



Міністерство освіти і науки України

Національний технічний університет України

«Київський політехнічний інститут імені Ігоря Сікорського»

Фізико-технічний інститут

ЛАБОРАТОРНА РОБОТА №1

З предмету «Криптографія»

на тему: «Експериментальна оцінка ентропії на символ
джерела відкритого тексту»

Виконала:

студентка 3 курсу ФТІ
групи ФБ-84
Даневич А.С.

Перевірив:

Чорний О.М.

Мета роботи

Засвоєння понять ентропії на символ джерела та його надлишковості, вивчення та порівняння різних моделей джерела відкритого тексту для наближеного визначення ентропії, набуття практичних навичок щодо оцінки ентропії на символ джерела.

Порядок виконання роботи

0. Уважно прочитати методичні вказівки до виконання комп'ютерного практикуму.
1. Написати програми для підрахунку частот букв і частот біграм в тексті, а також підрахунку H_1 та H_2 за безпосереднім означенням. Підрахувати частоти букв та біграм, а також значення H_1 та H_2 на довільно обраному тексті російською мовою достатньої довжини (щонайменше 1Мб), де імовірності замінити відповідними частотами. Також одержати значення H_1 та H_2 на тому ж тексті, в якому вилучено всі пробіли.
2. За допомогою програми CoolPinkProgram оцінити значення $(10) H$, $(20) H$, $(30) H$. 3. Використовуючи отримані значення ентропії, оцінити надлишковість російської мови в різних моделях джерела.

Хід роботи:

Частота монограм:

З пропусками:	Без пропусків:
"ё" - 8.36297e-05	"ё" - 9.99261e-05
"а" - 0.0656589	"а" - 0.0784534
"б" - 0.0158156	"б" - 0.0188974
"в" - 0.0388247	"в" - 0.0463902
"г" - 0.014682	"г" - 0.017543
"д" - 0.0259652	"д" - 0.0310249
"е" - 0.071538	"е" - 0.0854781
"ж" - 0.00919927	"ж" - 0.0109919
"з" - 0.0141252	"з" - 0.0168777
"и" - 0.0574177	"и" - 0.0686064
"й" - 0.00898656	"й" - 0.0107377
"к" - 0.0343091	"к" - 0.0409947
"л" - 0.0378979	"л" - 0.0452828
"м" - 0.0251203	"м" - 0.0300153
"н" - 0.0525181	"н" - 0.062752
"о" - 0.0947634	"о" - 0.113229
"п" - 0.0236781	"п" - 0.0282921
"р" - 0.0352599	"р" - 0.0421308
"с" - 0.0419426	"с" - 0.0501157
"т" - 0.0502197	"т" - 0.0600056
"у" - 0.0248358	"у" - 0.0296753
"ф" - 0.00102583	"ф" - 0.00122572
"х" - 0.0079921	"х" - 0.00954946
"ц" - 0.00291113	"ц" - 0.00347841
"ч" - 0.0157115	"ч" - 0.0187731
"ш" - 0.00817299	"ш" - 0.00976561
"щ" - 0.00246208	"щ" - 0.00294185
"ъ" - 0.000254071	"ъ" - 0.00030358
"ы" - 0.0157542	"ы" - 0.0188241
"ь" - 0.0166455	"ь" - 0.0198891
"э" - 0.00185349	"э" - 0.00221467
"ю" - 0.00529913	"ю" - 0.00633173
"я" - 0.0159919	"я" - 0.0191082
" " - 0.163084	

Частота біграм з перетином:

З пропусками:

