[861]	2.732522836	-4.412969003	10.639757136	-11.196552103	-0.036892412
##	[866]	-1.022813150	3.377005300	3.136807607	-13.049757888	-0.816311584
##	[871]	-16.112122389	10.065379492	0.456386184	-0.495189834	-17.985030594
##	[876]	-14.875891834	-12.809389459	1.403159315	-2.766386803	9.059207982
##	[881]	-4.686312170	1.752260856	-4.628857111	1.807095925	-1.024211991
##	[886]	-2.039871381	-0.895166286	2.567991324	3.741854200	3.186037787
##	[891]	-3.913296143	3.101140278	-3.219419743	-0.146769448	-0.140305233
##	[896]	1.786052351	6.612863541	-6.124023872	-0.939415838	-1.385041407
##	[901]	2.358835952	-2.155208574	-4.713189052	0.795859015	-0.184030933
##	[906]	2.988020341	1.414406103	3.138042962	-6.032499654	1.173084353
##	[911]	-9.805581503	4.371274040	0.895203149	4.631317868	1.602132053
##	[916]	-3.680607506	8.488050860	-4.598100885	-1.096765058	-5.860915293
##	[921]	3.857290578	-4.484853519	-0.940567757	3.998761105	5.251670694
##	[926]	-4.276797172	-4.154461915	-3.885478347	9.173878249	0.654983587
##	[931]	3.633949947	64.636102807	62.769517986	65.863634124	-0.814830698
##	[936]	1.898625306	-1.493380820	-6.464041963	5.040647589	3.725818144
##	[941]	0.854661750	-6.132760967	-7.898519266	4.979321782	0.477582797
##	[946]	5.045213958	1.082395338	-0.731854681	-1.472847224	-4.808273210
##	[951]	4.865479076	2.293744795	4.529096692	-1.348579676	-0.373441045
##	[956]	1.407260381	0.548762534	-1.052012616	-8.599002385	-0.545741982
##	[961]	0.095642767	5.955231510	1.335330762	2.055009996	-3.444100963
##	[966]	-9.155986468	1.749266927	1.128463637	9.305562086	-6.426902054
##	[971]	1.633809909	-3.053970422	-0.757971483	-0.481769094	2.513822647
##	[976]	8.182980749	-7.271714157	-0.359259376	-5.021044968	10.051051374
##	[981]	-10.990869816	-0.201956373	-2.597970211	-57.198772021	-61.248816550
##	[986]	-62.443469733	-3.544915653	-3.183217510	-4.937300768	1.663964037
##	[991]	-7.440000341	6.862885150	2.930991666	11.673412635	-10.264951241
##	[996]	-2.127777802	-11.512046613	7.467319129	-1.398581240	8.231858315

## [1001]	-5.224720404	-2.367094928	-3.703978405	-4.176728605	13.519746028
## [1006]	3.453523904	6.370125690	-16.287726089	0.343683324	-6.038778398
## [1011]	7.175954643	-0.456578326	3.081962884	10.954149425	-4.124259503
## [1016]	-3.085484495	-17.201210415	3.076905173	10.786670384	1.015889696
## [1021]	9.168730590	-11.840696106	6.272515865	-20.343742496	4.524586803
## [1026]	-4.440819996	8.352804565	0.831111377	2.609755269	6.645431877
## [1031]	5.704420599	7.004302148	3.888030680	-2.556782068	-9.746011985
## [1036]	-8.402495402	36.945544262	40.631225625	37.429414813	-0.142269916
## [1041]	-0.300109502	-1.838397314	-1.562726411	1.251344484	2.802053246
## [1046]	2.099448997	0.708784282	-1.410788394	-0.704374213	-2.091511303
## [1051]	-1.460195599	0.525899462	0.516131951	1.056219636	-0.485011654
## [1056]	0.042992026	0.843012598	0.484139709	-0.761931334	-1.103525440
## [1061]	0.069312445	-0.297396775	1.086962193	-1.616526697	0.692296599
## [1066]	0.028412694	2.500403277	1.921025023	0.231550151	-2.151619028
## [1071]	-0.741939463	-0.058481953	-0.649120778	0.148514496	-0.690961850
## [1076]	1.287924961	0.046404698	1.282118341	0.420178152	-0.694959442
## [1081]	-2.442475700	-2.705275508	-0.729321512	2.151111598	-0.066172338
## [1086]	-1.445609988	-2.236955396	2.457945857	1.041754033	1.960245333
## [1091]	0.438150063	0.095439283	4.632538023	7.792529158	11.976957319
## [1096]	2.565217845	3.417265629	-1.928836608	2.948192607	-4.661574330
## [1101]	-3.473901724	-1.679853424	-0.726566055	2.815024470	1.284336529
## [1106]	1.908710890	0.980948057	1.230128563	0.506500541	-0.229502883
## [1111]	0.874970947	-0.540777663	-1.455930425	-4.129579163	0.699720604
## [1116]	2.207058571	0.615256368	0.130352853	-1.993291405	-1.480536416
## [1121]	-3.402694462	-0.123692731	4.341490759	4.393478750	-1.085172523
## [1126]	-4.593447922	-0.549185770	1.774950115	0.275681236	0.507461075
## [1131]	-0.032833072	0.918402193	-0.303273878	-35.276998936	-23.988697470
## [1136]	-16.018817126	11.735940674	-7.264754018	-13.681293883	-3.732125287
## [1141]	2.618007225	-2.541158757	1.663288142	4.251283268	9.387951748
## [1146]	2.883718389	3.946625638	-1.535702455	-2.848779310	-7.742503180
## [1151]	-4.441975913	-0.762893187	2.308485393	-8.626416504	-5.172931841
## [1156]	-0.074395231	11.130420165	4.129813557	5.027882533	-2.102868110
## [1161]	1.519015441	19.066546113	25.792896478	27.045131444	-0.844868443
## [1166]	-1.579303831	-10.362143989	0.833180240	-6.456934328	4.541054180
## [1171]	-1.490408410	10.745549748	-11.711170902	-4.562151657	-7.423948387
## [1176]	7.617422016	3.361928395	-4.168311319	5.366480053	2.875762421
## [1181]	8.593727776	5.874333473	4.612874840	-4.807745677	0.100915433
## [1186]	-9.650549295	-3.071913490	-7.366241017	5.468570693	5.801474415
## [1191]	-0.149767334	-2.559922357	1.048316732	-3.712334436	-5.708841750
## [1196]	-8.069435651	-1.459599014	1.898909890	7.635044123	2.809762367
## [1201]	-4.301066635	-1.779136582	6.400385790	2.887573408	-1.743389687
## [1206]	-2.271934996	5.295740133	-0.126227231	2.750915186	0.546264344
## [1211]	6.374628116	-7.140911479	1.062750149	-0.287859559	9.648109368
## [1216]	0.327375580	-2.193760215	-7.262327246	-0.629686383	-13.237262262
## [1221]	-16.177800724	-16.113235679	-5.343558683	4.130378664	-0.735830667
## [1226]	2.122520634	-1.229689670	-2.249647217	2.148085663	0.089740375
## [1231]	2.618159441	2.657197073	-2.493977495	4.415528744	-2.023577436
## [1236]	-1.235360967	-1.004513519	-0.352092098	7.260948982	-2.520566172
## [1241]	-0.529857227	-5.095633807	0.948513475	-0.831539681	4.311506299
## [1246]	-0.087882037	1.645188851	0.550667719	-1.250283187	-3.292544928
## [1251]	-1.015475584	3.614764736	3.275306882	-0.888936668	-3.970634703
## [1256]	0.214209044	-1.999439004	5.568310861	-1.918878480	-1.625817848
## [1261]	-3.766274157	-1.018988550	3.759427330	-1.793631895	2.151578268
## [1266]	-2.618674879	-1.683974243	-16.005237458	-17.406007054	-15.852161423

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## [1271] -2.649548915 0.665066769 -0.706929205 -8.587180722 2.368106898
## [1276] 1.761970495 4.785673721 -5.553065993 -5.303399712 3.256712441
## [1281] 3.978169532 2.280363561 -1.632455726 -3.123177127 1.281832064
## [1286] 0.663664528 3.421780773 1.298498015 1.190839129 -4.320327099
## [1291] -4.699752400 5.034838162 -3.356860724 1.470466861 -7.684350662
## [1296] 5.529215393 -1.845287173 1.023289795 0.738532309 6.480607297
## [1301] -1.497447063 -3.575778289 -2.144691309 0.990000321 2.141002835
## [1306] -2.077931762 -1.217763189 0.499047170 1.770449591 4.316574159
## [1311] -0.348953395 3.051066480 0.588857050 2.493711323 -2.500703060
## [1316] -0.782654943 -5.560741931 -0.505268822 -0.727732214 6.555446544
## [1321] 0.304214861 0.105070729 -4.710176873 -0.125047830 4.571892766
## [1326] 1.068154231 -1.315871176 -5.593021197 1.836754701 1.492764776
## [1331] -2.954745657 -3.402769511 -1.002850193 0.100202119 5.156289560
## [1336] -2.030222855 3.474530294 -2.835907430 2.083648752 -3.209476515
## [1341] -24.042675650 -21.530985679 -21.449463058 2.208748389 -4.332726255
## [1346] -1.167439986 -2.247975951 -1.604901636 -1.031019642 -0.399042695
## [1351] 4.613512123 3.005018668 0.256869301 -1.379477338 1.632628934
## [1356] -3.612132218 1.708623550 -4.691218491 2.930625301 -0.983723009
## [1361] 2.187980038 1.227272991 -0.989653648 -0.737976267 -3.730437546
## [1366] 3.397299810 -1.059155116 2.803559655 -2.857907943 2.644606104
## [1371] 0.514022178 0.304819580 -0.169586105 2.086609582 0.299205511
## [1376] -1.904081936 -2.137260205 -2.364647588 -4.182608488 0.900131003
## [1381] 2.830738038 4.033532082 0.687117925 -0.391086954 -0.278512672
## [1386] -1.501299252 -0.150945232 -1.575760324 0.413754265 -0.263209506
## [1391] 4.581482048 -4.965306806 -2.319493093 -2.863996000 1.808038788
## [1396] 3.164384649 -0.708118317 0.042867564 -0.471677099 1.997968156
## [1401] 0.722696261 0.453285035 -0.049022828 3.258528369 -2.262658038
## [1406] -0.582872641 -4.648273517 2.028826559 -0.656909967 2.586858862
## [1411] 1.644401137 3.583429459 0.266672155 -4.272353673 -1.201972185
## [1416] 4.338877218 -1.477165796 -0.995335741 -4.645245386 7.103697502
## [1421] 0.719808267 2.287416173 -4.702134705 5.215451684 2.632693821
## [1426] -0.706931396 -5.704154144 -5.139991408 5.542749011 0.536374203
## [1431] 1.881073936 -6.429960085 -1.535900665 -7.607908647 3.168238252
## [1436] 1.759956310 7.857073657 0.250292568 -0.231121335 0.954854946
## [1441] -2.852657047 -2.939348529 -3.932060064 1.625670217 -0.573328525
## [1446] 5.603151992 1.032072209 1.760839271 -7.885463899 -2.571590937
## [1451] 4.718354944 33.003748385 28.655775579 13.621898380 1.461205669
## [1456] -6.691546082 5.005334347 -8.948826628 6.895522521 0.498915480
## [1461] -6.005723290 -1.911019605 -1.271862712 4.269315714 -5.911058952
## [1466] 1.979206329 2.358265127 0.778280221 -0.446214485 2.221454581
## [1471] -5.098892887 -2.006229957 -5.479291058 10.762933045 4.295630463
## [1476] -3.274146537 -2.936692514 -12.491908267 4.992902468 2.662178034
## [1481] 8.844531800 -4.935358910 3.576526758 1.659155322 9.293161436
## [1486] -11.778100560 5.446289968 -8.879688950 4.317095023 -3.493150296
## [1491] -1.736848269 3.148388317 1.642400041 11.479895108 -2.880779839
```

```
diff(binary_data$x, lag = 5)
```

```
## [1] 1.351469e+00 -4.046628e+00 3.791212e+00 6.348766e+00 -3.739395e-02
## [6] -5.027877e+00 1.760317e-01 -9.557449e+00 -3.799486e-01 1.666004e+00
## [11] 2.028520e+00 -5.729790e+00 1.143345e+00 1.470611e+00 -1.180891e+00
## [16] -1.285558e+00 7.331223e+00 -1.687284e+00 -7.585545e+00 6.056435e+00
## [21] 4.590408e-01 -4.608782e+00 8.633636e+00 -1.100113e+00 -9.798205e+00
## [26] 1.133900e+00 3.903642e+00 -8.967317e+00 7.360557e+00 2.714303e+00
```

```

## [31] 4.082854e+00 -3.396010e+00 1.392612e+01 -4.366039e+00 -4.122347e+00
## [36] -5.721717e+00 3.772889e+00 -1.026890e+01 -3.158488e+00 2.874327e+00
## [41] -3.776337e-01 7.992913e-01 9.237878e+00 6.410623e+00 1.448731e+00
## [46] 3.753116e+00 -5.631779e+00 -9.053343e+00 -4.397243e+00 2.718653e+00
## [51] -2.279690e+01 -1.848421e+01 -2.194211e+01 -1.683860e+01 -2.253937e+01
## [56] 6.608283e-01 -6.563813e-01 -3.671100e-01 -3.025409e+00 1.147904e+00
## [61] 1.080753e-01 6.986528e-01 5.319544e-01 6.897287e-01 -3.646271e-01
## [66] -9.895230e-01 6.379890e-01 4.390816e-01 -6.741666e-01 -9.825762e-01
## [71] -2.132698e+00 -1.003279e+00 -1.746589e+00 1.137043e+00 6.844257e-02
## [76] 2.609693e+00 -3.678832e+00 7.834330e-01 -7.123673e-01 3.100255e-01
## [81] -7.327539e-01 3.083345e+00 -2.583384e+00 1.642280e+00 -1.380003e+00
## [86] -2.332160e-01 -8.108979e-01 1.002881e+00 4.530058e-01 2.799434e+00
## [91] 1.059818e+00 2.293353e+00 2.419275e+00 -7.571605e+00 -2.090817e+00
## [96] -3.180613e+00 -6.043826e+00 -8.952793e+00 -5.223398e-02 -9.049621e-01
## [101] -4.914173e+00 -1.624432e+00 9.390534e-01 -1.855112e-01 -2.532848e+00
## [106] 7.057151e+00 1.322666e+00 3.368295e+00 -2.448118e+00 -1.221486e+00
## [111] -6.567094e+00 -4.461197e+00 -1.720904e+00 4.772019e+00 5.823581e+00
## [116] 3.478217e+00 6.672877e+00 2.383382e+00 -8.540244e-01 -4.347015e+00
## [121] -3.806262e+00 -2.566936e-01 -2.530747e+00 -2.241906e+00 -2.723125e+00
## [126] 3.707699e+00 -4.058021e+00 5.150521e+00 7.901784e+00 2.227047e+00
## [131] -5.653839e-02 1.929653e+00 -4.560962e+00 -3.160498e+00 -1.185424e-01
## [136] -4.764533e+00 1.206032e+00 -2.295993e+00 -4.599264e+00 -2.285781e+00
## [141] 4.054174e+00 -2.525309e+00 5.591029e+00 3.933219e-01 2.114669e+00
## [146] 1.840098e+00 1.977150e+00 -5.927755e+00 1.226305e-01 -6.945635e-01
## [151] -7.861175e+00 -2.000036e+00 8.100903e-01 2.580209e+00 2.797816e+00
## [156] 5.883207e+01 4.997822e+01 5.614658e+01 5.021561e+01 5.154315e+01
## [161] -3.355674e+00 3.602965e+00 -3.869625e+00 3.003739e+00 -3.666876e-01
## [166] -4.783604e+00 -2.572587e-01 -2.424532e-01 -4.583251e-01 -1.488597e+00
## [171] 3.938406e+00 3.450331e-01 4.117022e+00 -2.557717e+00 -2.802745e+00
## [176] 2.422048e+00 -2.979130e+00 -4.539181e+00 -3.654966e+00 -5.105212e-01
## [181] -5.028911e+00 -2.025300e+00 -4.607846e-01 2.188648e+00 2.064149e+00
## [186] 3.095087e+00 2.115464e+00 3.354782e+00 2.704106e+00 8.912170e-01
## [191] 3.137548e+00 -7.843825e+01 -7.906240e+01 -8.366285e+01 -8.101647e+01
## [196] -8.594209e+01 2.264870e+00 -6.436452e+00 2.648874e+00 -1.586591e+00
## [201] 2.338944e+00 -4.985548e+00 9.754058e-01 -6.845363e+00 2.218439e-01
## [206] 6.251650e+00 -1.315163e+00 3.877611e+00 4.301817e+00 1.511396e-01
## [211] -6.719850e+00 6.033928e+00 2.900395e+00 -6.397031e+00 3.382227e+00
## [216] 5.237954e+00 1.389752e-01 4.161336e+01 5.352192e+01 4.094202e+01
## [221] 4.088316e+01 4.115308e+01 -4.654240e-01 1.036113e+00 -1.885820e-01
## [226] -1.651472e+00 6.926438e-01 -1.331176e+00 -4.284776e+00 4.431285e-01
## [231] 2.553510e+00 3.938675e+00 -2.932575e+00 -1.160938e+00 3.804198e+00
## [236] 3.740641e+00 4.152206e-01 4.591274e+00 1.261317e+00 -2.960201e+00
## [241] -6.637290e+00 -3.985587e+00 2.466072e-01 3.711486e+00 -2.875463e+00
## [246] 3.649534e+00 3.878482e+00 1.142033e-02 5.995797e-02 2.879270e+00
## [251] -1.737112e-01 -2.826052e+00 -2.696765e+00 2.011932e-01 -1.204116e+01
## [256] -1.440978e+01 -1.066942e+01 -1.554438e+01 -1.608986e+01 3.686980e-01
## [261] -6.274573e-01 -5.297082e+00 -1.519575e+00 2.117146e+00 -6.946300e-01
## [266] 5.796573e+00 4.521016e-01 4.014888e+00 -2.084861e+00 -3.194151e+00
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## [276] 9.295275e-02 -1.896902e+00 -3.059548e+00 -5.022925e+00 6.508448e+00
## [281] 5.707781e-01 1.310559e+00 -5.259734e+00 1.451144e+00 -3.072175e+00
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## [291] -4.593557e+00 -1.676011e-01 -6.609103e+00 -1.588960e-01 6.919047e-02
## [296] 4.912100e+00 1.222371e+01 1.274359e+01 2.175042e+00 4.730891e-01

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## [321] 2.754015e+00 -4.273543e+00 1.603790e+00 -2.404191e+00 -3.149307e+00
## [326] -3.326271e+00 1.025158e+01 -9.259857e+00 2.989502e+00 9.304660e+00
## [331] -4.073859e+00 -8.762063e+00 4.145986e+00 2.488800e+00 -6.305361e+00
## [336] -4.199615e+00 3.419869e+00 6.956400e+00 -7.920894e+00 2.692638e+00
## [341] 4.086017e+00 1.301208e+00 -6.461019e+00 -6.692036e-01 1.132814e+00
## [346] 8.363457e+00 -5.971429e+00 2.622246e+00 2.954190e+00 -1.507683e+00
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## [391] -8.142387e-01 3.533544e-01 2.405900e+00 6.838984e-01 1.148180e-01
## [396] -2.348152e+00 6.699020e-01 -5.434039e+00 3.670879e+00 -1.286296e+00
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## [406] 1.351902e+00 4.798412e-01 -2.247973e+00 -7.422112e-01 2.686039e+00
## [411] -4.680021e+00 -7.934598e+00 -1.673625e+00 5.182645e+00 -1.549421e+00
## [416] -1.869985e-02 6.399971e+00 2.899475e+00 -5.242797e+00 -1.806085e+00
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## [426] -7.328003e+01 -6.927110e+01 7.911366e-01 4.534250e+00 1.856853e+00
## [431] 5.182493e+00 1.818130e+00 -4.964447e+00 -1.232032e+01 1.301779e+00
## [436] 4.351733e+00 2.129867e+00 7.535733e-01 1.823500e+01 -3.495025e+00
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## [476] -2.296393e+01 -1.845966e+01 -1.898898e+01 -1.253533e+00 -8.655816e+00
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## [531] 8.806388e+01 -1.139639e+00 1.553932e-02 1.151304e+00 -2.018356e+00
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## [696] 3.895020e+00 1.440877e+00 3.605569e+00 5.668569e-01 4.300621e+00
## [701] -5.333221e+00 2.113678e-01 -3.917586e+00 -5.668014e+00 -2.512155e+00
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## [736] 2.341320e-01 4.332595e+00 -2.930245e+00 -1.033169e+00 -2.919052e+00
## [741] 4.719614e+00 -1.424176e+00 2.216634e+00 5.635233e-01 3.187557e+00
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## [756] 1.283502e+00 1.519729e+00 -6.011738e+00 1.338114e+00 -1.807166e-01
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## [766] -8.148096e+01 -8.244837e+01 -9.350353e+00 6.307429e-01 -7.807907e+00
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## [776] 4.690672e+00 -1.492001e+00 2.063212e-02 -1.121001e+01 -1.343506e+00
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## [796] 3.316120e+00 1.522646e+00 -5.075153e+00 -1.039727e+00 1.089888e+01
## [801] 3.931082e+00 -7.251472e-01 -8.424030e-01 2.717438e-01 -8.678390e+00
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## [831] 4.648614e+00 1.085156e+01 1.098953e+01 -3.659338e+00 7.297298e+00
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## [911] 3.019236e+00 1.965169e+00 -3.290060e+00 9.144210e+00 6.081946e+00
## [916] -8.783364e+00 3.416127e+00 -1.381101e+00 -1.245466e+00 -9.556777e+00
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## [931] 6.623876e+01 6.321140e+01 6.663821e+01 6.450344e+01 -2.918083e+00
## [936] -2.595348e+00 3.680450e+00 1.622566e+00 -3.639312e+00 -9.589301e-01
## [941] 1.880890e-01 -3.700637e+00 -4.207165e+00 4.378641e+00 3.514519e+00
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## [971] -1.741262e+00 -3.915319e+00 5.510502e+00 4.807909e+00 -8.133063e+00
## [976] 5.909214e+00 2.686335e-01 -5.958342e-01 -1.326464e+01 7.338391e+00
## [981] -2.834545e+00 -6.544236e+01 -6.396148e+01 -5.428714e+01 -6.878532e+01
## [986] -6.454672e+01 -2.025674e+00 -5.872542e+00 -9.543255e+00 8.382127e+00
## [991] 2.416672e-01 7.067459e+00 -3.546788e+00 5.553890e+00 -1.130747e+01
## [996] 9.895393e-01 -7.518104e+00 7.189337e+00 -2.107403e+00 1.626848e+00
## [1001] -3.981961e+00 -4.885551e+00 6.914735e+00 4.696283e+00 3.851670e+00
## [1006] -5.669012e+00 9.216695e+00 -1.570685e+01 -1.946582e+00 2.389991e+00
## [1011] 3.662835e+00 8.663884e+00 4.304510e+00 -6.598605e+00 -8.080748e+00
## [1016] 4.299452e+00 -6.766084e+00 -2.940598e+00 1.655367e+01 -1.405569e+00
## [1021] 2.550122e-01 -1.457675e+01 2.103128e+00 -1.335454e+01 5.616755e+00
## [1026] -3.338277e+00 9.598959e+00 7.737600e+00 6.806964e+00 8.250457e+00
## [1031] 1.079452e+01 1.640427e+00 -8.140987e+00 -3.312396e+00 3.158167e+01
## [1036] 2.860221e+01 3.667380e+01 4.118541e+01 3.670459e+01 -2.110141e+00
## [1041] -1.008541e+00 5.265236e-01 8.341822e-01 1.391017e+00 3.073705e+00
## [1046] 9.861202e-01 -5.647015e-01 -1.819859e+00 -2.573524e+00 -7.475863e-01
## [1051] 1.070610e-01 -8.129305e-01 8.589133e-01 1.610249e+00 -4.958174e-01
## [1056] 8.269211e-01 -2.079023e-01 -1.114331e+00 8.532415e-01 -1.348312e+00
## [1061] -5.115087e-01 -1.353882e-03 4.475103e-01 -5.524084e-01 2.796446e+00
## [1066] 1.281573e+00 1.295668e+00 -4.746946e-02 5.112210e-01 -1.263217e+00
## [1071] -2.617615e+00 4.281854e-01 1.974404e-01 -5.877508e-01 5.330720e-01
## [1076] 2.128679e+00 -3.160872e-01 5.290744e-01 -1.601721e+00 -3.067767e+00
## [1081] -1.482365e+00 1.292123e-01 -2.438980e+00 -4.854997e-01 5.975324e-01
## [1086] 7.482871e-01 -1.594857e+00 2.623950e+00 2.632047e+00 7.375374e-01
## [1091] 4.798542e+00 9.382822e+00 1.075425e+01 6.925610e+00 1.270465e+01
## [1096] 4.192875e+00 2.081273e+00 -3.933883e+00 -1.846245e+00 -3.015846e+00
## [1101] -2.731612e+00 -1.979413e+00 2.930065e+00 2.651000e+00 6.813885e-01
## [1106] 4.886760e+00 3.424762e-01 -8.324509e-01 3.853020e+00 -1.179250e+00

```

```

## [1111] -3.518510e+00 -7.830598e-01 -2.500260e-01 -2.186422e+00 3.729742e-01
## [1116] 1.336257e+00 -5.013450e-02 -1.807283e+00 -4.273496e+00 -7.890836e-01
## [1121] 2.403855e+00 2.113274e+00 -3.937197e-01 1.213102e+00 1.687781e+00
## [1126] -2.960260e+00 -2.904696e+00 3.280415e+00 1.600354e+00 -1.437108e+00
## [1131] 1.202191e+00 -3.395233e+01 -2.593327e+01 -1.478379e+01 -2.313479e+01
## [1136] -3.289475e+01 6.811912e+00 -2.878215e+00 -1.425792e+01 -7.465187e+00
## [1141] 6.049827e+00 3.674655e+00 5.654890e+00 6.315538e+00 1.016244e+01
## [1146] 2.455899e+00 -7.845243e-01 -6.968016e+00 -4.869795e+00 -5.494043e+00
## [1151] -3.123828e+00 -1.064743e+01 -2.924472e+00 1.243753e+00 1.245881e+00
## [1156] -1.103144e+00 1.489805e+01 4.315945e+00 4.902671e-01 2.283418e+01
## [1161] 2.597903e+01 2.250752e+01 2.409218e+01 2.288071e+01 -6.921174e+00
## [1166] -8.675386e-01 -1.062136e+01 -1.535251e+00 -7.786432e-01 1.048634e+01
## [1171] -1.407960e+01 1.116139e+00 -1.478666e+00 -4.971772e+00 -6.267482e+00
## [1176] 6.064193e+00 4.956860e+00 4.032229e+00 7.040499e+00 7.469265e+00
## [1181] 1.281342e+01 -3.133727e+00 4.694418e+00 -5.430862e+00 -1.207997e+01
## [1186] -7.284698e+00 4.845454e+00 -6.379415e+00 2.216084e+00 5.357445e+00
## [1191] 2.035143e+00 -6.964821e+00 -6.152871e+00 -5.884525e+00 -5.864498e+00
## [1196] -5.302278e+00 5.462853e+00 2.654106e+00 -1.533909e+00 5.143316e+00
## [1201] 7.155582e+00 -6.281379e+00 5.901636e-01 9.184714e+00 7.934975e-01
## [1206] -5.936449e+00 9.048055e+00 3.083152e+00 2.710114e+00 -3.388596e+00
## [1211] 4.272129e+00 -3.286611e-01 5.713249e+00 -1.775124e+00 4.618490e+00
## [1216] -2.611829e+00 -2.116950e+00 -1.826688e+01 -1.911700e+01 -1.603643e+01
## [1221] -1.634811e+01 -1.435694e+01 -3.534994e+00 1.952208e+00 5.266061e-01
## [1226] -4.410829e-01 -3.008453e-02 1.352177e+00 5.455595e-02 3.856802e+00
## [1231] 1.107847e+00 2.321999e+00 1.743484e+00 -2.745674e+00 -1.339712e+00
## [1236] 3.885370e+00 9.974672e-02 -1.836700e+00 4.590874e+00 -3.991374e+00
## [1241] -5.360947e-01 -3.501615e+00 2.840699e+00 -9.411953e-02 3.239208e+00
## [1246] 2.442853e+00 -5.128630e-01 -4.364844e+00 1.515260e+00 1.456713e+00
## [1251] -1.640205e+00 1.876606e+00 7.786231e-01 -4.105199e-01 -3.737598e+00
## [1256] 3.071627e+00 -1.440462e+00 -1.392781e+00 -9.088561e-01 -4.600113e-01
## [1261] -3.201664e+00 -7.836096e-01 3.317385e+00 -2.054065e+00 -1.448595e+00
## [1266] -1.644728e+01 -1.766644e+01 -1.945233e+01 -1.647815e+01 -1.531740e+01
## [1271] -4.154027e+00 -7.659328e+00 2.902869e+00 2.574927e-01 -3.538721e+00
## [1276] -1.943268e+00 3.541274e+00 -2.650115e+00 2.729314e-01 1.035964e+00
## [1281] 1.270495e+00 2.453154e+00 -9.389168e-01 -2.044010e+00 3.594571e+00
## [1286] 1.992037e+00 2.270006e+00 -2.007588e+00 -3.371380e+00 3.883064e+00
## [1291] -6.662947e+00 -3.091752e+00 5.190402e-01 3.566021e+00 -9.971878e+00
## [1296] 4.899191e+00 2.834087e+00 4.193080e+00 -2.127472e+00 1.103595e+00
## [1301] 1.025099e+00 -1.876004e+00 -3.236009e+00 4.446146e-01 4.820114e-01
## [1306] -5.922706e-01 1.225064e+00 2.657583e+00 1.136708e+00 5.493893e+00
## [1311] 2.747393e+00 1.859970e+00 -1.323384e+00 2.313691e+00 -6.751839e+00
## [1316] -2.417510e+00 -9.077525e-01 2.304311e+00 -1.330640e+00 4.758060e+00
## [1321] -1.900597e+00 -7.279554e-01 2.774506e+00 -1.136658e+00 -2.148897e+00
## [1326] 1.891662e+00 8.251446e-01 -5.228025e+00 -2.131238e+00 -1.261754e+00
## [1331] -6.378543e-01 -3.867790e+00 2.401771e+00 2.866685e-01 3.009509e+00
## [1336] 5.687138e-01 2.270115e+00 -5.356257e+00 -2.144374e+01 -2.273540e+01
## [1341] -2.396981e+01 -2.131864e+01 -2.385865e+01 -1.094577e+00 -2.035630e+00
## [1346] -4.014089e+00 -4.334345e+00 1.898054e+00 1.766863e+00 9.186499e-01
## [1351] 3.759825e+00 1.418405e+00 2.950322e+00 -4.465819e+00 1.220101e-01
## [1356] -1.997766e+00 -1.557168e-01 -2.494342e+00 3.802346e+00 -6.370674e-01
## [1361] 1.207223e+00 1.337445e-01 -3.383782e+00 2.416543e+00 -2.152684e+00
## [1366] 4.094314e-01 2.966111e-01 4.222360e+00 -2.473846e+00 1.660586e+00
## [1371] 1.249214e+00 2.470671e+00 -6.848148e-01 -1.168890e+00 2.859147e-02
## [1376] -2.879876e+00 -7.438108e+00 6.295170e-01 1.854944e+00 -1.267316e+00

```

```
## [1381] 3.681282e+00 5.646465e+00 -2.445959e+00 -6.507548e-01 1.461988e+00
## [1386] -4.708838e+00 1.540864e-01 1.477291e+00 1.373944e+00 -4.660275e+00
## [1391] 7.335583e-01 -1.903807e+00 -2.589027e+00 -6.835391e-01 2.353382e+00
## [1396] -2.266662e-01 1.708780e+00 2.543311e+00 -2.668355e+00 2.870183e+00
## [1401] 2.451421e+00 1.061851e+00 -1.390443e+00 1.145852e+00 -4.039708e+00
## [1406] 6.874064e-01 -2.769586e+00 8.098092e-01 2.914680e+00 5.462117e+00
## [1411] -9.523452e-01 -7.007635e-01 1.673286e+00 1.742131e+00 -5.761359e+00
## [1416] 4.112777e-01 1.369239e+00 2.544311e+00 -3.207791e+00 5.133821e+00
## [1421] -1.162488e+00 6.652906e+00 6.628175e-01 -2.589228e+00 -1.338664e+00
## [1426] 2.249608e-01 -2.261930e+00 -3.434984e+00 2.812966e+00 -2.987736e+00
## [1431] 1.691066e-01 -1.033769e+01 -3.558723e-01 4.798902e-02 3.949342e+00
## [1436] 1.430321e+00 7.424776e+00 1.735959e+00 -3.182292e+00 -3.371646e+00
## [1441] -2.446394e+00 -1.325501e+00 -4.899829e+00 6.009415e+00 2.645920e+00
## [1446] 7.930700e-01 -3.501719e+00 6.476575e-01 -9.172704e-02 2.846996e+01
## [1451] 2.754259e+01 2.141564e+01 3.250275e+01 1.613269e+01 -6.582779e+00
## [1456] -5.101848e+00 9.406317e+00 -7.545069e+00 -4.416025e+00 2.489963e+00
## [1461] 1.318949e-01 -7.042232e+00 -3.920012e+00 8.116825e+00 -2.772948e+00
## [1466] -1.869869e+00 3.401294e+00 5.359566e+00 -8.947968e+00 -9.632007e-01
## [1471] -8.980053e-01 2.261180e+00 1.110975e+00 9.267411e-01 1.330717e+00
## [1476] -5.901642e+00 -4.843290e+00 -3.027352e-01 6.217036e+00 -6.841956e+00
## [1481] 1.576570e+01 2.883289e+00 -2.109725e-01 -4.856933e+00 1.326494e+01
## [1486] -1.266719e+01 -2.198993e+00 4.786263e-01 -2.625936e+00 -4.496895e+00
## [1491] 1.100072e+01 4.536864e+00 -3.884524e+00
```