" а" - 0.00223528	" ъ" - 3.63608e-06	"ан" - 0.00354109	"бл" - 0.000794483	"ви" - 0.00304658
" б" - 0.00732988	" э" - 0.00179986	"ао" - 6.81765e-06	"бм" - 2.09074e-05	"вк" - 0.000250435
" в" - 0.0152897	" ю" - 3.90878e-05	"ап" - 0.000865386	"бн" - 0.000284069	"вл" - 0.00057041
" г" - 0.00411468	" я" - 0.00144807	"ар" - 0.00248071	"бо" - 0.00201121	"вм" - 0.000135898
" д" - 0.00812345	" ё" - 5.99953e-05	"ас" - 0.00310385	"бр" - 0.0015217	"вн" - 0.00119309
" е" - 0.00344882	" ёр" - 1.81804e-06	"ат" - 0.00453146	"бс" - 0.000131353	"во" - 0.00641222
" ж" - 0.0020153	" ём" - 1.81804e-06	"ау" - 6.77219e-05	"бт" - 1.49988e-05	"вп" - 0.000255889
" з" - 0.00430784	" ён" - 1.81804e-06	"аф" - 6.09043e-05	"бу" - 0.00141898	"вр" - 0.000618588
" и" - 0.010236	" ёр" - 7.27216e-06	"ах" - 0.000999921	"бх" - 4.22694e-05	"вс" - 0.00298567
" й" - 1.36353e-06	" ёс" - 1.81804e-06	"ац" - 5.49957e-05	"бц" - 5.45412e-06	"вт" - 0.000184985
" к" - 0.00965606	" ёт" - 7.27216e-06	"ач" - 0.000782211	"бч" - 1.22718e-05	"ву" - 0.000606316
" л" - 0.00243526	" ёх" - 1.81804e-06	"аш" - 0.00076903	"бш" - 2.04529e-05	"вх" - 2.09074e-05
" м" - 0.00520005	" а" - 0.0153156	"ащ" - 0.000238618	"бщ" - 0.000138171	"вц" - 3.49972e-05
" н" - 0.0168778	" аё" - 7.27216e-06	"аэ" - 9.09019e-07	"бъ" - 7.45396e-05	"вч" - 7.2267e-05
" о" - 0.0094788	" аб" - 0.000607679	"аю" - 0.000768576	"бы" - 0.00388651	"вш" - 0.00132717
" п" - 0.0172023	" ав" - 0.00303749	"ая" - 0.00173214	"бь" - 4.40874e-05	"вщ" - 3.63608e-06
" р" - 0.0036029	" ар" - 0.000621315	" б" - 0.000261343	"бю" - 1.27263e-05	"въ" - 1.68169e-05
" с" - 0.0150834	" ад" - 0.00166032	" ба" - 0.00150988	"бя" - 0.000519959	"вы" - 0.00274069
" т" - 0.00885976	" ае" - 0.00128217	"бв" - 4.13604e-05	" в" - 0.00656857	"вь" - 0.000186349
" у" - 0.00407786	" аж" - 0.00142534	"бг" - 7.72667e-06	"ва" - 0.00516187	"вю" - 1.81804e-06
" ф" - 0.000563138	" аз" - 0.00368789	"бд" - 2.4089e-05	"вб" - 7.72667e-06	"вя" - 0.000286341
" х" - 0.00169714	" ай" - 8.40843e-05	" бе" - 0.002263	"вв" - 4.49965e-05	" г" - 0.000641768
" ц" - 0.000291341	" ай" - 0.000740396	"бж" - 1.59078e-05	"вр" - 4.22694e-05	"га" - 0.000776303
" ч" - 0.00680401	" ак" - 0.00680128	"бз" - 5.90863e-06	"вд" - 0.000325429	"гб" - 7.27216e-06
" ш" - 0.000694491	" ал" - 0.00683264	"би" - 0.000603134	"ве" - 0.0052964	"гв" - 1.54533e-05
" щ" - 0.00016726	" ам" - 0.00355108	"бк" - 0.000129081	"вз" - 0.00042633	"гр" - 4.5451e-07