```
diff(binary_data$x, lag = 10)
```

```
## [1] -3.676407866 -3.870596383 -5.766236972 5.968817307 1.628609802
## [6] -2.999357738 -5.553758247 -8.414103257 1.090662064 0.485112778
## [11] 0.742961159 1.601433554 -0.543938754 -6.114934310 4.875543630
## [16] -0.826517569 2.722441248 6.946351816 -8.685657998 -3.741770847
## [21] 1.592940522 -0.705140676 -0.333680902 6.260444283 -7.083902813
## [26] 5.216753980 0.507631189 4.958803571 2.994517932 -1.408043932
## [31] -1.638862807 0.376878806 3.657224482 -7.524527578 -1.248019457
## [36] -6.099350807 4.572180399 -1.031018131 3.252134525 4.323058273
## [41] 3.375482013 -4.832487407 0.184534648 2.013379593 4.167384645
## [46] -19.043780993 -24.115990823 -30.995450710 -21.235840393 -19.820717483
## [51] -22.136068409 -19.140593464 -22.309217566 -19.864006250 -21.391467106
## [56] 0.768903661 0.042271541 0.164844339 -2.335680287 0.783276789
## [61] -0.881447659 1.336641797 0.971035909 0.015562094 -1.347203246
## [66] -3.122221473 -0.365290430 -1.307507412 0.462876355 -0.914133599
## [71] 0.476994569 -4.682111431 -0.963155954 0.424675633 0.378468099
## [76] 1.876939131 -0.595486752 -1.799951357 0.929912831 -1.069977014
## [81] -0.965969892 2.272447394 -1.580503431 2.095285969 1.419430969
## [86] 0.826601939 1.482454655 3.422155843 -7.118599157 0.708616075
## [91] -2.120795315 -3.750473621 -6.533517934 -7.623838941 -2.995779524
## [96] -8.094786311 -7.668258565 -8.013739444 -0.237745212 -3.437809602
## [101] 2.142977606 -0.301766767 4.307348741 -2.633628819 -3.754333103
## [106] 0.490056250 -3.138531410 1.647391575 2.323901657 4.602095203
## [111] -3.088877449 2.211679830 0.662478421 3.917994848 1.476565409
## [116] -0.328044657 6.416183216 -0.147365097 -3.095930580 -7.070140661
## [121] -0.098563064 -4.314714646 2.619774093 5.659878280 -0.496078660
## [126] 3.651160184 -2.128368190 0.589558910 4.741286153 2.108504195
## [131] -4.821071400 3.135685239 -6.856955878 -7.759762433 -2.404323697
## [136] -0.710359219 -1.319276170 3.295036001 -4.205942250 -0.171112592
```


##	[141]	5.894271647	-0.548158941	-0.336725231	0.515952336	1.420105222
##	[146]	-6.021076942	-0.022886733	-5.117664348	2.702839743	2.103252328
##	[151]	50.970899367	47.978179861	56.956675018	52.795818576	54.340962091
##	[156]	55.476400375	53.581181344	52.276959865	53.219348651	51.176458715
##	[161]	-8.139277908	3.345706433	-4.112078102	2.545414259	-1.855284172
##	[166]	-0.845198370	0.087774401	3.874568788	-3.016041954	-4.291341492
##	[171]	6.360453772	-2.634097275	-0.422159261	-6.212683112	-3.313266095
##	[176]	-2.606862813	-5.004430253	-4.999965877	-1.466318604	1.553628235
##	[181]	-1.933823404	0.090164388	2.893997833	4.892753339	2.955366431
##	[186]	6.232635425	-76.322788458	-75.707612633	-80.958742686	-80.125253274
##	[191]	-82.804537877	-76.173382267	-85.498846939	-81.013973910	-82.603061441
##	[196]	-83.603141817	-2.720677356	-5.461046070	-4.196488734	-1.364747262
##	[201]	8.590594116	-6.300711191	4.853016870	-2.543546287	0.372983454
##	[206]	-0.468199473	4.718764681	6.778006551	-2.095214472	3.533366572
##	[211]	-1.481895888	6.172903183	44.513756040	47.124889081	44.324245649
##	[216]	46.121112302	41.292058080	41.147936552	54.558033380	40.753436672
##	[221]	39.231686402	41.845726699	-1.796599688	-3.248662690	0.254546526
##	[226]	0.902037981	4.631318509	-4.263750380	-5.445713388	4.247326199
##	[231]	6.294151620	4.353895304	1.658698903	0.100379233	0.843996509
##	[236]	-2.896649011	-3.570366613	4.837880796	4.972803514	-5.835664329
##	[241]	-2.987756118	-0.107105053	0.258027539	3.771444471	0.003807151
##	[246]	3.475823087	1.052430430	-2.685344990	0.261151157	-9.161893562
##	[251]	-14.583491309	-13.495471082	-18.241143258	-15.888664790	-11.672465828
##	[256]	-15.037237427	-15.966501205	-17.063953200	-13.972712133	-0.325932016
##	[261]	5.169116107	-4.844980246	2.495312694	0.032285232	-3.888780693
##	[266]	0.197045395	1.380652057	9.028853717	-0.521173755	-5.497028970
##	[271]	-5.506575274	-0.968351915	1.954417811	-3.459237773	4.205569773
##	[276]	0.663730821	-0.586343442	-8.319282061	-3.571781121	3.436272950
##	[281]	-3.936101468	-1.692892949	-0.394051892	6.190841532	-4.408806635
##	[286]	-9.100437019	-3.171052975	-1.743420963	4.580801988	-1.267441039
##	[291]	0.318542846	12.056113888	6.134491320	2.016146423	0.542279540
##	[296]	7.697120392	3.869161777	3.683723116	0.476218520	0.567577789
##	[301]	-1.444037265	-8.339811677	-7.347833708	-45.241815540	-30.046109651
##	[306]	-36.036138253	-36.868441164	-29.184307075	-38.693129050	-35.585921705
##	[311]	-30.169923828	-35.224061712	-35.699054885	7.005106784	-8.361819496
##	[316]	4.391172048	-2.614421746	-3.198919817	-0.248946591	-6.065803124
##	[321]	-0.572255729	5.978037266	-7.656067032	0.585310886	6.155353064
##	[326]	-7.400129566	1.489516891	-5.113871841	5.478301227	2.999299433
##	[331]	-8.273473972	-5.342194154	11.102385923	-5.432094094	-3.612722545
##	[336]	-0.113598466	4.721077086	0.495381652	-8.590097174	3.825451982
##	[341]	12.449473865	-4.670220390	-3.838773152	2.284985979	-0.374868625
##	[346]	6.620095129	-7.914096896	3.141072028	5.470487963	-2.436047501
##	[351]	-7.027585766	8.176082839	2.023271098	0.907945483	1.856803809
##	[356]	0.551424391	5.881685803	-2.496115504	-5.980395385	81.936908478
##	[361]	82.199392807	73.925357705	78.338424834	79.698817191	77.809777533
##	[366]	75.016099458	78.705367057	84.742462743	85.329868204	1.858306433
##	[371]	-1.673172003	-0.880402283	0.487757884	-3.062810066	1.088503507
##	[376]	0.439115271	1.370286772	-3.909648204	-3.432483719	0.194552103
##	[381]	0.337831044	0.731202116	-1.129326388	3.323283735	0.859830806
##	[386]	-1.241049608	-1.709076477	3.270502248	3.117847187	-1.331668398
##	[391]	-3.162390937	1.023256466	-3.028138621	4.354776962	-1.171478177
##	[396]	2.863766217	0.236580053	-0.290741841	-2.920492061	-0.288907113
##	[401]	6.563820617	0.046519166	2.895324548	-7.333581901	3.683428511
##	[406]	-3.328118848	-7.454756456	-3.921597301	4.440433854	1.136618837

##	[411]	-4.698720839	-1.534626351	1.225850196	-0.060151647	-3.355505270
##	[416]	3.362835511	11.083318814	-58.503108688	-67.702892203	-67.743747615
##	[421]	-69.898491411	-64.587751905	-60.611447091	-57.925845196	-64.080809701
##	[426]	-68.097533717	-67.452969557	-4.173309935	-7.786065745	3.158632670
##	[431]	9.534225726	3.947997011	-4.210873240	5.914688267	-2.193245864
##	[436]	-0.239212620	-2.094379674	6.213445751	10.725984188	3.450912183
##	[441]	0.180129227	-5.525274077	-2.098274846	-2.650398525	0.411090970
##	[446]	13.119724552	-0.071245283	-4.747129464	-2.608890099	-6.361019291
##	[451]	-0.447057530	2.627376715	1.571939981	-3.693186452	-0.308813705
##	[456]	-17.409979636	2.648616251	3.561428977	-3.544396814	7.496370951
##	[461]	-2.977825102	-2.321655535	5.930957122	1.280184181	6.038976011
##	[466]	9.635010585	0.873843285	-6.002699787	-15.044766435	-26.704194258
##	[471]	-18.965366785	-14.013142440	-26.122129624	-24.897205866	-33.419974444
##	[476]	-16.798418603	-23.607920119	-20.487572744	-1.087195076	0.392941804
##	[481]	4.759078003	1.716938646	-0.829789330	-2.156120874	8.537232807
##	[486]	-8.066018287	1.268651022	-1.302870691	-6.077943909	-7.230136348
##	[491]	-5.099398408	-8.098553487	2.800063701	0.420939233	0.294810573
##	[496]	4.264760403	-6.595660846	5.476025970	5.884302450	5.441594624
##	[501]	-4.022548688	5.389722800	-7.069285996	-6.966610044	2.901381345
##	[506]	0.826249611	6.034809525	-2.558279183	-6.442092369	-4.705374310
##	[511]	1.621410061	-4.682131972	3.976984546	5.490098305	-10.893297776
##	[516]	-6.390809681	-2.270864390	5.032287163	2.862345610	10.239229950
##	[521]	4.627349162	93.477527827	94.530226277	92.751203961	102.871017961
##	[526]	93.150073278	93.375186618	88.275168445	94.297865003	88.898717017
##	[531]	89.823749310	1.327698792	-2.362383781	3.494844425	-2.505776770
##	[536]	3.348465416	2.631215324	-1.544257623	1.089887873	-1.283923148
##	[541]	1.911247347	-1.147293843	1.900071667	-2.291426144	-1.514585701
##	[546]	-1.349338099	-1.741743604	-2.216322850	1.478361756	0.935070576
##	[551]	-0.724944853	0.893702055	0.341400890	2.326585883	2.620434390
##	[556]	-0.006027195	-0.730466933	0.459527628	-1.576152001	-0.922012894
##	[561]	-0.157855216	1.214974612	-3.078413303	-1.213753859	-3.362440843
##	[566]	-63.306038872	-57.461940334	-58.007430800	-69.915762221	-58.608296035
##	[571]	-64.789934607	-68.878214833	-62.500893426	-60.184894169	-67.831870181
##	[576]	-1.474850334	-3.544119472	-9.564832564	15.321826882	-3.272279232
##	[581]	-0.023375927	8.388704110	5.649715281	0.395199495	4.936011132
##	[586]	-1.661530643	-0.318365490	3.846365973	-9.021418573	-6.733067909
##	[591]	0.077527381	-4.044694627	-0.367953310	-1.373205750	0.914000066
##	[596]	-3.633959618	0.060221467	-0.115649416	-0.248854696	3.026367489
##	[601]	4.466285359	-2.436549189	-5.730230729	-7.335100620	-2.003271694
##	[606]	11.816563205	6.360173274	-3.424202050	2.094654995	5.224618232
##	[611]	1.479769157	1.147476044	2.665499773	-11.996270141	-16.555710036
##	[616]	-23.258859624	-21.336472388	-9.200474888	-18.186373409	-24.462961942
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##	[626]	3.525492773	-3.955501632	-7.505100136	-3.076121995	2.400072201
##	[631]	-2.564509315	-8.504193734	5.099347125	5.532597617	-3.545071275
##	[636]	-3.486586010	1.128042246	2.960504963	0.890861534	2.946245811
##	[641]	3.755558120	5.373175582	-0.640287455	-2.144254450	3.669498435
##	[646]	0.778575924	-1.550835244	-0.051120180	-2.173574313	-0.801875325
##	[651]	-1.058416798	-1.100594235	1.336279307	3.607970762	-2.498288705
##	[656]	-1.596738797	-6.647024014	-0.703844802	7.420025180	-5.575032895
##	[661]	0.793838280	-0.310035100	-1.669667864	-5.708055056	-1.173841307
##	[666]	1.791988248	9.877207546	-10.015778312	-21.534110722	-4.296581593
##	[671]	-12.783490962	-9.277857767	-4.587839637	-5.847650036	-5.955775361
##	[676]	-7.887058478	-14.930279102	0.198081249	7.362576125	-4.344763978

##	[681]	-0.801869911	6.679647673	-5.303373613	3.526314188	-5.675989121
##	[686]	-4.215162435	-2.068098660	-1.532157976	-0.061582345	-1.703886460
##	[691]	5.830515955	-7.901795869	4.326119103	-3.900436328	4.122687253
##	[696]	-1.438201653	1.652244731	-0.312017030	-5.101157022	1.788466139
##	[701]	-0.875495385	-1.222985505	-1.816714106	96.519209472	99.115001143
##	[706]	97.710452188	95.828566346	99.988431662	97.780955659	98.018605704
##	[711]	93.189924267	97.612999487	99.159309863	-4.325289572	-7.953173570
##	[716]	-0.745333328	-0.065889393	-1.358321530	3.596256314	-0.382039236
##	[721]	2.706111895	2.554701577	-4.371614682	2.839110202	2.695500642
##	[726]	-0.314813696	-2.266032422	0.238394373	-3.095095098	1.139063758
##	[731]	-3.469325049	-0.904108113	-0.950308089	-3.452096575	-0.512905451
##	[736]	4.953745756	2.908419494	-0.713611920	-0.469646061	0.268504284
##	[741]	-0.598808722	-2.378251816	3.992810944	-0.275816306	0.923653043
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##	[751]	0.100627531	3.779193529	-6.983009381	1.404748360	0.314828362
##	[756]	1.218351587	5.374307243	-79.799490675	-78.444710701	-78.387521989
##	[761]	-81.546108663	-78.593789688	-83.138105469	-79.152082112	-86.014712517
##	[766]	-78.316730091	-88.649813123	1.610344598	7.891591080	0.835322256
##	[771]	7.854900416	-7.693445495	10.981329229	-3.949166554	7.299723044
##	[776]	-1.627462348	-1.704831384	-2.607090818	-3.891857194	-4.540781930
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##	[791]	-2.919038766	-1.329081664	0.618013611	-9.109920020	-2.124886068
##	[796]	7.247201275	0.797498520	-5.917555611	-0.767982758	2.220492590
##	[801]	-0.679675286	-0.889904321	1.442048766	4.657119826	-6.197023332
##	[806]	-8.682761417	0.071270633	8.341308671	30.551862309	31.696356102
##	[811]	28.465512566	33.393104622	27.511465306	28.947646231	27.502752420
##	[816]	31.179182828	26.092210071	19.771558040	10.215202250	3.477831581
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##	[831]	1.650597835	0.625208417	1.326257409	-10.517709089	6.002160198
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##	[851]	-2.559899788	5.918861064	-6.309912089	4.486604762	0.925036507
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##	[861]	3.585737645	-15.463641760	1.228700853	-15.258907579	-0.985293264
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##	[871]	-20.667079739	-12.524377697	-10.868420503	-9.241269521	-20.837496333
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##	[881]	-2.711845721	3.390597658	-0.897930784	-1.938829694	4.739477079
##	[886]	0.511506584	-3.892695066	5.623383838	4.337430316	3.615334761
##	[891]	-3.068631359	-0.343839723	-0.955744433	3.203500736	-5.600188574
##	[896]	-2.449513741	4.146129199	-5.643914275	-1.247545751	-1.052328240
##	[901]	3.618152560	-6.340629566	1.505797520	-8.546264895	0.185853048
##	[906]	7.114189722	-4.710806042	1.972016034	0.445561874	2.362838716
##	[911]	-5.764127813	5.381296470	-4.671160930	7.898744268	-3.474831089
##	[916]	-6.506931837	7.266187506	0.174707552	-7.103121502	-5.376325270
##	[921]	0.887330090	3.167521804	1.139573610	0.663989460	72.288478130
##	[926]	64.849659353	62.528862478	66.221976738	71.025081831	65.189943573
##	[931]	63.643413122	66.891851172	68.260778131	60.864124924	-3.877012603
##	[936]	-2.407259121	-0.020187418	-2.584599108	0.739329530	2.555588739
##	[941]	3.147588174	-5.774165283	-5.978502614	7.158405501	2.652340478
##	[946]	6.449113343	0.830504043	1.801316636	2.811159766	0.296871239

##	[951]	1.481158701	-4.314995394	4.559402467	-3.288677608	-0.653508679
##	[956]	1.365636537	0.114912064	-3.724168596	-9.197610312	1.315416457
##	[961]	-1.543692343	8.706954159	-4.565743615	-0.005525201	-0.302247774
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##	[971]	4.167952823	-3.646685696	4.914668053	-8.456726902	-0.794671647
##	[976]	3.074669325	-65.173729830	-64.557310844	-67.551781157	-61.446931326
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##	[991]	1.231206513	-0.450645327	3.642548471	3.446486450	-9.680625405
##	[996]	-2.992421600	-12.403654790	14.104071864	2.588880106	5.478517514
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##	[1006]	-2.006177911	17.880579724	-11.402344259	-8.545186310	-5.690756382
##	[1011]	7.962287003	1.897800750	1.363911712	9.955062950	-9.486317030
##	[1016]	4.554464692	-21.342828971	-0.837470724	3.199129191	4.211186010
##	[1021]	-3.083264520	-4.977785923	9.840728192	-6.547574511	13.867212331
##	[1026]	7.456243007	11.239385916	-0.403386458	3.494567602	39.832125612
##	[1031]	39.396727791	38.314227145	33.044423820	33.392197690	29.471527683
##	[1036]	27.593666728	37.200324242	42.019592915	38.095611127	0.963564261
##	[1041]	-0.022421104	-0.038177899	-0.985677126	-1.182507201	2.326118877
##	[1046]	1.093181237	-1.377632049	-0.960946024	-0.963275733	-1.243403732
##	[1051]	0.933982079	-1.020832855	-0.255417869	2.463490123	-1.844129092
##	[1056]	0.315412372	-0.209256211	-0.666820838	0.300833040	1.448134468
##	[1061]	0.770064477	1.294314525	0.400040880	-0.041187431	1.533229348
##	[1066]	-1.336042090	1.723853763	0.149970899	-0.076529824	-0.730144817
##	[1071]	-0.488935783	0.112098177	0.726514769	-2.189472021	-2.534695378
##	[1076]	0.646314035	-0.186874920	-1.909905866	-2.087220914	-2.470235013
##	[1081]	-0.734078350	-1.465645033	0.184969762	2.146547413	1.335069758
##	[1086]	5.546829297	7.787964974	13.378199415	9.557657130	13.442185998
##	[1091]	8.991416950	11.464095705	6.820366335	5.079365162	9.688802997
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##	[1101]	2.155147379	-1.636936764	2.097614349	6.504020050	-0.497861003
##	[1106]	1.368249980	-0.440583584	-1.082476928	1.666597661	-0.806275273
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##	[1116]	3.740112378	2.063139865	-2.201002479	-3.060394115	0.898697727
##	[1121]	-0.556405217	-0.791421475	2.886695218	2.813456173	0.250673449
##	[1126]	-1.758069419	-36.857021513	-22.652851498	-13.183438622	-24.571895069
##	[1131]	-31.692555631	-27.140413742	-28.811481431	-29.041715334	-30.599974691
##	[1136]	-26.844919412	10.486566871	2.776674526	-7.942383897	2.697251835
##	[1141]	8.505726089	2.890130676	-1.313126058	1.445742951	4.668396246
##	[1146]	-0.667928807	-11.431956821	-9.892487342	-3.626042426	-4.248162294
##	[1151]	-4.226971330	4.250619417	1.391472776	1.734020024	24.080058717
##	[1156]	24.875883861	37.405567972	28.408122114	23.370975261	15.913003818
##	[1161]	25.111488797	11.886158400	22.556926108	22.102064946	3.565162034
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##	[1171]	-8.015409469	6.072998957	2.553562471	2.068726718	1.201782682
##	[1176]	18.877608213	1.823132698	8.726646502	1.609636902	-4.610709187
##	[1181]	5.528716804	1.711727542	-1.684997194	-3.214778307	-6.722528287
##	[1186]	-5.249555302	-2.119367066	-12.532285471	-3.668441658	-0.507052590
##	[1191]	-3.267134563	-1.501968228	-3.498764638	-7.418433865	-0.721182453
##	[1196]	1.853304420	-0.818526021	3.244269610	7.650805075	5.936813125
##	[1201]	1.219132489	2.766676137	3.673315103	11.894827240	-2.595098760
##	[1206]	-1.664320538	8.719394273	8.796400296	0.934990038	1.229893926
##	[1211]	1.660300281	-2.445611530	-12.553632681	-20.892128558	-11.417935730
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##	[1221]	-16.789195737	-14.387024413	-2.182817154	2.006764428	4.383408339
##	[1226]	0.666764035	2.291914508	3.095661571	-2.691117567	2.517090659
##	[1231]	4.993216690	2.421745752	-0.093215888	1.845200021	-5.331085127
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##	[1241]	1.906758425	-4.014478157	-1.524144789	1.421140068	4.695920386
##	[1246]	0.802648618	1.363743081	-3.586220617	1.104739699	-2.280884774
##	[1251]	1.431422525	0.436144406	-0.614157694	-1.319376048	-4.197608880
##	[1256]	-0.130037247	-2.224071275	1.924604091	-2.962921169	-1.908606514
##	[1261]	-19.648944228	-18.450049743	-16.134950089	-18.532218987	-16.765994425
##	[1266]	-20.601306624	-25.325767814	-16.549465794	-16.220661250	-18.856119850
##	[1271]	-6.097294329	-4.118053909	0.252754014	0.530424119	-2.502757117
##	[1276]	-0.672772507	5.994427714	-3.589031951	-1.771078473	4.630534766
##	[1281]	3.262532056	4.723160368	-2.946504774	-5.415389875	7.477634968
##	[1286]	-4.670909772	-0.821745888	-1.488547758	0.194641093	-6.088813833
##	[1291]	-1.763755977	-0.257665727	4.712120563	1.438549359	-8.868282177
##	[1296]	5.924289978	0.958082819	0.957071320	-1.682857176	1.585606802
##	[1301]	0.432828695	-0.650939894	-0.578426336	1.581322363	5.975904875
##	[1306]	2.155122022	3.085033365	1.334198980	3.450398841	-1.257945376
##	[1311]	0.329882987	0.952217036	0.980927008	0.983051243	-1.993778715
##	[1316]	-4.318106914	-1.635707909	5.078817111	-2.467297740	2.609162846
##	[1321]	-0.008935264	0.097189175	-2.453518922	-3.267895782	-3.410651065
##	[1326]	1.253807758	-3.042645834	-2.826254271	-1.844569327	1.747755636
##	[1331]	-0.069140504	-1.597675276	-2.954485655	-21.157070496	-19.725891444
##	[1336]	-23.401098520	-19.048524227	-29.214907260	-22.538315651	-24.771030472
##	[1341]	-27.983901466	-25.652984045	-21.960596652	0.672286306	-1.116979697
##	[1346]	-0.254264292	-2.915939420	4.848375492	-2.698956524	1.040660081
##	[1351]	1.762058638	1.262688419	0.455979767	-0.663473447	-0.515057259
##	[1356]	-0.790543182	-0.021972377	-5.878123739	6.218888845	-2.789751043
##	[1361]	1.616654407	0.430355600	0.838578070	-0.057303453	-0.492097811
##	[1366]	1.658645612	2.767282396	3.537545246	-3.642736134	1.689177307
##	[1371]	-1.630661998	-4.967436678	-0.055297794	0.686053863	-1.238724175
##	[1376]	0.801406236	-1.791642673	-1.816442358	1.204188920	0.194672300
##	[1381]	-1.027555094	5.800551673	-0.968668209	0.723188916	-3.198287215
##	[1386]	-3.975279227	-1.749720130	-1.111735755	0.690404674	-2.306893214
##	[1391]	0.506892133	-0.195026690	-0.045715552	-3.351893654	5.223565150
##	[1396]	2.224754713	2.770630715	1.152868323	-1.522502577	-1.169524485
##	[1401]	3.138827319	-1.707735445	-0.580633780	4.060532195	1.422408979
##	[1406]	-0.264938797	-3.470349847	2.483094832	4.656811062	-0.299242126
##	[1411]	-0.541067469	0.668475644	4.217596515	-1.465660339	-0.627537641
##	[1416]	-0.751210346	8.022145018	3.207128365	-5.797018960	3.795156670
##	[1421]	-0.937527302	4.390975436	-2.772166629	0.223738367	-4.326400822
##	[1426]	0.394067412	-12.599621964	-3.790856391	2.860955119	0.961605837
##	[1431]	1.599427585	-2.912915228	1.380086580	-3.134303398	0.577696328
##	[1436]	-1.016072819	6.099275466	-3.163870449	2.827122862	-0.725725982
##	[1441]	-1.653323746	-4.827219701	-4.252171865	5.917688245	31.115877212
##	[1446]	28.335663778	17.913916408	33.150411407	16.040965704	21.887178546
##	[1451]	22.440745508	30.821952124	24.957684964	11.716667274	-4.092815866
##	[1456]	-4.969953327	2.364084608	-11.465080487	3.700799084	-0.282984612
##	[1461]	-1.737973637	-3.640937922	1.439554488	-0.831143235	-3.736148275
##	[1466]	-2.767873858	5.662474096	6.470541140	-8.021226724	0.367516456
##	[1471]	-6.799647347	-2.582109772	0.808239909	7.143777340	-5.511238724
##	[1476]	9.864057725	-1.960000384	-0.513707752	1.360103702	6.422982098
##	[1481]	3.098511564	0.684296258	0.267653768	-7.482868505	8.768043485
##	[1486]	-1.666472950	2.337871282	-3.405897790		

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diff(binary_data$x, lag = 15)
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##      [1] -1.647888312 -9.600386282 -4.622891591  7.439427974  0.447718827
##      [6] -4.284916132  1.777465206 -10.101387392 -6.494882913  6.541547383
##     [11]  1.202001985 -3.007348651  8.089697197 -7.215047331 -4.922661822
##     [16]  0.307382127  6.626082777 -2.020965037 -1.325100693 -1.027468208
##     [21]  5.675794806 -4.101151016 13.592439522  1.894404911 -11.206249384
##     [26] -0.504963111  4.280520335 -5.310092371 -0.163970273  1.466283183
##     [31] -2.016496523  1.176170059 12.895102292 -1.113904848  0.200711702
##     [36] -2.346235078 -1.059598262 -10.084361294 -1.145108612  7.041711760
##     [41] -19.421414710 -23.316699569 -21.757572900 -14.825217664 -18.371986324
##     [46] -18.382952680 -24.772372124 -31.362560728 -24.261249387 -18.672813619
##     [51] -22.027993062 -18.441940621 -21.777263209 -19.174277544 -21.756094181
##     [56] -0.220619346  0.680260496  0.603925891 -3.009846900 -0.199299383
##     [61] -3.014146126  0.333362413 -0.775553055  1.152605061 -1.278760674
##     [66] -0.512528437 -4.044122477 -0.524074402 -0.249490979 -0.604108073
##     [71] -0.255759336 -1.598766137 -3.546540320  2.066955798 -1.001534441
##     [76]  1.643723144 -1.406384652 -0.797070421  1.382918635  1.729456495
##     [81]  0.093848034  4.565799949  0.838771477 -5.476318992 -0.671386465
##     [86] -2.354011301 -4.561371521 -5.530636999 -7.170833137 -0.196346015
##     [91] -7.034968386 -5.374906010 -5.594464537 -7.809350173 -5.528627036
##     [96] -1.037635635 -6.345592943 -4.645444100 -2.685862799 -4.659295192
##    [101] -4.424116820 -4.762963799  2.586444973  2.138390426  2.069247691
##    [106]  3.968273227  3.534345452  4.030773765  1.469877261  0.255079818
##    [111] -6.895139083  1.954986184 -1.868268866  1.676088665 -1.246559867
##    [116]  3.379653913  2.358162216  5.003156283  4.805853884 -4.843094045
##    [121] -0.155101450 -2.385061836 -1.941188376  2.499379969 -0.614621081
##    [126] -1.113372830 -0.922335761 -1.706434498  0.142022030 -0.177277081
##    [131] -0.766897604  0.610376640 -1.265926469 -7.366440562 -0.289655013
##    [136]  1.129738633  0.657873488 -2.632718639 -4.083311786 -0.865676054
##    [141] -1.966903147 -2.548195332  0.473365061  3.096161615  4.217921012
##    [146] 52.810997218 49.955329519 51.028920378 52.918449040 53.646398628
##    [151] 47.615225582 51.581144952 53.087050157 55.799557930 53.974274505
##    [156] 50.692796253 53.323922685 52.034506624 52.761023556 49.687862128
##    [161] -4.200872155  3.690739492  0.004943927 -0.012302600 -4.658029077
##    [166]  1.576849650 -2.891355933 -0.664612502 -6.671008208 -4.801862681
##    [171]  1.331542939 -4.659397194 -0.882943848 -4.024035462 -1.249116671
##    [176]  0.488224616 -2.888965946 -1.645183457  1.237787085  2.444845242
##    [181]  1.203724592 -78.348088377 -76.168397220 -78.770095036 -78.061103850
##    [186] -79.709450448 -74.057917960 -82.144064518 -78.309868222 -81.711844434
##    [191] -80.465593822 -81.158930121 -84.523441123 -87.859337109 -82.381217543
##    [196] -77.351491757 -4.035840693 -1.583435016  0.105328177 -1.213607705
##    [201]  1.870744583 -0.266783173  7.753412367 -8.940577671  3.755210470
##    [206]  4.769754173  4.857739846 48.391367095 51.426705992 44.475385205
##    [211] 39.401262768 47.325986098 44.048332049 48.161001997 44.135663687
##    [216] 44.469640048 41.984701864 39.816760856 50.273257775 41.196565159
##    [221] 41.785196637 45.784401424 -4.729174372 -4.409600472  4.058744238
##    [226]  4.642679366  5.046539088  0.327523207 -4.184396373  1.287124996
##    [231] -0.343138776  0.368308112  1.905306112  3.811865732 -2.031466617
##    [236]  0.752885267  0.308115526  4.849301127  5.032761486 -2.956394053
##    [241] -3.161467309 -2.933156761 -2.438737781  3.972637656 -12.037356688
##    [246] -10.933957031 -9.616988944 -18.229722927 -15.828706818 -8.793195552
##    [251] -15.210948617 -18.792552914 -19.760718520 -13.771518948 -12.367095855
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##	[256]	-9.240664011	-15.514399619	-13.049065244	-16.057572743	-3.520082682
##	[261]	-0.430411914	-3.916429775	7.509278455	1.595972087	-6.191658996
##	[266]	0.289998142	-0.516250329	5.969305767	-5.544098382	1.011419107
##	[271]	-4.935797199	0.342207029	-3.305316301	-2.008094267	1.133394647
##	[276]	-3.843148721	-3.589795335	-3.453599843	1.167916905	2.099641441
##	[281]	-8.529658945	-1.860494031	-7.003155075	6.031945494	-4.339616166
##	[286]	-4.188336696	9.052661995	11.000173539	6.755844449	-0.794351969
##	[291]	3.103562915	3.701560696	-2.925380067	0.317322482	0.636768259
##	[296]	3.468063058	3.883903293	5.395760794	-43.066773079	-29.573020581
##	[301]	-33.251118184	-45.222994356	-38.244178462	-40.391952991	-35.491432987
##	[306]	-34.398981163	-35.209320196	-33.987017207	-36.537884816	-38.502417866
##	[311]	-27.415908870	-39.497604426	-34.095264571	4.600915958	-11.511126459
##	[316]	1.064901360	7.637158234	-12.458777164	2.740555121	3.238856903
##	[321]	-4.646114608	-2.784025823	-3.510081527	3.074110401	-0.150007530
##	[326]	-11.599744659	4.909385826	1.842528577	-2.442592382	5.691937482
##	[331]	-4.187457345	-4.040986003	4.641367158	-6.101297659	-2.479908613
##	[336]	8.249858772	-1.250351455	3.117627266	-5.635907630	2.317769425
##	[341]	10.706111756	-6.612888745	-3.319946737	4.801284398	-1.303233568
##	[346]	1.335871471	2.204654297	4.645516712	3.862135027	0.349121252
##	[351]	-1.191937718	3.939017449	-1.977289089	-3.464096966	81.008543534
##	[356]	76.915169149	84.044108899	79.842869518	78.090464255	80.594946286
##	[361]	80.851747506	74.468301666	80.741902556	80.957825755	81.010046159
##	[366]	74.690572756	77.282020812	82.826742906	81.008049574	-0.253458686
##	[371]	-0.908530030	1.913230733	-1.506170483	-2.173475155	3.394820728
##	[376]	0.012304342	-0.692144129	-3.045046225	-0.998534895	-1.251934313
##	[381]	-0.476407635	1.084556539	1.276573880	4.007182098	0.974648823
##	[386]	-3.589201866	-1.039174434	-2.163536642	6.788725786	-2.617964592
##	[391]	2.049527538	0.589934477	2.115158428	-2.236593698	-0.174089096
##	[396]	4.215668359	0.716421208	-2.538714341	-3.662703302	2.397132317
##	[401]	1.883799627	-7.888078446	1.221699748	-2.150936805	2.134007918
##	[406]	-3.346818697	-1.054785196	-1.022122304	-0.802362888	-0.669465840
##	[411]	-1.317185479	3.148721203	-60.176733488	-62.520247107	-69.293168208
##	[416]	-69.917191259	-58.187780645	-57.711972094	-63.168641939	-65.886894378
##	[421]	-64.715998357	-62.769622003	-65.575893619	-70.246161205	-62.779030267
##	[426]	-63.745801044	-65.323102449	-3.419736646	10.448938532	-0.336392627
##	[431]	4.943280434	-0.276249772	1.248999222	-1.594331822	4.752691616
##	[436]	4.531861900	-3.395406968	-1.344701558	15.584605752	-3.083934328
##	[441]	8.528779260	-4.295492065	0.712742998	-10.117910188	0.584918190
##	[446]	4.324016989	1.326349421	-5.986207328	1.165435111	-6.843660216
##	[451]	-9.061329603	3.878398262	6.372446822	-11.011908477	7.670198171
##	[456]	-11.773532665	-0.924060831	4.691879258	5.054509391	5.556335086
##	[461]	1.020738513	2.124864832	-1.202192946	-22.363488459	-18.725182382
##	[466]	-13.328919814	-17.585819523	-24.991679344	-16.298299661	-35.360010310
##	[471]	-12.799854988	-19.161399752	-27.620722812	-24.730867716	-24.371216588
##	[476]	-18.204852396	-16.742724162	-19.818768887	-3.409654099	-0.118583244
##	[481]	-1.900506490	-3.879606289	-2.801463878	-5.911605759	1.818621508
##	[486]	-6.505832201	-1.233357529	3.468867558	-1.901519790	-0.216714476
##	[491]	-2.394824091	-12.192205782	3.504351422	2.128817564	-1.277016675
##	[496]	-2.462362602	2.887714248	-2.297547748	-2.790185926	9.914803216
##	[501]	3.530823928	1.941157230	-1.853991461	-4.734214037	-6.277201558
##	[506]	-5.105712944	4.801243123	-3.796589171	-3.184390071	-6.420089184
##	[511]	1.162562935	-5.719429959	10.247581698	5.094741618	1.060647047
##	[516]	-1.304613394	92.243961425	93.291916288	96.008906259	101.156303088
##	[521]	92.691226153	92.337888631	94.545765596	93.902508316	100.852661840

##	[526]	94.909945598	95.842524607	85.897245344	96.641405073	88.411296368
##	[531]	91.412342407	1.491576128	-1.528718303	2.241192228	-3.302279269
##	[536]	3.671119666	1.320044146	-0.477851433	0.052113927	-2.002006350
##	[541]	0.239254997	-1.577866268	-1.382657372	0.224709559	0.138568077
##	[546]	-0.402290603	-0.417469123	1.407807080	1.288811937	1.902351188
##	[551]	-1.678019545	-1.161039358	-2.823201411	0.939983702	0.731140884
##	[556]	0.789192280	2.539249092	0.545716626	-1.403303679	-2.395160230
##	[561]	-64.259113564	-59.516681747	-61.172033101	-71.302364402	-60.497589541
##	[566]	-63.994715131	-65.608498808	-62.414704428	-60.012045846	-69.305017518
##	[571]	-65.576108682	-64.275775832	-67.658452362	-54.766783661	-60.407427931
##	[576]	-0.712052186	0.242145636	1.242441653	10.298915870	-5.760710351
##	[581]	-2.447704718	4.284073511	-1.311192963	-3.603308066	0.691374342
##	[586]	0.840325529	-0.258429519	10.439320908	-6.396116762	-1.574431053
##	[591]	-6.058288409	-4.044409132	-7.076557660	-4.247362257	-1.218269301
##	[596]	6.968141531	-2.376613218	0.862724205	-4.709798809	3.155365162
##	[601]	5.680747415	6.360458769	-10.132806400	-0.779501512	3.092348865
##	[606]	12.081870305	-1.289358640	3.643873395	-16.457214253	-16.426712363
##	[611]	-22.044397568	-12.539464429	-13.603050559	-11.630774301	-19.367341383
##	[616]	-23.624954004	-23.000430857	-20.804897993	-23.857929709	-20.481382815
##	[621]	-19.998673952	-17.642442105	-23.773650469	-2.710626156	-0.411559146
##	[626]	-2.930603695	-10.168152203	-6.505075980	-0.138958683	0.436507852
##	[631]	0.405001143	-1.163500917	7.059827931	3.486295838	1.364738885
##	[636]	-2.700538348	-0.839474989	0.359736702	0.792908863	1.705934086
##	[641]	3.748086382	5.789857573	1.909360626	-4.219876092	4.107934834
##	[646]	-0.272369136	-3.068111470	-1.264488954	3.510018091	-3.738600429
##	[651]	-1.604210535	-6.230342022	1.845803280	5.344403538	-5.136596496
##	[656]	-0.257106780	-1.827311327	-2.883036638	-0.024462652	-4.110566410
##	[661]	1.246194511	4.747459758	-9.506254339	-19.797677947	-6.934889385
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##	[681]	1.133626280	-2.663025137	-4.582823567	-0.940979075	-5.853923155
##	[686]	-0.320142670	-0.627221720	2.073411080	0.505274590	2.596734827
##	[691]	0.497294537	-7.690428079	0.408533017	-9.568450285	1.610532105
##	[696]	3.019524380	0.217891435	1.788854951	97.086066408	103.415622429
##	[701]	92.377230770	96.039934137	96.070845576	92.112941702	95.506450557
##	[706]	97.647650301	96.178646191	101.260181843	97.861933857	93.673982721
##	[711]	92.507392827	97.197030249	96.529238152	-0.810011456	-3.990589823
##	[716]	2.643310008	2.904781422	-3.099864500	2.920088399	-1.649122341
##	[721]	-0.997345136	-2.682001659	-2.391677338	0.420183018	5.101647505
##	[726]	-0.080681713	2.066562702	-2.691851060	-4.128264489	-1.779988556
##	[731]	1.250288725	-2.328283742	1.266325423	-2.888573245	2.674651146
##	[736]	-0.364676740	1.954343308	1.062565510	-1.308985697	-1.995399270
##	[741]	-1.781682958	-0.118786809	3.021539283	-0.209182280	1.419197983
##	[746]	-5.217794964	2.825117342	-5.206831950	0.565408724	-1.949075193
##	[751]	0.035477351	7.633772250	-80.770762336	-78.378076674	-77.891977049
##	[756]	-80.262606895	-77.074061166	-89.149843188	-77.813967779	-86.195429095
##	[761]	-78.381880272	-84.795234402	-72.177408357	-71.891233954	-77.371483155
##	[766]	-73.626058066	-90.141813904	1.630976716	-3.318423632	-0.508184062
##	[771]	1.536766043	-7.906276098	8.353606293	3.368990965	4.102447432
##	[776]	3.353105426	4.936657425	-5.202984420	-0.081528564	6.692578905
##	[781]	-7.572725106	3.576930813	0.469549645	3.058292731	-4.987683059
##	[786]	2.061529008	5.312407144	-1.977879990	-5.299591390	9.108474768
##	[791]	1.012042767	-2.054228873	-0.224389428	-8.838176175	-10.803275693

##	[796]	2.636444455	0.632741408	-3.633103805	3.617393223	4.701858884
##	[801]	-4.751679884	-0.653876576	7.498905632	30.823606154	23.017966476
##	[806]	23.854755746	33.228347510	29.795917111	33.333022212	29.984118713
##	[811]	27.107178231	26.328237816	25.828414905	36.381688579	32.692821389
##	[816]	28.025111027	26.182643110	16.597428410	-0.981376531	-13.682071423
##	[821]	0.136207896	3.877131190	6.132345730	-7.421874305	-4.672535829
##	[826]	-1.503473966	0.715641456	-1.847872221	-21.714287870	-11.157742806
##	[831]	7.053997713	2.327427750	2.320242662	0.893064529	17.557372387
##	[836]	4.329454856	-7.708563970	-3.612640374	4.619306306	7.053227285
##	[841]	12.196320788	11.357809170	6.286087158	14.354859756	2.265319479
##	[846]	-0.635828613	6.734434302	-1.253269366	4.553508667	-2.281810391
##	[851]	0.947820943	-7.443959655	1.271054353	4.238989507	-4.647809910
##	[856]	-3.843011878	-18.384797294	-5.316670417	-13.649485050	6.022789056
##	[861]	-5.446949367	-17.920366030	-11.352465004	-23.055364036	-26.316786486
##	[866]	-20.589062825	-14.625198737	-17.220686092	-24.252561845	-16.249943180
##	[871]	-24.986350811	-9.395708032	-16.457843588	-10.914099803	-20.356253811
##	[876]	-14.346238448	-6.677055769	0.814814570	-3.383642757	9.233473968
##	[881]	-3.807764488	-0.764025402	0.033960753	2.664600033	4.096577283
##	[886]	-1.461206008	-0.081911729	3.735747868	2.937501325	-1.341954017
##	[891]	-3.545432508	-0.008493860	-4.712022738	3.355883976	-1.695228035
##	[896]	1.645439968	-2.529846230	-0.381838450	-9.946193886	-4.771435731
##	[901]	6.637388572	-4.375460180	-1.784262271	0.597945114	6.267799254
##	[906]	-1.669174103	-1.294678958	0.590914895	-0.799903867	-7.193938580
##	[911]	-3.487695825	9.231356892	-3.115352239	2.041088507	0.705620937
##	[916]	-7.896033735	6.583648888	-0.241527529	-0.581476281	62.731700835
##	[921]	67.126091341	66.378922900	67.777785429	65.167426070	69.370395599
##	[926]	62.254311224	66.209312553	67.844543049	67.385770145	64.231013502
##	[931]	63.831502130	63.191213678	64.053612712	65.242766140	-0.362493791
##	[936]	0.552240045	-2.093715208	-4.355936303	3.519093815	1.693410407
##	[941]	6.637202351	-2.870133451	-2.405848783	7.189800983	3.811390050
##	[946]	4.440657867	-6.388523184	2.788065272	-0.508913324	-1.515687012
##	[951]	4.855250715	3.018943897	-0.151514765	-9.166214830	2.474466029
##	[956]	-3.552147819	1.487926932	-3.578994980	-3.325598291	-2.114806025
##	[961]	-3.284953847	4.791635000	0.944758605	4.802384136	-8.435310667
##	[966]	-0.749831534	-2.273670828	5.059841670	-2.584714881	-4.224894128
##	[971]	1.333407821	-69.089048988	-59.046808624	-62.743871821	-69.579994219
##	[976]	-61.472054651	-67.199403495	-70.429852829	-77.095035741	-53.064804188
##	[981]	-67.139601787	-60.400578139	-73.380806803	-58.276509774	-71.710668379
##	[986]	-63.315517463	-2.476318992	-2.229993514	-6.096768134	-1.298498267
##	[991]	-2.750754410	-5.336195972	10.557283723	8.142769835	-5.828955431
##	[996]	-8.661434032	-3.186959476	-1.602782588	0.642298414	7.868508812
##	[1001]	-5.988138833	12.995029079	-4.487609007	-3.848902925	-1.839086408
##	[1006]	2.293274572	11.114496065	-14.342942740	8.008481258	-7.096325732
##	[1011]	8.217299213	-12.678944562	3.467039470	-3.399475427	-3.869561670
##	[1016]	1.216187962	-11.743869582	6.900129710	10.006093056	12.461642981
##	[1021]	7.711255217	-3.337359396	1.699741300	-9.859970775	45.448880972
##	[1026]	36.058451060	47.913186534	40.782024253	40.199161555	37.721984654
##	[1031]	38.388186465	38.840750769	33.878606023	34.783214864	32.545232903
##	[1036]	28.579786950	36.635622719	40.199733585	35.522086752	0.215977919
##	[1041]	0.084639912	-0.851108425	-0.126763820	0.427741440	1.830301487
##	[1046]	1.920102300	-1.585534377	-2.075277199	-0.110034252	-2.591715434
##	[1051]	0.422473388	-1.022186737	0.192092468	1.911081681	0.952317079
##	[1056]	1.596985540	1.086412197	-0.714290295	0.812054050	0.184917645
##	[1061]	-1.847550781	1.722499881	0.597481235	-0.628938265	2.066301354

##	[1066]	0.792637384	1.407766585	0.679045312	-1.678251010	-3.797912201
##	[1071]	-1.971301222	0.241310436	-1.712465511	-2.674971748	-1.937163007
##	[1076]	1.394601124	-1.781732211	0.714044176	0.544826226	-1.732697626
##	[1081]	4.064463858	7.917177232	10.939219135	9.072157403	14.039718369
##	[1086]	9.739704038	9.869238413	9.444316378	7.711412302	10.426340384
##	[1091]	6.259804465	9.484682740	9.750431580	7.730365292	10.370191514
##	[1096]	6.348022121	0.444336675	-1.836268688	4.657775222	-3.513706617
##	[1101]	-1.363362505	-2.419996549	1.847588317	4.317597791	-0.124886756
##	[1106]	2.704507225	-0.490718084	-2.889759701	-2.606898127	-1.595358872
##	[1111]	0.221602495	1.280080081	-2.451028512	-5.246816374	1.271671974
##	[1116]	0.779852028	-0.841555975	1.079412445	-1.460039616	-0.538410150
##	[1121]	0.645785714	-34.743747147	-23.046571204	-11.970336949	-22.884113743
##	[1126]	-34.652815982	-30.045109582	-25.531066507	-27.441360834	-32.037082568
##	[1131]	-25.642728480	-23.465758802	-23.156591896	-22.726177019	-20.437535356
##	[1136]	-24.389020473	9.702042607	-4.191341067	-12.812179260	-2.796791253
##	[1141]	5.381898344	-7.757301881	-4.237597807	2.689495889	5.914277041
##	[1146]	-1.771072391	3.466095153	-5.576542817	-3.135775339	18.586015629
##	[1151]	21.752056116	26.758135415	25.483650365	24.614728198	17.158884612
##	[1156]	24.008345212	26.784210374	26.872870633	22.592332033	26.399339957
##	[1161]	11.031886175	13.002297844	21.078259680	17.130292750	-2.702319874
##	[1166]	-8.882948117	-4.548358642	1.018310990	1.290083490	11.688118820
##	[1171]	4.798005590	2.939272142	7.247980074	-3.362135295	-10.878191096
##	[1176]	11.592909958	6.668587055	2.347231706	3.825720608	0.746736303
##	[1181]	7.563859757	-5.253093881	-7.837867869	-9.099303671	-12.587026368
##	[1186]	-10.551832818	3.343486129	-9.878179434	-5.202350159	4.636263037
##	[1191]	3.888447373	-7.783347445	-2.908601065	1.766279711	0.072315045
##	[1196]	-4.083145028	8.229529333	6.327421140	10.360918739	2.548216868
##	[1201]	5.491261398	2.438015056	9.386563869	10.119703614	2.023391423
##	[1206]	-4.276149167	6.602443824	-9.470481151	-18.182014894	-14.806531988
##	[1211]	-14.687812604	-16.802551416	-16.088627000	-18.939920085	-10.891329608
##	[1216]	-19.401024366	-16.503974862	-20.449698601	-17.110240505	-11.653017575
##	[1221]	-15.681348850	-12.065025378	-0.439332748	-0.738909093	3.043696782
##	[1226]	4.552133837	2.391661225	1.258961277	1.899755975	-1.474282911
##	[1231]	4.457121970	-1.079869369	2.747483014	1.751080491	-2.091877590
##	[1236]	5.792128227	-3.914731440	-3.360845083	6.012013610	0.704546816
##	[1241]	0.266553898	-2.137872040	-0.745521716	1.010620169	0.958322762
##	[1246]	3.874275670	-0.076718630	-4.979001385	0.195883550	-2.740896031
##	[1251]	-1.770241774	-0.347465158	2.703227165	-3.373441069	-5.646204137
##	[1256]	-16.577317176	-19.890511454	-17.527730857	-19.441075135	-17.226005681
##	[1261]	-23.802970922	-26.109377378	-13.232080935	-18.274726271	-20.304715108
##	[1266]	-22.544574258	-21.784494088	-19.199580934	-15.947729847	-17.820156284
##	[1271]	-4.826799202	-1.664899920	-0.686162797	-1.513585758	1.091814084
##	[1276]	1.319264422	8.264434093	-5.596619914	-5.142458473	8.513598534
##	[1281]	-3.400414645	1.631408101	-2.427464569	-1.849368784	-2.494242633
##	[1286]	0.228280952	2.012340652	2.704532601	-1.932830640	-4.985218409
##	[1291]	-0.738656723	-2.133669448	1.476111524	1.883163915	-8.386270799
##	[1296]	5.332019418	2.183146646	3.614654022	-0.546149370	7.079500298
##	[1301]	3.180221277	1.209029644	-1.901810059	3.895013398	-0.775933998
##	[1306]	-0.262387572	2.177280863	3.638509711	2.119759050	3.500114781
##	[1311]	-1.570714332	0.224261629	3.755433388	-0.153606705	-4.142676027
##	[1316]	-2.426444859	-0.810563327	-0.149208191	-4.598535574	1.347409093
##	[1321]	-0.646789561	-3.770601240	-0.051747891	-2.981227276	-0.401141675
##	[1326]	1.822521551	-0.772530695	-8.182510956	-23.288308330	-20.987645198
##	[1331]	-24.038952817	-22.916314642	-26.813136229	-22.251647145	-21.761521082