"гд" - 0.000979468	"др" - 0.00146716	"ес" - 0.00445192	"зб" - 0.00019953	"ид" - 0.001209
"ге" - 0.000447238	"дс" - 0.000479508	"ет" - 0.00515096	"зв" - 0.000985832	"ие" - 0.00210893
"гж" - 4.5451e-07	"дт" - 0.000170896	"еу" - 0.00010181	"зг" - 0.000262252	"иж" - 0.00026907
"ги" - 0.00062995	"ду" - 0.00186349	"еф" - 8.18117e-06	"зд" - 0.00103855	"из" - 0.00206075
"гк" - 0.000108628	"дх" - 5.09051e-05	"ех" - 0.000690855	"зе" - 0.000386788	"ии" - 0.000356336
"гл" - 0.00115127	"дц" - 0.000225437	"ец" - 0.000580409	"ж" - 0.000154988	"ий" - 0.00128535
"гм" - 5.90863e-06	"дч" - 3.22702e-05	"еч" - 0.00112537	"зз" - 1.95439e-05	"ик" - 0.0030534
"гн" - 0.00024998	"дш" - 6.68129e-05	"еш" - 0.000884476	"зи" - 0.000344064	"ил" - 0.00474826
"го" - 0.00809755	"дъ" - 5.49957e-05	"ещ" - 0.000785847	"зк" - 9.99921e-05	"им" - 0.00266706
"гр" - 0.000734942	"ды" - 0.000452237	"ею" - 0.0002368	"зл" - 0.000189531	"ин" - 0.00317657
"гс" - 6.81765e-06	"дь" - 0.000875386	"ея" - 0.000113627	"зм" - 0.000178622	"ио" - 0.000156351
"гт" - 8.18117e-06	"дю" - 2.95431e-05	"ж " - 0.000637677	"зн" - 0.00169305	"ип" - 0.000254071
"гү" - 0.000794028	"дя" - 0.000325883	"жа" - 0.000965379	"зо" - 0.000543139	"ир" - 0.000612225
"гч" - 2.04529e-05	"е " - 0.0186981	"жб" - 6.59039e-05	"зп" - 4.09059e-06	"ис" - 0.00222119
"гш" - 5.90863e-06	"еа" - 2.72706e-05	"жг" - 4.5451e-07	"зр" - 0.000134535	"ит" - 0.00368107
"д " - 0.00108264	"еб" - 0.00150034	"жд" - 0.000730397	"зс" - 4.99961e-05	"иү" - 2.72706e-06
"да" - 0.00504642	"ев" - 0.00192303	"же" - 0.00404059	"зт" - 1.90894e-05	"иф" - 0.000171805
"дб" - 3.90878e-05	"ег" - 0.00293659	"жж" - 1.45443e-05	"зү" - 0.000239981	"их" - 0.0017535
"дв" - 0.000884476	"ед" - 0.00294068	"жи" - 0.00130535	"зц" - 9.5447e-06	"иц" - 0.000928109
"дг" - 3.63608e-06	"ее" - 0.00126717	"жк" - 0.000158624	"зч" - 3.77243e-05	"ич" - 0.00257571
"дд" - 2.77251e-05	"еж" - 0.00076494	"жл" - 1.95439e-05	"зш" - 9.99921e-06	"иш" - 0.000507687
"де" - 0.00455055	"ез" - 0.00113037	"жм" - 2.4089e-05	"зъ" - 4.99961e-05	"ищ" - 0.000165896
"дж" - 5.45412e-06	"еи" - 0.000132717	"жн" - 0.000892203	"зы" - 0.000384061	"иэ" - 2.72706e-06
"дз" - 9.09019e-06	"ей" - 0.00199075	"жо" - 3.95423e-05	"зь" - 0.000141353	"ию" - 0.000297249
"ди" - 0.00212801	"ек" - 0.00126763	"жр" - 1.81804e-06	"зю" - 4.09059e-06	"ия" - 0.00131126
"дк" - 0.000268161	"ел" - 0.00587454	"жс" - 2.59071e-05	"зя" - 0.000519959	"й " - 0.00725443
"дл" - 0.000569955	"ем" - 0.00392742	"жү" - 0.000192712	"и " - 0.0182781	"йб" - 4.09059e-06
"дм" - 0.000104537	"ен" - 0.00641904	"жч" - 3.63608e-05	"иа" - 2.2271e-05	"йд" - 0.000126354
"дн" - 0.00175032	"ео" - 0.00022271	"жъ" - 4.8178e-05	"иб" - 0.0008113	"йе" - 4.5451e-07
"до" - 0.00328429	"еп" - 0.000997194	"з " - 0.00124672	"ив" - 0.00219074	"йк" - 0.000280887
"дп" - 0.000116354	"ер" - 0.0053873	"за" - 0.00517823	"иг" - 0.000539049	"йл" - 2.04529e-05

"йм" - 8.68114e-05	"кю" - 4.5451e-07	"ма" - 0.00238981	"нж" - 4.99961e-06	"ой" - 0.00312703
"йн" - 0.000313612	"л " - 0.00651585	"мб" - 1.77259e-05	"нз" - 2.27255e-05	"ок" - 0.00206257
"йо" - 6.81765e-06	"лё" - 3.63608e-06	"мг" - 3.13612e-05	"ни" - 0.00741714	"ол" - 0.00563365
"йп" - 1.81804e-06	"ла" - 0.0048128	"ме" - 0.00371153	"нк" - 0.000400423	"ом" - 0.00506778
"йр" - 9.09019e-07	"лб" - 3.86333e-05	"мз" - 1.81804e-06	"нл" - 9.09019e-07	"он" - 0.00489825
"йс" - 0.000446329	"лв" - 7.77212e-05	"ми" - 0.00310566	"нн" - 0.00279569	"оо" - 0.000196803
"йт" - 0.00024589	"лг" - 0.000156351	"мк" - 9.49925e-05	"но" - 0.0095647	"оп" - 0.00122945
"йф" - 4.5451e-07	"лд" - 2.81796e-05	"мл" - 0.000154988	"нр" - 6.27223e-05	"ор" - 0.00586499
"йх" - 1.81804e-06	"ле" - 0.00355108	"мм" - 2.27255e-05	"нс" - 0.000348609	"ос" - 0.00563274
"йц" - 3.27247e-05	"лж" - 0.000298158	"мн" - 0.00129899	"нт" - 0.000271342	"от" - 0.00628723
"йч" - 4.68145e-05	"лз" - 4.5451e-06	"мо" - 0.00276206	"ну" - 0.00265206	"оу" - 7.45396e-05
"йш" - 0.0001159	"ли" - 0.00628405	"мп" - 4.04514e-05	"нф" - 2.04529e-05	"оф" - 8.86294e-05
"к " - 0.00521004	"лк" - 0.00037088	"мр" - 2.63616e-05	"нх" - 4.09059e-06	"ох" - 0.000531322
"ка" - 0.00883067	"лл" - 7.68121e-05	"мс" - 0.000114082	"нц" - 0.000322247	"оц" - 6.18133e-05
"кв" - 0.000160896	"лм" - 9.5447e-06	"мт" - 1.59078e-05	"нч" - 0.000183622	"оч" - 0.00201484
"кд" - 5.90863e-06	"лн" - 0.000201348	"му" - 0.00205393	"нш" - 5.90863e-06	"ош" - 0.001134
"ке" - 0.00074176	"ло" - 0.00579136	"мф" - 5.45412e-06	"нщ" - 5.63592e-05	"ощ" - 0.000156351
"кж" - 2.90886e-05	"лп" - 2.09074e-05	"мц" - 1.54533e-05	"ны" - 0.00334383	"оэ" - 3.63608e-05
"кз" - 1.36353e-06	"лс" - 0.00141852	"мч" - 2.36345e-05	"нъ" - 0.00134171	"ою" - 0.000907201
"ки" - 0.003482	"лт" - 7.90847e-05	"мш" - 3.63608e-06	"нью" - 0.000176804	"оя" - 0.000530413
"кк" - 8.18117e-06	"лу" - 0.00132035	"мщ" - 1.40898e-05	"ня" - 0.00104265	"п " - 5.09051e-05
"кл" - 0.000579045	"лф" - 1.68169e-05	"мы" - 0.000860841	"о " - 0.021626	"па" - 0.0012099
"кн" - 0.000525413	"лц" - 1.81804e-06	"мь" - 6.04498e-05	"оа" - 3.18157e-06	"пе" - 0.00217392
"ко" - 0.0102628	"лч" - 9.22655e-05	"мя" - 0.000444056	"об" - 0.00368971	"пи" - 0.000992649
"кр" - 0.00147943	"лш" - 4.5451e-07	"н " - 0.00346745	"ов" - 0.00837934	"пк" - 0.000161351
"кс" - 8.59023e-05	"лщ" - 5.45412e-06	"на" - 0.00919973	"ог" - 0.00424058	"пл" - 0.000666766
"кт" - 0.000471327	"лы" - 0.000581772	"нб" - 1.63623e-05	"од" - 0.00506142	"пн" - 0.000118173
"ку" - 0.0024139	"ль" - 0.00389015	"нв" - 1.31808e-05	"ое" - 0.00203257	"по" - 0.00963924
"кх" - 1.81804e-06	"лю" - 0.000888112	"нг" - 3.54518e-05	"ож" - 0.00187531	"пп" - 2.04529e-05
"кц" - 4.99961e-06	"ля" - 0.00136126	"нд" - 0.00016726	"оз" - 0.0015217	"пр" - 0.0072667
"кш" - 1.40898e-05	"м " - 0.00785029	"не" - 0.0095797	"ои" - 0.000797665	"пс" - 1.18173e-05