```
## [1336] -27.415187673 -23.382868906 -27.316853337 -20.771452696 -23.852380532
## [1341] -24.224076605 -24.234578785 -19.010275082 -3.793533173 -0.994969556
## [1346] -2.252030515 -3.071656260 2.354033690 1.103389508 0.403592681
## [1351] 2.969281679 1.396432883 -2.927802170 1.753069365 -2.667740902
## [1356] -0.381111816 0.274638760 -1.655763733 3.745042580 -1.129165211
## [1361] 2.865868653 2.901026860 0.153763309 -1.226193321 -0.463506336
## [1366] -1.221230631 -4.670825541 4.167062212 -1.787792403 0.421861657
## [1371] 2.050620482 0.679028586 -2.501257118 0.035299052 0.223263774
## [1376] -3.907431337 -1.637556264 -0.339151242 2.578132647 -4.465602864
## [1381] -0.293996748 3.896745134 -3.557695079 0.039649863 -0.844905265
## [1386] -4.201945440 -0.040940281 1.431575563 -1.977949927 0.563289986
## [1391] 2.958313059 0.866824176 -1.436158547 -2.206041630 1.183857464
## [1396] 2.912161106 0.001044403 1.962677538 1.392177593 4.292592179
## [1401] 2.186482129 -2.408498981 1.092651837 5.802663086 -4.338949811
## [1406] 0.146338924 -2.101110668 5.027405729 1.449019832 4.834579023
## [1411] -1.703555536 7.321381483 4.880413982 -4.054888069 -1.966202120
## [1416] -0.526249581 5.760214615 -0.227855731 -2.984052863 0.807420327
## [1421] -0.768420655 -5.946716125 -3.128038923 0.271727389 -0.377058641
## [1426] 1.824388350 -5.174845631 -2.054897516 -0.321337301 -2.410040015
## [1431] -0.846966172 -4.238416095 -3.519742744 2.875111884 3.223616199
## [1436] -0.223002808 2.597556632 -2.516212991 2.735395826 27.744231360
## [1441] 25.889270021 16.588415541 28.250582084 22.050380986 24.533098417
## [1446] 23.233815519 27.320233290 25.605342422 11.624940238 24.377141476
## [1451] 22.572640439 23.779719851 21.037673462 19.833491825 -6.865763408
## [1456] -6.839821896 5.765378960 -6.105514496 -5.247168702 -1.246185345
## [1461] -2.635978926 -1.379758178 2.550529638 0.095597826 -2.405431087
## [1466] -8.669515916 0.819184580 6.167805899 -1.804190446 -6.474439457
## [1471] 8.966052437 0.301179361 0.597267398 2.286844764 7.753699286
## [1476] -2.803130494 -4.158993258 -0.035081473 -1.265832226 1.926087573
## [1481] 14.099226834 5.221160414 -3.616870300
```