"пт" - 5.81772e-05	"py" - 0.00265116	"cy" - 0.000748123	"ty" - 0.00147579	"yt" - 0.00156579
"пy" - 0.000594953	"рф" - 4.95416e-05	"cf" - 4.09059e-06	"тф" - 5.90863e-06	"yy" - 9.09019e-07
"пx" - 1.81804e-06	"рx" - 0.000164533	"cx" - 0.000179077	"тx" - 1.72714e-05	"yf" - 9.99921e-06
"пц" - 5.72682e-05	"рц" - 2.77251e-05	"cц" - 1.86349e-05	"тц" - 7.49941e-05	"yx" - 0.000501779
"пч" - 6.77219e-05	"рч" - 6.13588e-05	"cч" - 0.000261343	"тч" - 0.000164078	"yc" - 2.72706e-06
"пш" - 1.49988e-05	"рш" - 0.000417694	"сш" - 6.72674e-05	"тш" - 1.54533e-05	"ych" - 0.000877204
"пщ" - 2.1362e-05	"рщ" - 1.68169e-05	"сб" - 3.81788e-05	"тщ" - 3.63608e-06	"yш" - 0.000927654
"пы" - 0.000189531	"ры" - 0.00129581	"сы" - 0.000300431	"ты" - 1.40898e-05	"yц" - 0.00019453
"пь" - 6.45404e-05	"рь" - 0.000541321	"сб" - 0.0026957	"ты" - 0.00151034	"yэ" - 9.09019e-06
"пю" - 9.09019e-07	"рю" - 0.00016726	"сэ" - 4.5451e-07	"ты" - 0.00590499	"yю" - 0.00109582
"пя" - 0.000294977	"ря" - 0.000929018	"сю" - 0.000172259	"тэ" - 1.81804e-06	"ya" - 3.86333e-05
"р " - 0.000754032	"с " - 0.00264343	"ся" - 0.0039256	"тю" - 0.000111809	"ф " - 1.18173e-05
"рө" - 5.45412e-06	"сө" - 6.18133e-05	"т " - 0.00558683	"тя" - 0.000524959	"фа" - 0.0002368
"pa" - 0.00624905	"ca" - 0.00172214	"тө" - 3.63608e-06	"y " - 0.0064404	"фе" - 0.000227255
"рб" - 8.54478e-05	"сб" - 5.90863e-05	"та" - 0.00544775	"ya" - 2.09074e-05	"фи" - 0.000188622
"рв" - 0.000232254	"св" - 0.00128808	"тб" - 1.09082e-05	"yb" - 0.000796301	"фл" - 1.95439e-05
"pr" - 0.000175441	"cr" - 1.63623e-05	"тв" - 0.00213529	"yb" - 0.00070449	"фм" - 4.09059e-06
"рд" - 0.000277705	"cd" - 0.000274069	"тр" - 7.72667e-06	"yr" - 0.0012199	"фн" - 1.81804e-06
"ре" - 0.00556911	"ce" - 0.00386288	"тд" - 0.000124081	"yd" - 0.00191939	"фо" - 8.40843e-05
"рж" - 0.000233618	"cj" - 9.09019e-06	"те" - 0.00523504	"ye" - 0.00024998	"фр" - 0.000150443
"рз" - 2.18165e-05	"сз" - 1.77259e-05	"тз" - 2.99976e-05	"yж" - 0.00188531	"фс" - 4.5451e-06
"ри" - 0.00492598	"ci" - 0.00135217	"ти" - 0.00307476	"yз" - 0.000389969	"фт" - 1.99984e-05
"рк" - 0.000447692	"ck" - 0.00370425	"тк" - 0.000544503	"yi" - 4.99961e-06	"фy" - 3.31792e-05
"рл" - 0.000106355	"cl" - 0.00268024	"тл" - 0.000170896	"yi" - 0.000146352	"фф" - 1.81804e-06
"рм" - 0.000160896	"cm" - 0.000713126	"тм" - 5.95408e-05	"yk" - 0.000799483	"фч" - 3.63608e-06
"рн" - 0.00077903	"cn" - 0.000762213	"тн" - 0.00128854	"yl" - 0.00106992	"фы" - 1.04537e-05
"ро" - 0.00774894	"co" - 0.0025548	"то" - 0.0129426	"ym" - 0.00109946	"фь" - 2.18165e-05
"рп" - 9.5447e-05	"cp" - 0.00131035	"тп" - 0.000118627	"yn" - 0.000191349	"фю" - 4.5451e-07
"pp" - 1.59078e-05	"cr" - 0.000137716	"тр" - 0.00239027	"yp" - 0.000871295	"фя" - 5.45412e-06
"pc" - 0.00028725	"cc" - 0.000607679	"тс" - 0.00115582	"yr" - 0.000628132	"х " - 0.00388879
"рт" - 0.000766303	"ct" - 0.00975423	"тт" - 6.77219e-05	"yc" - 0.001174	"ха" - 0.000634496