```
diff(binary_data$x, lag = 20)
```

```
## [1] -2.933446707 -2.269162829 -6.310175726 -0.146117003 6.504153432
## [6] -3.825875307 -2.831316999 -1.467751441 -7.594995934 -3.256658069
## [11] 2.335901680 0.896292878 -0.877619656 0.145509973 -2.208359183
## [16] 4.390236411 3.230072437 11.905155387 -5.691140066 -5.149814779
## [21] -0.045922285 -0.328261870 3.323543579 -1.264083294 -8.331922269
## [26] -0.882596827 5.079811588 3.927785439 6.246652457 2.915014341
## [31] 1.736619206 -4.455608601 3.841759130 -5.511147985 2.919365189
## [36] -25.143131800 -19.543810424 -32.026468842 -17.983705869 -15.497659210
## [41] -18.760586396 -23.973080871 -22.124682918 -17.850626658 -17.224082461
## [46] -18.274877332 -24.073719281 -30.830606371 -23.571520681 -19.037440694
## [51] -23.017516068 -17.803951666 -21.338181657 -19.848444156 -22.738670353
## [56] -2.353317812 -0.323018889 -1.142663072 -1.872803933 -0.130856810
## [61] -0.404453090 -3.345469634 0.007879955 0.440237727 -0.968735148
## [66] -1.245282343 -0.960777182 -3.107458768 1.392789185 -1.984110613
## [71] -0.488975322 -2.409664037 -2.543659385 2.519961602 1.797899068
## [76] 2.703541070 0.886967903 1.622204486 -6.188686326 -0.361360939
## [81] -3.086765207 -1.478026227 -8.114021365 -5.528552972 -1.576348555
## [86] -7.268184372 -6.185803910 -4.591583601 -7.356344368 -2.729193527
## [91] 0.022182291 -4.052240388 -2.226169193 -10.257467760 -6.750112627
## [96] -7.604730060 -10.806789975 -6.366347869 2.086156445 1.164285601
## [101] -0.945899843 1.909913063 4.969827162 1.284366029 -2.277767694
```

##	[106]	0.162011594	3.277651806	1.500026478	-0.772028923	-2.468045458
##	[111]	-3.187440513	-2.103034816	3.282252514	9.577873129	0.980486749
##	[116]	3.323115527	4.287815026	0.442193813	1.645355573	-4.961636465
##	[121]	-4.919634464	-1.179029407	-4.237181785	-2.099884153	-2.900402357
##	[126]	2.940800965	-3.447644360	3.884594911	0.535343902	1.937391604
##	[131]	1.073200247	2.587526299	-7.193681109	-7.243810097	-0.984218475
##	[136]	-6.731436161	-1.342162903	-1.822628347	-1.503102507	1.932139736
##	[141]	56.865171014	47.430020920	56.619949787	53.311770912	55.761067312
##	[146]	49.455323433	53.558294610	47.159295517	55.922188394	53.279711042
##	[151]	42.831621460	51.323886294	52.844596916	55.341232835	52.485677919
##	[156]	54.631202005	53.668955744	56.151528653	50.203306697	46.885117223
##	[161]	-1.778824136	0.711609159	-4.534237362	-3.667268853	-5.168550266
##	[166]	-3.452061183	-4.916655852	-1.125397089	-4.482360557	-2.737713257
##	[171]	4.426630368	-2.543932887	2.471838572	-1.319929773	-0.357899663
##	[176]	3.625772612	-81.327218711	-80.707578510	-82.425061290	-78.571625039
##	[181]	-84.738361281	-76.083217879	-82.604849106	-76.121220572	-79.647695010
##	[186]	-77.370506392	-79.043465814	-81.168658703	-85.155231420	-81.490000536
##	[191]	-74.213943761	-82.474093458	-80.645830069	-83.557520198	-82.230077987
##	[196]	-84.071341290	1.998087325	1.316960481	-6.291703207	2.168619310
##	[201]	7.108698228	-0.127808008	49.366772910	44.581342794	44.697229103
##	[206]	45.652912829	46.010822761	47.925943103	52.462818908	44.286803244
##	[211]	37.749790514	48.018629881	42.717156353	43.876226391	44.578792175
##	[216]	47.023150282	45.923376589	36.884186172	49.112319993	45.000762871
##	[221]	45.525838022	46.199622002	-0.137900784	-3.148283457	1.098543035
##	[226]	-1.994611030	1.060951896	0.574130416	-0.472909874	-1.588338129
##	[231]	3.306395502	4.246790251	1.916726443	3.871823704	0.847803659
##	[236]	0.579174076	-2.517936183	2.152535807	5.233954671	-14.997557891
##	[241]	-17.571247427	-13.602576135	-17.983115719	-12.117220319	-11.668658678
##	[246]	-11.561414340	-14.914070775	-19.749298190	-13.711560976	-9.487825579
##	[251]	-9.414375202	-18.340451328	-15.745830564	-15.856379558	-15.561246521
##	[256]	-14.840192031	-14.585849149	-8.035099483	-14.493885888	-5.822960986
##	[261]	-0.337459167	-5.813332161	4.449730505	-3.426952540	0.316789080
##	[266]	0.860776216	0.794308614	0.709571656	-4.092954877	-2.060756020
##	[271]	-9.442676741	-2.661244864	1.560365918	2.731603759	-0.203236862
##	[276]	-8.436706198	-3.757396417	-10.062703025	1.009020867	2.168831911
##	[281]	-3.617558622	10.363220939	5.740439427	8.206987955	-3.866527095
##	[286]	-1.403316627	0.698108803	1.940302152	5.057020508	-0.699863250
##	[291]	-1.125494419	3.716302211	-1.213342388	-43.225669117	-29.503830111
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##	[306]	-31.644966205	-39.482862911	-32.383226893	-38.942075641	-41.651724829
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##	[316]	-3.008957519	-1.124904855	-8.312791659	5.229354636	-3.066503691
##	[321]	-8.845729701	0.635843112	3.446318891	-4.846783207	2.542630519
##	[326]	-7.513728032	6.210593977	-4.618490189	-3.111795947	6.824751415
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##	[341]	5.421888099	3.505862448	-1.815502054	3.192931462	1.481935184
##	[346]	7.171519519	-2.032411093	0.644956525	-0.509907422	79.500860977
##	[351]	75.171807040	82.101440544	80.361695932	80.606762674	79.666581342
##	[356]	75.567523848	84.587052860	82.246347239	79.349472819	83.795214911
##	[361]	80.526220804	73.044955422	78.826182719	76.636007125	78.898281040
##	[366]	75.455214729	80.075653829	80.832814538	81.897384485	2.052858536
##	[371]	-1.335340958	-0.149200167	-0.641568504	0.260473669	1.948334313

##	[376]	-0.801934337	-0.338789705	-0.639145957	-0.314636532	-1.137116296
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##	[386]	1.622716609	-1.472496424	2.979760407	0.197355126	-1.620575511
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##	[396]	-0.464352631	-7.218176403	-4.212339142	1.519941794	0.847711724
##	[401]	1.865099778	-1.488107186	4.121174744	-7.393733548	0.327923241
##	[406]	0.034716663	3.628562358	-62.424705989	-63.262458349	-66.607128778
##	[411]	-74.597212249	-66.122378256	-59.385596895	-57.985996843	-67.436314971
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##	[431]	9.714354954	-1.577277066	-6.309148086	3.264289742	-1.782154895
##	[436]	12.880511932	-2.165624957	1.466316287	8.117094089	-2.910107108
##	[441]	-0.266928303	-2.897897361	-0.526334866	-6.343584977	0.102277264
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##	[451]	-3.424882632	0.305721180	7.502897102	-2.413002272	5.730162306
##	[456]	-7.774969050	3.522459536	-2.441270810	-18.589163249	-19.207823307
##	[461]	-21.943191886	-16.334797976	-20.191172502	-23.617021685	-27.380998433
##	[466]	-7.163408017	-22.734076834	-26.490272531	-16.131961511	-26.311252454
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##	[476]	-24.864436889	-22.339269097	-21.790443434	-7.165138985	-6.837194543
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##	[486]	-3.801257884	-5.327009824	4.173155279	-0.193641459	-1.788541724
##	[491]	-9.121947096	-2.708830687	-4.269222295	-6.545670812	3.196191917
##	[496]	5.091010014	-0.560851321	2.917746787	-0.557789919	0.736220313
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##	[506]	-5.564560070	3.763945135	2.474007980	-3.579746758	5.533855640
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##	[516]	86.759263597	91.104322229	93.307455607	97.160210613	99.137946967
##	[521]	94.451098472	94.805226619	92.167842496	96.246048386	100.365241191
##	[526]	96.498538694	96.006401942	86.730910822	95.387752876	87.614793868
##	[531]	91.734996657	0.180404949	-0.462312114	1.203418281	-4.020362471
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##	[546]	-1.355365295	-2.472210537	-1.756795221	-0.097790244	0.013057682
##	[551]	-0.882800070	2.108676667	-2.737012413	1.112832024	-0.742006453
##	[556]	-63.312066067	-58.192407267	-57.547903172	-71.491914222	-59.530308929
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##	[576]	-3.136380977	-3.862484963	-5.718466591	6.300408309	-10.005347141
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##	[586]	-5.295490261	-0.258144024	3.730716557	-9.270273270	-3.706700420
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##	[611]	-22.410491948	-14.203422899	-25.207473664	-17.302330601	-15.385762256
##	[616]	-19.733366851	-25.291974019	-16.705575025	-21.262495404	-22.062889741
##	[621]	-26.454770419	-23.855092676	-22.773626312	0.226537157	-2.375123495
##	[626]	0.038906763	-2.827459386	-4.544595173	-2.185260461	5.346318012
##	[631]	1.191048805	-3.131018152	4.459059670	3.388343167	0.124427161
##	[636]	-2.708010086	-0.422792998	2.909384783	-1.282712779	2.144370485
##	[641]	2.697141322	4.272581347	0.695991852	1.463716312	1.171209731

##	[646]	-0.818162873	-8.197859258	-0.754964981	5.246450867	-6.376908221
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##	[671]	-13.585360872	-2.598210094	-9.891213250	-2.321335848	-11.631764482
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##	[691]	4.955020571	-9.124781375	2.509404997	92.618773144	103.237688395
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##	[706]	96.965118860	95.762676953	98.630110132	101.377211973	97.636566468
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##	[716]	-1.060147023	-2.331921814	-1.119927156	0.501161216	0.757024521
##	[721]	-0.763213154	1.650593464	-5.321922771	-0.612986373	2.182595191
##	[726]	4.638932060	0.642387073	-0.475217547	-3.564741160	1.407568042
##	[731]	-4.068133771	-3.282359929	3.042502854	-3.727912881	0.410747592
##	[736]	-1.547550976	4.213808314	0.091293849	-1.242351671	-1.499854331
##	[741]	-0.498181191	1.400941713	-2.990198437	1.128932053	1.238481405
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##	[766]	-79.944192439	-90.354644507	-0.996746220	3.999733887	-3.705459674
##	[771]	6.517333817	-1.264787289	5.757712692	7.179319595	15.335808267
##	[776]	-2.882053081	2.084930031	0.490181762	-8.151721981	-6.331189378
##	[781]	-4.256605364	5.099576541	-4.605602926	2.018566128	5.911199156
##	[786]	5.992610541	4.587259936	-2.820283030	-5.027847545	0.430085142
##	[791]	-3.598714052	-2.218985986	2.060062377	-4.452800195	-8.321909399
##	[796]	-1.435560142	0.868769153	2.423753060	29.783879551	33.916848692
##	[801]	27.785837279	32.503200301	28.953514072	33.604766057	21.305729088
##	[806]	22.496421411	26.163480704	28.112866711	40.767064559	35.174187682
##	[811]	23.953106429	26.418670855	22.654285276	25.185109798	15.532918386
##	[816]	32.673725059	37.034208068	27.586954170	-4.640714402	-6.384773217
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##	[826]	3.899925912	2.417860789	-0.853886968	-10.303514252	0.397469384
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##	[836]	9.198304591	1.131452629	-3.377181193	7.496488539	0.970181471
##	[841]	4.767571265	8.436653635	-0.259284112	15.964282285	9.273401799
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##	[851]	1.025837857	-9.544780695	-5.081211236	-10.772302817	-0.060256758
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##	[861]	-17.081342094	-27.988019456	-9.639719650	-24.500177100	-21.822789597
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##	[881]	-5.780477080	3.046757935	-1.853675217	1.264671043	-0.860711495
##	[886]	-1.938007158	0.253434133	-0.020530437	3.089884565	2.563006522
##	[891]	0.549521201	-6.684469289	0.550053087	-5.342764159	-5.414335527
##	[896]	4.664675980	-0.564676843	-3.671898241	-0.801983877	1.310510476
##	[901]	-2.145975253	-0.959333096	-3.165363410	-0.647520627	-3.288978041
##	[906]	0.607257885	2.555381464	2.146723586	-6.657559628	-3.013486554
##	[911]	-4.876797723	8.548818274	-3.531587320	8.562733728	68.813647041

##	[916]	58.342727516	69.795049984	66.396684290	63.921960329	59.813618304
##	[921]	64.530743212	70.059372975	69.400351740	61.528114383	68.411465528
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##	[931]	66.791001296	61.117685888	62.282275516	68.022530425	-1.224672124
##	[936]	4.041854222	0.810316625	-0.783282472	3.550489296	2.852459979
##	[941]	4.628746875	-10.089160677	-1.419100147	3.869727893	1.998831799
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##	[951]	-0.062533642	4.391958765	-0.006341148	-3.294202809	-0.955756453
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##	[961]	2.624260480	5.060268462	0.348924438	-8.462252103	-1.096919420
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##	[986]	-67.297478385	-7.361869637	4.684741738	-1.400484749	2.553171707
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##	[996]	-4.998599511	5.476924933	2.701727606	-5.956306204	-0.212238869
##	[1001]	-1.688686351	6.228945420	-7.428207488	12.704764643	-3.244655758
##	[1006]	2.548286781	-3.462249247	-12.239814982	-5.346057118	-1.479570372
##	[1011]	4.879022483	-3.079985173	11.204639903	3.407488439	4.380895301
##	[1016]	12.010707699	-10.103443055	-1.240857182	6.693696793	44.043311623
##	[1021]	36.313463270	33.336441222	42.885152011	26.844623179	43.338740014
##	[1026]	35.049909735	48.439710158	41.616206457	41.590178729	40.795689874
##	[1031]	39.374306687	38.276049246	32.058746694	32.209690489	31.797646560
##	[1036]	28.686847965	35.822692193	41.058646891	37.132335393	-0.279839471
##	[1041]	0.911560975	-1.059010753	-1.241094995	1.280982922	0.481989785
##	[1046]	1.408593609	-1.586888259	-1.627766862	-0.662442694	0.204730736
##	[1051]	1.704046555	0.273481671	0.144623011	2.422302692	-0.310899744
##	[1056]	-1.020629718	1.514597552	-0.516849940	0.224303216	0.717989651
##	[1061]	0.281128693	1.406412703	1.126555649	-2.230659452	-1.001466030
##	[1066]	-0.689728055	1.536978843	-1.759934968	-2.163750737	-3.200379830
##	[1071]	-1.223014134	-1.353546856	0.911484531	-0.042924608	-1.199625620
##	[1076]	6.193143332	7.601090054	11.468293549	7.470436216	10.971950985
##	[1081]	8.257338599	9.998450671	7.005336097	7.225912576	11.023872755
##	[1086]	7.008091554	7.889825448	12.374381622	10.362412432	11.107728901
##	[1091]	11.146564329	9.827158940	8.917980685	11.583385212	9.190941994
##	[1096]	2.829512237	-0.338723110	-2.086294721	2.471352963	-3.140732371
##	[1101]	-0.027105260	-2.470131049	0.040305543	0.044102002	-0.913970355
##	[1106]	5.108362358	1.622556281	-3.283479407	-1.393796454	0.092422454
##	[1111]	-2.738657856	-1.624615759	0.829386412	-3.646461875	-0.165435903
##	[1116]	1.982042959	-34.793881647	-24.853853977	-16.243832738	-23.673197342
##	[1121]	-32.248960848	-27.931835216	-25.924786213	-26.228259161	-30.349301242
##	[1126]	-28.602988831	-26.370454642	-19.876176972	-21.125822520	-21.874643234
##	[1131]	-23.186829542	-24.250283066	-30.124607489	-27.595972382	-25.931578445
##	[1136]	-27.512848218	-0.945389950	-7.115812816	-11.568426323	-1.550910459
##	[1141]	4.278754759	7.140750093	0.078346718	3.179762975	28.748454963
##	[1146]	24.207955055	25.973611151	18.515634772	19.744932835	11.664841524
##	[1151]	20.884517467	16.136777816	23.948398884	23.836084970	27.645220751
##	[1156]	9.928742590	27.900349818	25.394204205	17.620559836	20.131858048
##	[1161]	17.096079329	17.959157356	25.110488580	24.170791664	4.766944716
##	[1166]	3.930466941	-7.682085457	5.712728593	-4.140778523	-0.391854957
##	[1171]	-2.486692665	7.784726499	0.868565277	-1.146051589	-5.520745605
##	[1176]	13.628052911	-0.296234368	-3.805638969	-2.058804756	-5.117761777
##	[1181]	2.261582240	0.209759314	-5.183761832	-10.633212171	-7.443710740

## [1186]	-3.396250882	-2.937893087	-9.288015861	3.982363416	5.429760535
## [1191]	-2.048002075	1.264707909	0.174550465	4.476393375	-3.316281213
## [1196]	0.188983882	7.900868252	12.040669906	8.585795113	7.166707051
## [1201]	2.879432770	0.321064607	-8.880317578	-8.997301319	-14.013034490
## [1206]	-20.624262051	-7.754496062	-13.005475470	-16.229806421	-14.279925865
## [1211]	-15.128895456	-16.832635943	-14.736449835	-18.885364131	-7.034527391
## [1216]	-18.293177479	-14.181975827	-18.706214195	-19.855914025	-12.992729132
## [1221]	-11.795979048	-11.965278660	-2.276033042	3.851964449	-0.947676788
## [1226]	4.016039117	-1.109953896	4.099660179	1.805636446	1.764924626
## [1231]	6.899975114	-1.592732405	-1.617360677	3.266340090	-0.635164742
## [1236]	4.151923700	-2.038125323	-2.582222009	5.601493711	-3.033050808
## [1241]	3.338180950	-3.578333751	-2.138302484	0.101764020	0.498311506
## [1246]	0.672611371	-0.860328194	-1.661616526	-1.858181471	-4.189491288
## [1251]	-18.217521703	-18.013905338	-16.749107783	-19.851595035	-20.963603305
## [1256]	-20.731343870	-27.549839089	-14.624861703	-19.183582420	-20.764726364
## [1261]	-25.746238557	-22.568103652	-15.882196075	-18.001794868	-19.268751542
## [1266]	-21.274079131	-19.331340100	-20.138497746	-17.991739724	-14.225585084
## [1271]	-2.834762273	0.605106459	-2.693750760	-4.884965757	4.974877851
## [1276]	-5.343682279	5.172681827	-5.077579709	-1.576437381	-1.458279067
## [1281]	1.498776079	4.465494641	1.765615789	-3.976840517	-1.390647209
## [1286]	1.253380206	0.136336931	-0.531476438	-1.488216084	-4.503207031
## [1291]	-1.330927282	-0.908605621	4.133694227	3.019871722	-2.892377303
## [1296]	8.079412000	4.043116184	2.291270300	1.767541665	0.327661426
## [1301]	0.762711682	0.301277142	0.402500672	2.564373607	3.982126160
## [1306]	-2.162984892	1.449325456	6.413016090	0.983101101	1.351217470
## [1311]	0.320947724	1.049406211	-1.472591913	-2.284844539	-5.404429780
## [1316]	-3.064299156	-4.678353743	2.252562840	-4.311867068	4.356918483
## [1321]	-0.078075768	-1.500486101	-5.408004576	-24.424966279	-23.136542510
## [1326]	-22.147290762	-22.091170060	-32.041161531	-24.382884979	-23.023274836
## [1331]	-28.053041970	-27.250659321	-24.915082307	-20.484784190	-20.842871142
## [1336]	-23.655362813	-21.964463647	-24.366531768	-25.237272176	-23.730370391
## [1341]	-26.221842828	-24.390295626	-21.504616885	0.008812859	-1.632036956
## [1346]	-1.044807474	-2.937911797	-1.029748247	3.519932321	-1.749090962
## [1351]	3.378713045	1.693044019	1.294557837	-0.720776900	-1.007155070
## [1356]	0.868102430	2.745310019	-2.340578493	2.576152712	-1.100573736
## [1361]	-0.014007591	-4.537081078	0.783280275	0.628750410	-1.730821986
## [1366]	2.460051848	0.975639723	1.721102888	-2.438547213	1.883849607
## [1371]	-2.658217091	0.833114995	-1.023966003	1.409242779	-4.437011390
## [1376]	-3.173872991	-3.541362803	-2.928178112	1.894593594	-2.112220915
## [1381]	-0.520662960	5.605524983	-1.014383761	-2.628704738	2.025277935
## [1386]	-1.750524514	1.020910585	0.041132569	-0.832097903	-3.476417700
## [1391]	3.645719452	-1.902762136	-0.626349332	0.708638541	6.645974129
## [1396]	1.959815916	-0.699719132	3.635963155	3.134308485	-1.468766612
## [1401]	2.597759850	-1.039259802	3.636962734	2.594871856	0.794871337
## [1406]	-1.016149143	4.551795171	5.690223197	-1.140207898	3.495914544
## [1411]	-1.478594771	5.059451080	1.445429886	-1.241921971	-4.953938463
## [1416]	-0.357142934	-4.577476945	-0.583728026	-2.936063841	4.756762508
## [1421]	0.661900283	1.478060209	-1.392080049	-2.910565031	-3.748704493
## [1426]	-0.622005407	-6.500346498	-6.954726840	5.688077981	0.235879855
## [1431]	-0.053896161	-7.740134929	-2.872085285	2.783384847	31.693573541
## [1436]	27.319590959	24.013191874	29.986540958	18.868088566	21.161452565
## [1441]	20.787421762	25.994732423	20.705513099	17.634355519	27.023061347
## [1446]	23.365710451	20.278001016	21.685330920	19.741764788	21.604193934
## [1451]	20.702771870	27.181014202	26.397239452	10.885524039	-7.828964140


```
## [1456] -7.737827185 8.026558704 -4.994539347 -4.320427640 0.084531843
## [1461] -8.537620985 -6.223047694 2.247794397 6.312634105 -9.247386999
## [1466] 7.096183868 3.702473712 5.956833389 -6.661123022 6.790498554
## [1471] -3.701135783 -1.897813514 1.075893677 -0.339091165 3.256804761
## [1476] 8.197584776 0.377870898 -3.919605542
```

```
diff(binary_data$x, lag = 25)
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```
## [1] -2.474405881 -6.877945034 2.323460225 -1.246230024 -3.294052020
## [6] -2.691975611 1.072324530 -10.435068294 -0.234438629 -0.542355430
## [11] 6.418755964 -2.499717462 13.048500767 -4.220529399 -6.330705754
## [16] -1.331480680 7.002961583 1.636259445 -8.849628271 -2.275487665
## [21] -0.423556001 0.471029383 12.561421390 5.146539436 -6.883191111
## [26] 2.870518902 -0.551967072 -5.125557723 1.849409320 5.633667828
## [31] -21.060277516 -22.939820763 -18.100348418 -22.349745241 -19.620005781
## [36] -24.482303487 -20.200191725 -32.393578860 -21.009114863 -14.349755347
## [41] -18.652511049 -23.274428028 -21.592728560 -17.160897951 -17.588709536
## [46] -19.264400339 -23.435730327 -30.391524819 -24.245687293 -20.020016866
## [51] -25.150214535 -18.807231051 -23.084770620 -18.711401189 -22.670227780
## [56] 0.256375223 -4.001850935 -0.359230063 -2.585171267 0.179168716
## [61] -1.137206995 -0.262124339 -2.575504411 2.082517892 -2.348737688
## [66] -1.478498329 -1.771675082 -2.104577833 1.845794990 0.815322897
## [71] 0.570842603 -0.116311482 -0.124384477 -5.051643359 -0.292918366
## [76] -0.477072171 -5.156858273 -7.330588355 -6.240920306 -1.266323029
## [81] -8.000938277 -3.102458616 -7.174967968 -5.714064204 -4.109196067
## [86] -0.211033696 -4.863138288 -1.223288257 -9.804461956 -3.950679118
## [91] -6.544912135 -8.513437420 -3.947072961 -5.485448516 -0.926531834
## [96] -4.126513084 -4.133913113 -3.982965680 1.232132049 -3.182729783
## [101] -4.752161477 1.653219418 2.439079876 -0.957540154 -5.000892970
## [106] 3.869710163 -0.780369194 6.650547858 7.129755541 -0.240998842
## [111] -3.243978899 -0.173382006 -1.278709955 6.417374817 0.861944328
## [116] -1.441417487 5.493847455 -1.853799595 -2.953908549 -7.247417742
## [121] -0.865460668 -3.704338006 1.353847625 -1.706562281 -0.785733673
## [126] 4.780898817 -1.470494702 -2.043159729 0.657974366 1.242828141
## [131] -6.787974547 0.587489907 -6.383590816 -4.663600818 1.813597315
## [136] 52.100638000 48.636053349 54.323956379 48.712506790 53.475286036
## [141] 53.509497228 51.032986011 52.750324926 56.315510266 55.394379727
## [146] 44.671719311 53.301035952 46.916842276 55.463863299 51.791114456
## [151] 46.770027212 51.668919353 56.961618945 52.783515976 49.682933013
## [156] 57.053250025 50.689825411 51.612347363 46.548340444 46.374596034
## [161] -6.807734969 -1.313690761 -4.995021950 -1.478621203 -3.104400843
## [166] -0.356973754 -2.801191545 2.229385331 -1.778254869 -1.846496250
## [171] 7.564178364 -80.982185652 -76.590556481 -84.982778148 -81.374369945
## [176] -82.316313261 -79.062348213 -87.144030395 -79.776186825 -80.158216199
## [181] -82.399417225 -81.068765733 -81.629443291 -82.966583770 -79.425851112
## [186] -71.118856332 -80.358629150 -77.291047649 -80.853414509 -81.338860979
## [191] -80.933793294 -76.440165440 -77.745434572 -89.954551581 -78.847850971
## [196] -78.833387645 2.137062490 42.930321025 47.230217258 43.110637943
## [201] 47.991856885 41.025274907 48.901348919 45.617455709 44.508647141
## [206] 44.001440575 46.703466545 46.594767407 48.178043302 44.729931731
## [211] 40.303300749 51.957304606 39.784581668 42.715288609 48.382989886
## [216] 50.763791668 46.338597168 41.475459759 50.373637008 42.040561668
## [221] 38.888547626 42.214034811 0.108706425 0.563203042 -1.776920091
## [226] 1.654923248 4.939434035 0.585550747 -0.412951901 1.290932147
```

```

## [231] 3.132684311 1.420738542 -0.780038878 4.073016889 -11.193360180
## [236] -13.830606042 -13.187355556 -13.391842131 -10.855903304 -14.628859881
## [241] -18.198704736 -18.899657967 -19.502690981 -10.000074477 -12.363288704
## [246] -5.764840925 -14.461969189 -15.734410234 -15.796421586 -12.681976245
## [251] -15.013903222 -17.411900857 -10.731864803 -14.292692703 -17.864124825
## [256] -14.747239285 -16.482751535 -11.094647433 -19.516810515 0.685487091
## [261] 0.233318907 -4.502773217 -0.810003607 -1.975809035 -2.755386046
## [266] -3.646103326 -2.209143278 5.575253875 0.646743150 -3.397387528
## [271] -14.036234218 -2.828845946 -5.048737264 2.572707721 -0.134046392
## [276] -3.524605875 8.466318553 2.680891477 3.184063328 2.641920981
## [281] -0.832538553 2.008667747 -3.319431959 6.508164014 -3.772038377
## [286] -5.632373962 0.712850318 3.652339830 -38.485971091 -30.840461620
## [291] -32.932575337 -33.166880468 -32.109687142 -38.375806568 -34.949153447
## [296] -26.701860771 -31.340158419 -30.303294091 -36.061666296 -37.934840077
## [301] -28.859946136 -47.837416103 -41.443098279 -40.640899582 -41.557236111
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## [311] -34.816038437 -38.008087535 -39.209136412 10.079217185 -8.511827027
## [316] -7.208572612 2.294964080 -1.356391240 -2.691538973 -0.373865642
## [321] -4.759713074 1.937051263 -3.014699875 -5.515986772 3.675444451
## [326] 0.849729206 0.239165436 -1.996244575 -0.157606403 5.317068857
## [331] 2.432637784 -11.955082899 7.782439186 -0.630809695 -4.915956114
## [336] 1.222273005 6.925731384 5.140898364 -4.727962147 4.174573234
## [341] 11.257536147 -0.731202942 -5.816062241 -1.179110987 80.633674910
## [346] 83.535264278 76.130012002 82.983941546 83.560952218 78.158898785
## [351] 73.824161739 82.644384505 82.765173653 81.865771238 82.866849968
## [356] 75.241997147 83.163706616 80.330627402 75.027654189 81.683449792
## [361] 81.290862777 75.838588438 76.832254351 77.525342037 81.204598261
## [366] 75.028403800 78.013222928 81.697416517 84.331333309 0.606372120
## [371] -2.149579638 0.204154256 1.764331764 0.944372032 2.063152330
## [376] -3.150086595 0.331112337 -6.073184846 3.356242067 -2.423412489
## [381] 2.387358582 1.321136592 0.985832039 1.086690038 0.685741710
## [386] 2.974618751 -0.992655269 0.731787907 -0.544856115 1.065463919
## [391] -1.278591310 -6.864821979 -1.806438873 2.203840157 0.962529741
## [396] -0.483052480 -0.818205143 -1.312864145 -3.722854949 -0.958372953
## [401] 5.246635138 3.195240368 -57.281408940 -69.853829008 -65.609739697
## [406] -73.245310108 -65.642537101 -61.633569395 -58.728208084 -64.750275541
## [411] -69.414719195 -64.304248355 -64.350043423 -70.306312852 -66.134535537
## [416] -60.382965533 -54.239783635 -61.922845334 -57.253953671 -68.080140242
## [421] -64.955210977 -64.864001677 -59.362447869 -59.520177017 -59.328118084
## [426] -63.565671817 -70.848376525 -5.518011492 7.798540007 0.074698342
## [431] 18.063004986 -0.347495055 -3.498130241 -4.203221920 -1.608327675
## [436] 4.084804369 -0.768030253 0.227238423 11.891419300 -3.392748033
## [441] -8.881200376 -1.646875814 4.274171976 -13.662307001 8.081289141
## [446] 1.346191888 -0.995306114 -0.055250206 2.445619292 -0.804684205
## [451] 0.573680982 4.752241547 0.369747035 -26.056674912 -19.033996087
## [456] -30.738899449 -14.937203272 -21.430250366 -19.842696474 -27.863639358
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## [471] -20.865873275 -17.892748730 -28.923593502 -30.808811625 -31.601352936
## [476] -23.304250803 -24.841277648 -17.018705186 -2.988714866 0.176227328
## [481] 2.364253912 -10.475267136 2.674562092 -0.027303309 7.260216132
## [486] -10.528380889 4.156365270 -3.600418438 -8.868129835 2.684666869
## [491] -1.568574479 -6.157396256 0.946072240 -4.313274804 -5.982390986
## [496] -0.840952542 -1.794417724 1.679436799 2.699912379 -0.978494560

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##	[501]	-2.859985753	-0.329707159	3.178295701	-1.871868427	3.962028392
##	[506]	-0.478363783	98.278770950	90.733637105	89.566813890	96.450928778
##	[511]	94.312636213	87.655756659	98.522750142	99.392606621	89.959364064
##	[516]	88.519135916	93.571660217	90.929532507	99.503750684	98.650526318
##	[521]	96.039691568	94.969103955	93.001507974	94.992396189	99.568738692
##	[526]	96.821192944	94.695230764	87.797317012	94.349978930	86.896710667
##	[531]	90.063004307	-0.250167476	-3.745041153	3.719553984	-2.367208694
##	[536]	2.946174813	2.213746201	-0.136450543	2.378699810	0.618428040
##	[541]	0.233227802	-2.308333201	-0.923129744	-1.351442441	-0.783444817
##	[546]	-0.560145819	0.797505488	-1.670606224	0.075058078	-1.460089654
##	[551]	-64.984058417	-58.622979692	-60.830632211	-68.975778519	-57.877155151
##	[556]	-64.000742326	-66.338965741	-61.955176800	-61.588197847	-70.227030412
##	[561]	-65.733963898	-63.060801220	-70.736865666	-55.980537520	-63.769868773
##	[566]	-64.018091058	-57.219794698	-56.764989147	-59.616846351	-64.369006386
##	[571]	-67.237639325	-64.594141322	-63.812086389	-63.788202235	-67.140495840
##	[576]	-0.634524805	-3.802548991	0.874488343	8.925710120	-4.846710285
##	[581]	-6.081664336	4.344294978	-1.426842379	-3.852162762	3.717741830
##	[586]	5.306610888	-2.694978708	4.709090179	-13.731217382	-3.577702747
##	[591]	5.758274796	2.315764142	-10.500759710	-2.152707262	4.006348930
##	[596]	8.447910687	-1.229137173	3.528223979	-16.706068949	-13.400344874
##	[601]	-17.578112209	-14.976013618	-19.333281289	-18.965874921	-21.370613078
##	[606]	-11.808390799	-16.640257583	-24.229100043	-21.763274714	-15.256764583
##	[611]	-18.518904795	-16.494966061	-21.108150696	-14.706896297	-16.967269182
##	[616]	-26.189463319	-31.504624590	-15.705550868	-18.325332092	-24.026454090
##	[621]	-23.485259962	-16.514399859	-20.813145506	-1.819764622	2.534686665
##	[626]	0.824954425	-4.794976621	-7.145363435	-2.283213132	4.106006288
##	[631]	1.183577067	-2.714336160	7.008707752	1.312721526	0.562863560
##	[636]	-3.758955146	-1.940069224	1.696016009	4.400879625	-0.792354618
##	[641]	2.151347585	-0.857166441	1.205515825	3.200149088	-1.467098061
##	[646]	0.521469144	-3.378146570	-2.934156818	-2.198036965	-4.912441736
##	[651]	0.187777713	3.646865523	-8.169975032	-16.189707185	-9.433178089
##	[656]	-13.040597742	-11.105169093	-7.470876275	-5.872112688	-10.066341772
##	[661]	-6.640863967	-10.182819344	-9.308173091	-12.435101822	-11.279653363
##	[666]	-12.245728855	2.221502593	-12.070405086	-9.765823680	-10.167297997
##	[671]	-11.649864682	-11.940882903	-9.170663204	-6.788629111	-11.809698516
##	[676]	-8.207201148	-15.557500822	2.271492329	7.867850715	-1.748029152
##	[681]	-0.304575373	-1.010780406	-4.894840596	-6.042136097	-4.065457016
##	[686]	-1.195638055	-1.850207225	0.256696974	97.024484062	101.711735969
##	[691]	98.207746725	88.138138267	100.396964679	88.212505375	99.629137809
##	[696]	96.209448647	97.830890922	100.948164814	92.760776835	95.462448860
##	[701]	91.631897442	95.974044744	94.712524046	95.709198016	95.124411320
##	[706]	100.353762195	98.733347768	96.888567162	100.701044059	96.369483363
##	[711]	92.192579131	94.930997827	96.767632525	-3.905106554	-2.851526065
##	[716]	-0.826015041	2.000673309	-4.050172590	-0.532008176	-2.162027792
##	[721]	3.956400619	0.226417835	-3.105289258	-0.049463043	5.370151789
##	[726]	-0.679490435	-0.311689114	1.300959884	-4.404080796	-0.856335513
##	[731]	-5.251008007	-1.022894922	2.071231193	-3.661278855	0.906292531
##	[736]	-0.264049209	5.733536837	-5.920443870	0.095762662	-1.680570909
##	[741]	-0.563331372	5.255520434	-76.777951392	-78.653892981	-76.968324006
##	[746]	-86.763903627	-75.768672346	-88.344937419	-78.586673388	-87.963787710
##	[751]	-78.281252741	-81.016040873	-79.160417737	-70.486485594	-77.056654794
##	[756]	-72.407706480	-84.767506661	-78.168513959	-81.763134333	-78.895706051
##	[761]	-80.009342619	-86.500065786	-74.784499175	-75.783091147	-81.912265085
##	[766]	-74.963624665	-83.713155698	-3.592639822	7.810062516	7.527901161

##	[771]	0.282175310	-4.116514683	11.450878874	-0.890873823	2.312039984
##	[776]	0.434066660	3.607575760	-4.584970809	-9.191448584	4.567692838
##	[781]	-0.325523831	4.374429333	-5.448005966	2.290309973	-2.767190469
##	[786]	1.381853722	4.422502823	-0.535831224	-0.642471565	2.911451436
##	[791]	-7.670718649	-1.982958241	8.116919243	21.713686134	20.893080409
##	[796]	31.101957021	34.025846030	23.878361500	32.565039454	32.204611303
##	[801]	26.427502944	25.438333495	27.270463671	41.038808404	26.495798057
##	[806]	19.342349610	26.253913743	24.938737081	29.570485778	18.014284679
##	[811]	28.601720462	37.270235813	33.643811035	21.525771926	22.830216591
##	[816]	29.675708862	26.807851527	17.923685819	-11.499085620	-7.679911225
##	[821]	2.541591577	-4.647006017	-2.536937368	-2.869471904	5.587538353
##	[826]	5.823997087	3.233434027	4.202755756	-10.236610346	-2.809377513
##	[831]	13.846918623	11.983017587	7.612344567	3.837150668	8.267479677
##	[836]	1.769555068	-1.789702905	-9.922552463	9.105911068	7.978263791
##	[841]	8.275291996	-4.926167085	7.321682330	15.716667031	3.700555382
##	[846]	2.949909033	-8.729207458	-0.024568512	-10.705398912	-3.267103655
##	[851]	-8.006849155	-12.001504966	-17.662377093	-18.568759275	-25.391749979
##	[856]	-24.510091617	-30.909174991	-16.185090921	-22.890754571	-14.814707277
##	[861]	-21.400613165	-24.859349792	-15.229142735	-26.173007382	-21.341547075
##	[866]	-23.300908546	-11.234601079	-18.118616876	-26.191391539	-11.510466101
##	[871]	-24.474844227	-13.288403098	-10.834459750	-6.576669488	-16.740919049
##	[876]	-17.414869807	-7.020895491	-0.140929862	-0.180142021	3.633285394
##	[881]	-6.257278229	3.382103797	-5.609953522	1.417054282	3.044249044
##	[886]	2.156946552	-6.422541296	5.241545388	-5.608763570	-1.156100969
##	[891]	3.568757213	-4.719299902	-2.740006704	3.801445850	0.667610680
##	[896]	-4.118687845	2.851450241	-5.052999380	-2.047449617	-8.246266820
##	[901]	0.130456735	2.890727326	-1.609554719	-6.505176389	0.891473985
##	[906]	-0.781844013	1.872842845	1.730488505	-0.135914407	65.094539550
##	[911]	61.361963528	71.760219370	63.106624499	73.066170338	65.895564510
##	[916]	55.747379387	73.475500059	68.019250601	60.282648642	58.854688232
##	[921]	64.718832220	66.358735482	65.193186321	65.906755600	71.925984339
##	[926]	65.401899398	60.435147270	61.866040435	74.544175646	66.883353980
##	[931]	70.280615473	64.021717721	65.854929348	68.053925907	-0.065622552
##	[936]	2.033398746	-6.408710602	0.203466164	0.230416206	1.039901728
##	[941]	8.002838889	-2.755221387	-6.130017379	-2.007809329	5.126806507
##	[946]	2.896965524	2.318430975	-1.777678344	-0.514438525	-1.817934786
##	[951]	-1.803795146	0.476639606	5.504161072	1.513706527	-9.088819346
##	[956]	0.615805004	-2.158758764	1.335673073	-11.782325193	-2.909477671
##	[961]	-0.210284522	-60.382094830	-63.612552239	-62.749397022	-69.882241993
##	[966]	-68.131100511	-69.741707786	-64.774176993	-66.415114384	-64.628089563
##	[971]	-62.971648964	-64.047263835	-68.466138750	-66.733236676	-72.505340026
##	[976]	-60.240848138	-67.650048822	-66.787304358	-73.648549291	-62.745429593
##	[981]	-70.132023387	-72.804232929	-59.276734939	-55.687629668	-66.232150866
##	[986]	-72.966490817	1.854825678	-11.022112714	-3.347066441	4.943163005
##	[991]	-4.756932320	12.544383752	-0.845060535	-0.402416475	-11.519711813
##	[996]	-0.699147028	-1.289158726	-0.238870876	10.597361364	-1.617808218
##	[1001]	-1.433674141	-8.347799891	-5.325079730	-0.649773733	2.372099602
##	[1006]	-0.789989949	6.136710141	-4.502214549	1.460906747	6.770886599
##	[1011]	15.673542220	-1.439558646	3.063653012	0.095092175	35.962563942
##	[1016]	40.612915753	26.570357563	39.944553529	43.398290746	41.933170665
##	[1021]	35.304921945	33.862964846	43.719334215	28.235640352	46.412445234
##	[1026]	36.036029957	47.875008635	39.796347128	39.016654354	40.048103531
##	[1031]	39.481367702	37.463118721	32.917660000	33.819939130	31.301829171
##	[1036]	29.513769028	35.614789864	39.944315716	37.985576875	-1.628151173

## [1041]	0.400052284	-1.060364635	-0.793584658	0.728574480	3.278435956
## [1046]	2.690166777	-0.291219852	-1.675236318	-0.151221683	-1.058486087
## [1051]	-0.913568702	0.701667026	0.342063366	1.834551858	0.222172262
## [1056]	1.108049756	1.198510374	0.012224474	-1.377417971	-2.349777732
## [1061]	-1.201236746	1.535624961	-1.312424631	-2.716159179	-0.403933659
## [1066]	0.058559034	-0.057878449	0.864015074	0.468296403	-2.462842443
## [1071]	3.575528074	8.029275410	11.665733904	6.882685383	11.505022991
## [1076]	10.386018074	9.682363493	7.534410511	5.624191389	7.956105371
## [1081]	5.525726115	8.019037707	9.935401342	9.876912705	11.705261272
## [1086]	11.894851417	8.232301649	11.541930727	14.215432352	9.928479381
## [1091]	7.628054445	9.044099156	8.667954652	9.396962953	9.563916241
## [1096]	4.165769482	-0.388857610	-3.893577494	-1.802142826	-3.929815970
## [1101]	2.376749873	-0.356856683	-0.353414163	1.257203676	0.773810971
## [1106]	2.148102007	-1.282139559	-0.003064484	0.206558045	-1.344685423
## [1111]	-1.536466924	-35.576941432	-25.103880010	-18.430254996	-23.300223095
## [1116]	-30.912703603	-27.981969716	-27.732068986	-30.501754950	-31.138384841
## [1121]	-26.199133697	-24.257180276	-20.269896678	-19.912720846	-20.186861908
## [1126]	-26.147089892	-27.154978906	-26.844192565	-25.995617883	-27.368686322
## [1131]	-26.310657286	-34.897715623	-33.049079238	-26.352219445	-24.685697651
## [1136]	-28.615991803	13.952662024	-2.799868291	-11.078159236	21.283267464
## [1141]	30.257782205	29.648266091	24.170524307	26.060471150	21.827280859
## [1146]	23.340416406	15.352253553	16.980383291	18.966289607	22.151177663
## [1151]	6.804914845	17.252917261	22.469732456	18.864312774	21.377738843
## [1156]	15.992935744	32.857209330	29.426433104	24.661058751	27.601122638
## [1161]	29.909494387	14.825430541	29.804906182	18.739929652	-7.313029062
## [1166]	-3.354231313	-2.836631100	-0.666686204	-1.924694817	4.965590533
## [1171]	-0.451549712	0.819905076	-5.284305397	-7.030576953	-11.385243686
## [1176]	8.325775394	5.166618827	-1.151532933	-3.592713257	0.025553850
## [1181]	9.417164177	-6.071619902	-4.593598259	-1.448498596	-6.650213242
## [1186]	-9.332700330	6.110162267	-6.204864331	6.692477081	2.041164278
## [1191]	2.224126835	0.936046828	5.887799231	2.701269749	1.302208970
## [1196]	-2.422844747	5.783917802	-6.226211541	-10.531209819	-8.869718862
## [1201]	-13.468680115	-14.035875279	-12.415311897	-7.045092845	-13.486428368
## [1206]	-21.065344904	-7.784580589	-11.653298305	-16.175250466	-10.423123649
## [1211]	-14.021048569	-14.510636908	-12.992965429	-21.631037651	-8.374238949
## [1216]	-14.407807676	-14.082229110	-20.542914489	-15.265040483	-16.984102702
## [1221]	-12.332073767	-15.466893781	0.564665860	3.757844919	2.291530748
## [1226]	6.458892262	-1.622816932	-0.265183512	3.320896044	3.221637475
## [1231]	5.259770587	0.283873712	-0.838737604	2.855820190	-4.372762365
## [1236]	7.223550752	-3.478587034	-3.975002777	4.692637562	-3.493062064
## [1241]	0.136516651	-4.361943315	1.179082376	-1.952301001	-0.950283751
## [1246]	-15.774668558	-18.526768374	-21.113951474	-18.336335437	-19.506890456
## [1251]	-22.371548397	-25.673232972	-13.846238629	-19.594102319	-24.502323987
## [1256]	-22.674611505	-24.008565363	-17.274976843	-18.910651017	-19.728762798
## [1261]	-24.475743429	-20.114949664	-16.821112886	-20.045804744	-15.674180341
## [1266]	-19.282042202	-17.061333721	-22.146085708	-21.363119723	-10.342521316
## [1271]	-9.497708973	-2.486645808	-2.174710555	-1.318944665	-4.996999750
## [1276]	-0.444491556	8.006768366	-0.884499351	-3.703909114	-0.354683643
## [1281]	2.523875333	2.589490919	-1.470393249	-3.532225960	-0.908635831
## [1286]	0.661109646	1.361400758	2.126106265	-0.351508277	0.990686465
## [1291]	1.416465300	0.951363917	2.810310504	5.333562757	-9.644216176
## [1296]	5.661902406	3.135363681	4.595581030	0.436901874	5.085721583
## [1301]	-1.137885637	-0.426678265	3.177007052	1.427715658	1.833228848
## [1306]	-0.271322836	2.274470038	1.184990789	-1.148136732	0.089463716

```
## [1311] -0.316906573 -2.818384204 0.929179117 -1.998176033 -2.394920390
## [1316] -2.495585363 -2.408238604 -3.103693845 -25.755606070 -18.378482352
## [1321] -24.047888081 -22.819125467 -29.266655151 -25.519542928 -25.172172147
## [1326] -26.161379915 -26.425514740 -30.143107608 -22.616022023 -22.104624896
## [1331] -24.293217109 -25.832254062 -21.964760737 -24.950603670 -20.720861001
## [1336] -25.653129035 -22.120180487 -26.860873570 -21.434926143 -24.367437791
## [1341] -25.014619787 -24.256551162 -24.888398822 2.425355672 -3.784720600
## [1346] -0.635376108 -2.641300660 3.192611760 1.046086055 -0.088505130
## [1351] 4.627927291 4.163715278 0.609743076 -1.889666768 -0.978563595
## [1356] -2.011773813 -4.692797918 -1.711061527 4.431096442 -2.367889386
## [1361] 3.667274888 1.109384187 -1.662679049 -0.022004401 -0.268834037
## [1366] -2.248785725 1.129726132 3.198394004 -1.064603487 -2.776425558
## [1371] -1.924658745 -1.070691543 -3.612992873 0.725703726 -2.083629440
## [1376] -3.400539204 -1.832582954 -0.384866795 -0.773761007 0.757962285
## [1381] 1.930757966 6.667375849 -2.404826756 -1.482852714 -2.014429750
## [1386] -1.063118121 -1.748675727 0.850941783 2.082582267 1.985698964
## [1391] 2.693374262 -2.603525671 1.046936285 2.450769432 0.884615338
## [1396] 2.371093637 0.669520047 6.180274052 -0.073482745 3.665054537
## [1401] 1.435271783 5.613646038 4.299780202 0.005644126 -0.543793141
## [1406] -0.791188378 2.289864768 2.255239100 1.672758199 0.508178201
## [1411] -1.309488124 -5.278240481 1.089557591 -1.193932950 -1.004596283
## [1416] 1.073178004 2.847299388 1.152230849 -6.118356261 1.385116655
## [1421] -1.784493474 0.152559342 -6.291909372 3.098850251 -1.102784623
## [1426] 0.171064604 -10.002065332 -6.307069381 5.596350945 28.705837197
## [1431] 27.488697606 13.675500313 29.630668663 18.916077588 25.110794745
## [1436] 22.217742700 33.419508756 22.441471973 14.452063100 23.651415494
## [1441] 20.919316693 18.952500149 16.785501597 25.751180070 24.250113805
## [1446] 21.495841882 23.679295368 27.044896911 10.793797003 20.640993201
## [1451] 19.804766582 29.442193947 27.508214602 11.812265101 -6.498246952
## [1456] -13.639469243 3.183269188 -5.297274588 1.896608638 -6.757424069
## [1461] 7.228078799 -3.339758561 2.036821886 1.455701529 4.017551012
## [1466] -5.571004352 1.503480838 6.435459668 -9.287058951 2.293604028
## [1471] 7.299579487 2.639050643 -2.808630392
```

Plot the results in a graph where the x-axis is the different values of k and the y-axis is the accuracy of the model.

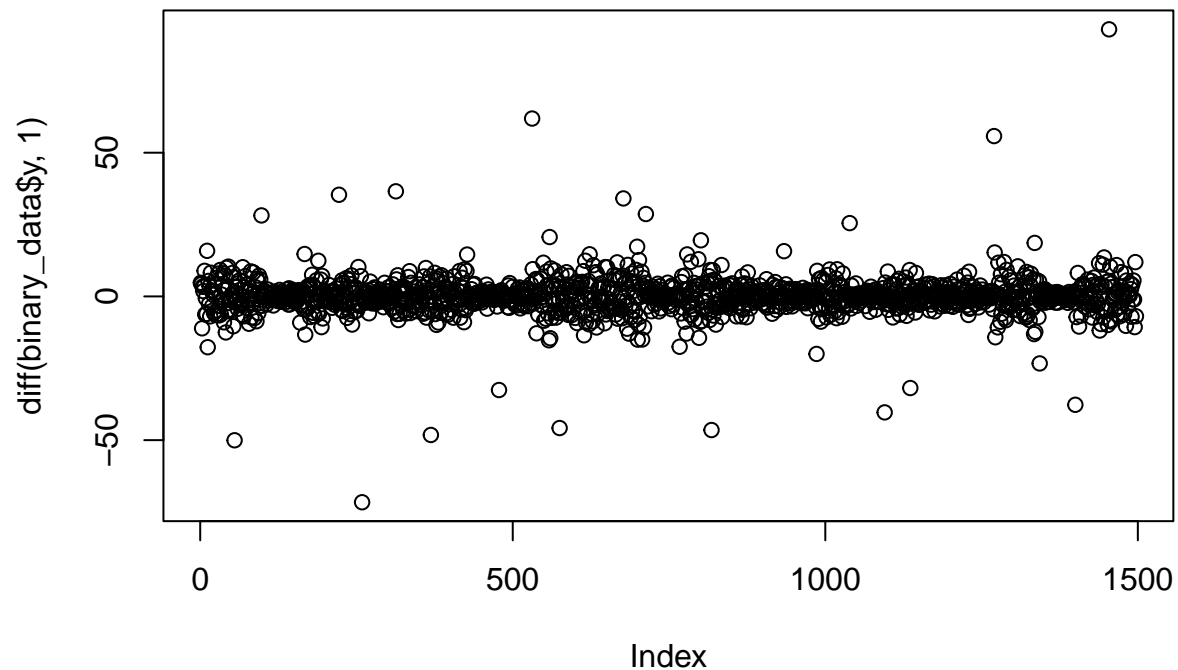
```
#install.packages('forecast')
library(forecast)
```

```
## Registered S3 method overwritten by 'quantmod':
##   method      from
##   as.zoo.data.frame zoo
```

```
ndiffs(x = binary_data$y)
```

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

```
plot(diff(binary_data$y, 1))
```



Looking back at the plots of the data, do you think a linear classifier would work well on these datasets?

Looking at the following plot I do think a linear classifier would work great with this set of data! At 0 a clear divider could be placed.

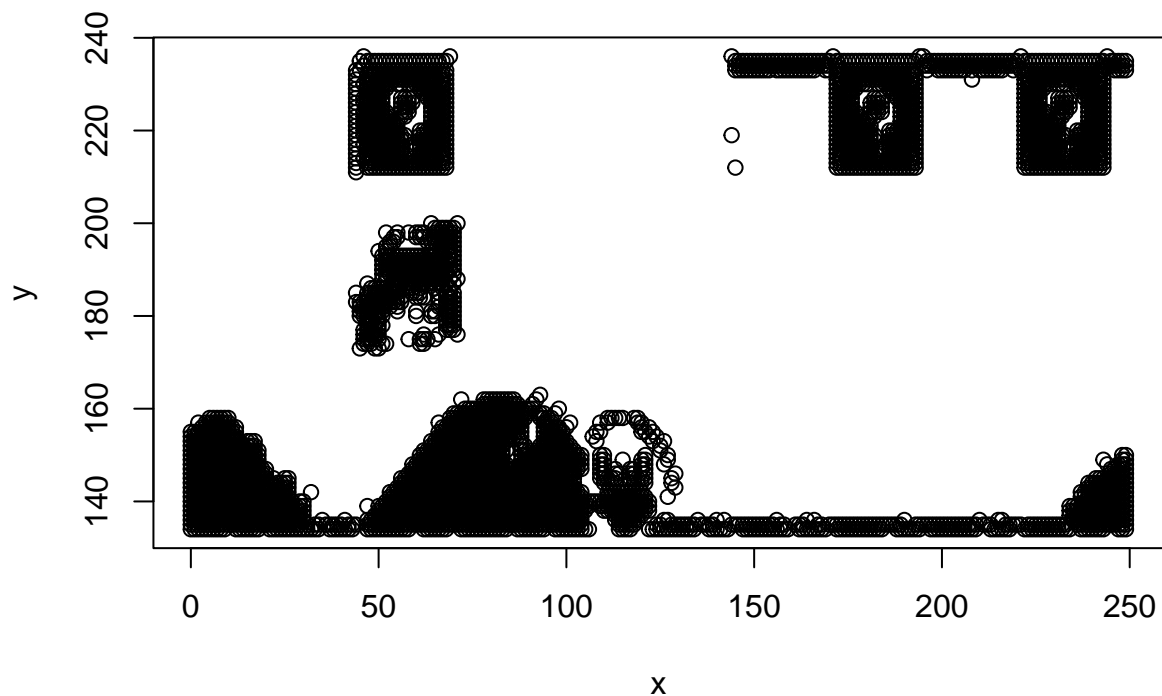
Download clustering data:

```
clustering_data <- read.csv(file = "clustering-data.csv")
head(clustering_data)
```

```
##      x  y
## 1  46 236
## 2  69 236
## 3 144 236
## 4 171 236
## 5 194 236
## 6 195 236
```

Plot the dataset using a scatter plot.

```
plot(y ~ x, data = clustering_data)
```



Fit the dataset using the k-means algorithm from k=2 to k=12.

```
clusterK2 <- kmeans(x=clustering_data, centers = 10)
clusterK2
```

```
## K-means clustering with 10 clusters of sizes 196, 555, 373, 600, 107, 760, 216, 518, 467, 230
##
## Cluster means:
##      x      y
## 1 23.489796 138.3980
## 2 66.227027 145.2090
## 3  7.597855 145.7936
## 4 89.816667 146.4567
## 5 179.355140 134.5514
## 6  57.410526 208.2447
## 7 239.287037 139.0648
## 8 179.550193 225.2664
## 9 231.089936 224.3683
```



```

## 10 118.765217 141.4783
##
## Clustering vector:
## [1] 6 6 8 8 8 8 9 9 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [25] 6 6 6 6 6 6 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
## [49] 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
## [73] 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9
## [97] 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
## [121] 9 9 9 9 9 9 9 9 9 9 9 6 8 8 8 8 8 8 8 8 8 8 8 8
## [145] 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
## [169] 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
## [193] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 8
## [217] 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
## [241] 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
## [265] 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
## [289] 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 6 6 6 6 6 6 6
## [313] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 8 8 8 8 8 8 8
## [337] 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9
## [361] 9 9 9 9 9 9 9 9 9 9 9 9 9 6 6 6 6 6 6 6 6 6 6 6
## [385] 6 6 6 6 6 6 6 6 6 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8
## [409] 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
## [433] 9 9 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [457] 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9
## [481] 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 6 6 6 6 6 6 6 6 6
## [505] 6 6 6 6 6 6 8 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9
## [529] 9 9 9 9 9 9 9 9 9 9 6 6 6 6 6 6 6 6 6 6 6 6 6 8
## [553] 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 6 6
## [577] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 8 8 8 8 8 8 8 8
## [601] 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 6 6 6 6
## [625] 6 6 6 6 6 6 6 6 6 6 6 6 6 8 8 8 8 8 8 8 8 8 8 8
## [649] 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 6 6 6 6 6 6 6
## [673] 6 6 6 6 6 6 8 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9
## [697] 9 9 9 9 9 9 9 9 9 9 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [721] 6 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9
## [745] 9 9 9 9 9 9 9 9 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [769] 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9
## [793] 9 9 9 9 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 8 8 8 8 8
## [817] 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9
## [841] 9 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 8 8 8 8 8 8 8
## [865] 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 6 6
## [889] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 8 8 8 8 8 8
## [913] 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9
## [937] 9 9 9 9 9 9 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [961] 6 6 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 9 9
## [985] 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 6 6 6 6 6 6
## [1009] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 8 8 8 8 8 8 8 8
## [1033] 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9
## [1057] 9 9 9 9 9 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1081] 6 6 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9
## [1105] 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 6 6 6 6 6 6
## [1129] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 8 8 8 8 8 8 8 8 8
## [1153] 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9
## [1177] 9 9 9 9 9 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1201] 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9

```

```

## [1225] 9 9 9 9 9 9 9 9 9 9 9 9 9 9 6 6 6 6 6 6 6 6 6 6 6 6
## [1249] 6 6 6 6 6 6 6 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
## [1273] 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 6 6 6 6 6 6
## [1297] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 8 8 8 8 8 8 8
## [1321] 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9
## [1345] 9 9 9 9 9 9 9 9 9 9 9 9 9 9 6 6 6 6 6 6 6 6 6 6 6
## [1369] 6 6 6 6 6 6 6 6 6 6 6 6 6 8 8 8 8 8 8 8 8 8 8 8 8
## [1393] 8 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9
## [1417] 9 9 9 9 9 9 9 9 9 9 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1441] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1465] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1489] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1513] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1537] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1561] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1585] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1609] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1633] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1657] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1681] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1705] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [1729] 6 6 6 6 6 6 6 6 6 2 2 2 6 6 6 6 6 6 2 2 2 6 6 6 2
## [1753] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 4 2 4 4 4 4 4 4
## [1777] 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 2 2 2 2 2 4 4 4 4
## [1801] 4 4 4 4 4 4 4 4 4 4 4 2 2 2 2 2 2 2 2 4 4 4 4
## [1825] 4 4 4 4 4 4 4 4 4 4 4 4 3 3 3 3 3 3 2 2 2 2 2 2
## [1849] 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 10 10 10 10 10
## [1873] 10 3 3 3 3 3 3 3 3 3 2 2 2 2 2 2 2 2 2 4 4 4 4
## [1897] 4 4 4 4 4 4 4 4 4 4 4 10 10 10 10 3 3 3 3 3 3 3 3
## [1921] 2 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4
## [1945] 4 4 4 4 10 10 3 3 3 3 3 3 3 3 3 3 3 3 2 2 2 2 2
## [1969] 2 2 2 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
## [1993] 10 10 10 10 10 3 3 3 3 3 3 3 3 3 3 3 3 2 2 2 2 2
## [2017] 2 2 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 10
## [2041] 10 10 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 2 2 2 2 2
## [2065] 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4
## [2089] 10 10 10 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 2 2 2 2
## [2113] 2 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4
## [2137] 4 4 4 4 10 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
## [2161] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4 4 4
## [2185] 4 4 4 4 4 4 4 4 4 4 4 4 4 10 3 3 3 3 3 3 3 3 3
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## [2281] 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4
## [2305] 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 10 10 10 10 10
## [2329] 7 7 7 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 2 2 2
## [2353] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4 4 4
## [2377] 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 10 10 10 10 10 7
## [2401] 7 7 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1 1 1 2
## [2425] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4
## [2449] 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 10 10 10
## [2473] 10 10 10 10 7 7 7 7 7 3 3 3 3 3 3 3 3 3 3 3 3
## [2497] 3 3 3 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

```

```

## [2521] 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
## [2545] 4 4 4 10 10 10 10 10 10 10 10 7 7 7 7 7 3 3 3 3 3 3 3 3
## [2569] 3 3 3 3 3 3 3 3 3 3 1 1 1 1 1 1 2 2 2 2 2 2 2 2
## [2593] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4 4 4 4
## [2617] 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 10 10 10 10 10 10 10
## [2641] 10 10 7 7 7 7 7 7 7 7 7 3 3 3 3 3 3 3 3 3 3 3 3
## [2665] 3 3 3 3 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2
## [2689] 2 2 2 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4
## [2713] 4 4 4 4 4 4 4 4 4 4 4 4 4 10 10 10 10 10 10 10 10 7 7
## [2737] 7 7 7 7 7 7 7 7 7 7 3 3 3 3 3 3 3 3 3 3 3 3 3
## [2761] 3 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2
## [2785] 2 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4
## [2809] 4 4 4 4 4 4 4 4 4 4 4 4 10 7 7 7 7 7 7 7 7 7 7
## [2833] 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1 1 1 1 1 1 1
## [2857] 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
## [2881] 2 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
## [2905] 4 4 4 4 4 4 10 10 10 10 10 10 10 10 10 10 7 7 7 7 7 7
## [2929] 7 7 7 7 7 7 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
## [2953] 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2
## [2977] 2 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4
## [3001] 4 4 4 4 4 4 4 4 4 4 4 4 10 10 10 10 10 10 10 10 10 10
## [3025] 10 7 7 7 7 7 7 7 7 7 7 7 7 7 7 3 3 3 3 3 3 3 3
## [3049] 3 3 3 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 2
## [3073] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 4
## [3097] 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
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## [3145] 7 7 7 7 7 7 7 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1
## [3169] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2
## [3193] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 4 4 4 4
## [3217] 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 10 10
## [3241] 10 10 10 10 10 10 10 10 10 10 10 10 10 10 7 7 7 7 7 7 7 7
## [3265] 7 7 7 7 7 7 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1 1 1
## [3289] 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2
## [3313] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4 4
## [3337] 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 10 10 10 10
## [3361] 10 10 10 10 10 10 10 10 10 10 7 7 7 7 7 7 7 7 7 7 7 7
## [3385] 7 7 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1 1 1 1 1 1 1
## [3409] 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2
## [3433] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4 4 4
## [3457] 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 10 10 10 10 10 10
## [3481] 10 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 3 3 3 3 3 3 3
## [3505] 3 3 3 3 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
## [3529] 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
## [3553] 2 2 2 2 2 2 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4
## [3577] 4 4 4 4 4 4 4 4 4 4 4 10 10 10 10 10 10 10 10 10 10
## [3601] 5 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 3 3 3
## [3625] 3 3 3 3 3 3 3 3 3 3 3 3 1 1 1 1 1 1 1 1 1 1 1
## [3649] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2
## [3673] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 4
## [3697] 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 10
## [3721] 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
## [3745] 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
## [3769] 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
## [3793] 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7

```

```
## [3817] 7 7 7 7 7 7 7 7 7 7 7 7 7 3 3 3 3 3 3 3 3 3 1 1
## [3841] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
## [3865] 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
## [3889] 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
## [3913] 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
## [3937] 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
## [3961] 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
## [3985] 5 5 5 5 5 5 5 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7
## [4009] 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
##
## Within cluster sum of squares by cluster:
## [1] 11925.94 82293.15 24216.78 69902.71 34946.97 308528.39 22577.30
## [8] 112959.43 65846.87 32840.71
## (between_SS / total_SS = 97.3 %)
##
## Available components:
##
## [1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss"
## [6] "betweenss"    "size"         "iter"         "ifault"
```

Create a scatter plot of the resultant clusters for each value of k.

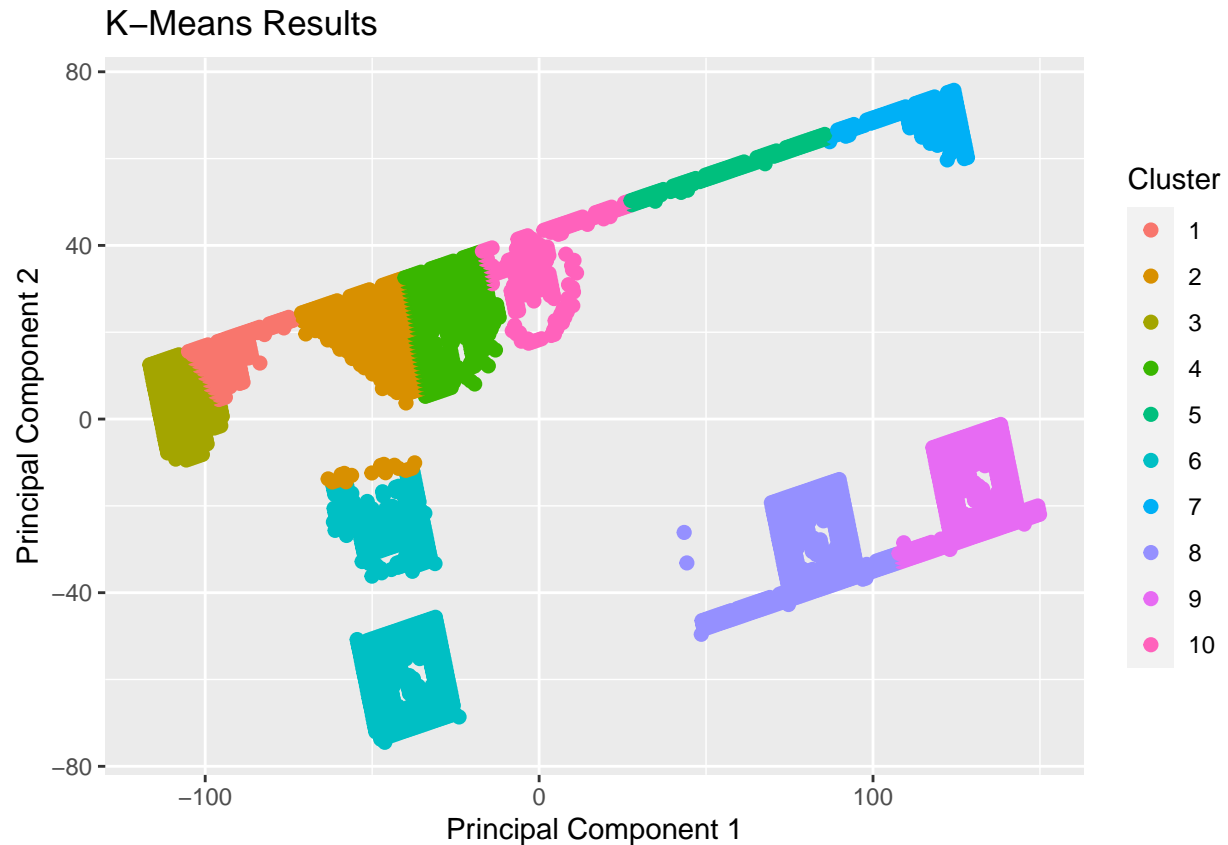
```
library(useful)
```

```
## Loading required package: ggplot2
```

```
## Registered S3 methods overwritten by 'useful':
```

```
##   method      from
##   autoplot.acf forecast
##   fortify.ts   forecast
```

```
plot(clusterK2, data = clustering_data)
```



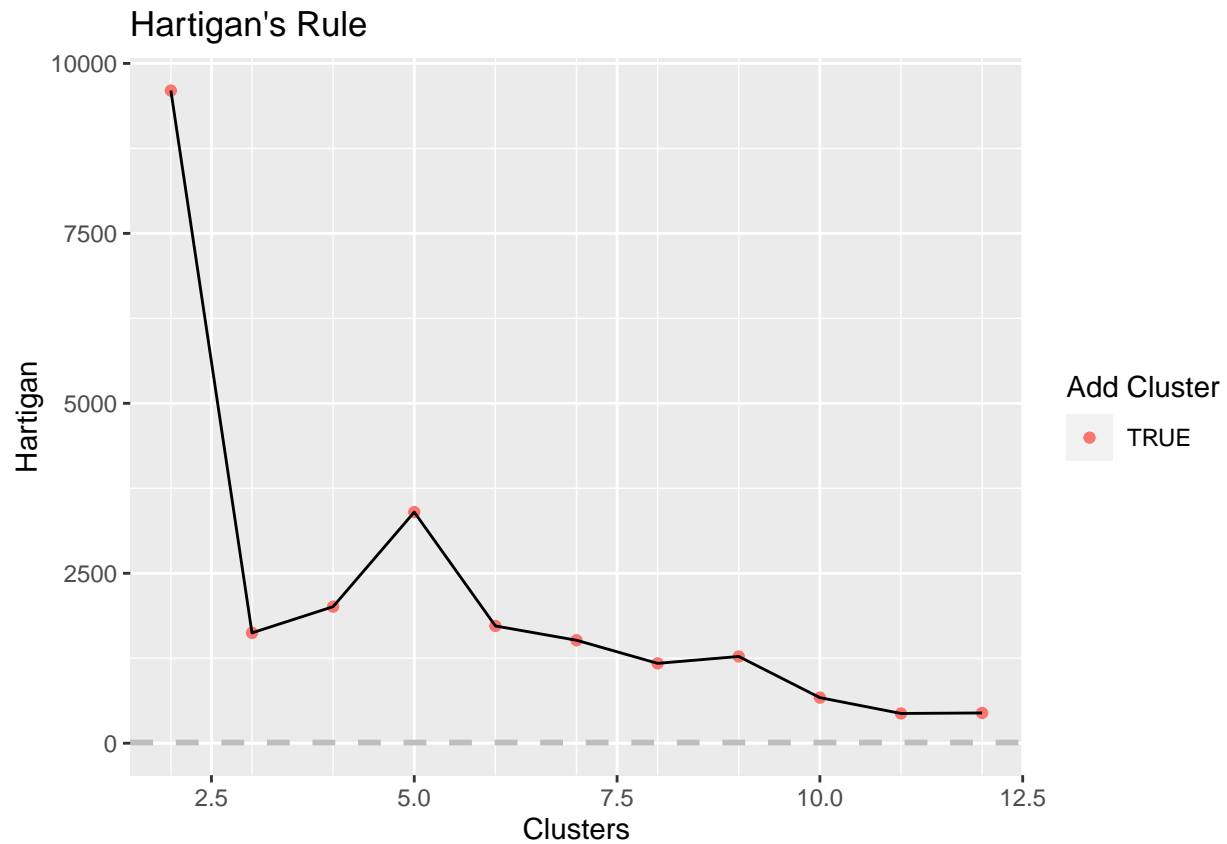
Instead, you will use the average distance from the center of each cluster as a measure of how well the model fits the data. To calculate this metric, simply compute the distance of each data point to the center of the cluster it is assigned to and take the average value of all of those distances.

```
cluster_best <- FitKMeans(clustering_data, max.clusters = 12, nstart = 25, seed = 278613)
cluster_best
```

##	Clusters	Hartigan	AddCluster
## 1	2	9600.6138	TRUE
## 2	3	1623.3382	TRUE
## 3	4	2008.8600	TRUE
## 4	5	3400.0118	TRUE
## 5	6	1725.2430	TRUE
## 6	7	1515.0802	TRUE
## 7	8	1174.8501	TRUE
## 8	9	1275.9895	TRUE
## 9	10	670.5540	TRUE
## 10	11	437.9165	TRUE
## 11	12	445.2956	TRUE

Calculate this average distance from the center of each cluster for each value of k and plot it as a line chart where k is the x-axis and the average distance is the y-axis.

```
PlotHartigan(cluster_best)
```



One way of determining the “right” number of clusters is to look at the graph of k versus average distance and finding the “elbow point”. Looking at the graph you generated in the previous example, what is the elbow point for this dataset?

Based on the graph above I would say the elbow point is perfect at 6 clusters.