"хв" - 0.000198166	"че" - 0.00342882	"ще" - 0.0012599	"ыц" - 8.18117e-06	"эд" - 4.5451e-05
"хе" - 0.00010181	"чи" - 0.00345246	"щи" - 0.000732215	"ыч" - 0.000119536	"эз" - 9.09019e-07
"хи" - 0.000197257	"чк" - 0.000554502	"цн" - 1.68169e-05	"ыш" - 0.000421785	"эй" - 2.4089e-05
"хл" - 0.000200893	"чл" - 1.45443e-05	"цo" - 2.27255e-06	"ыщ" - 2.72706e-05	"эк" - 0.000121809
"хм" - 2.09074e-05	"чн" - 0.000757668	"цp" - 4.5451e-06	"ыя" - 4.5451e-07	"эл" - 1.22718e-05
"хн" - 0.000174986	"чо" - 0.000101356	"цy" - 9.49925e-05	"ь " - 0.0103283	"эм" - 2.63616e-05
"хо" - 0.00224164	"чp" - 5.49957e-05	"цб" - 1.81804e-05	"ьб" - 8.59023e-05	"эн" - 1.81804e-06
"хп" - 1.81804e-06	"чт" - 0.00372062	"ъ " - 7.27216e-06	"ьв" - 1.27263e-05	"эп" - 8.63568e-06
"хp" - 0.000101356	"чy" - 0.000742214	"ье" - 0.000130444	"ьг" - 5.86318e-05	"эр" - 4.5451e-07
"хс" - 5.40867e-05	"чш" - 0.00013408	"ью" - 5.45412e-06	"ьд" - 4.77235e-05	"эс" - 5.90863e-06
"хт" - 1.13627e-05	"чб" - 0.000194076	"ья" - 0.0001109	"ье" - 0.000529049	"эт" - 0.00152943
"хy" - 0.000145443	"чю" - 4.5451e-07	"ы " - 0.00441965	"ьж" - 5.45412e-06	"эф" - 7.27216e-06
"хш" - 1.45443e-05	"ш " - 0.000168623	"ьб" - 0.000138625	"ьз" - 0.000197257	"эх" - 5.68137e-05
"хъ" - 1.81804e-06	"ша" - 0.000970378	"ьв" - 0.000851751	"ьи" - 8.09027e-05	"ээ" - 4.5451e-07
"хэ" - 1.81804e-06	"шв" - 2.4998e-05	"ьг" - 0.000119536	"ьй" - 4.5451e-07	"ю " - 0.00331247
"хю" - 4.5451e-07	"ше" - 0.00194712	"ьд" - 9.90831e-05	"ьк" - 0.00143443	"юб" - 0.000272251
"хя" - 4.5451e-07	"ши" - 0.00220892	"ье" - 0.00131626	"ьм" - 0.000302249	"юг" - 5.90863e-06
"ц " - 0.000577227	"шк" - 0.000830389	"ьж" - 1.81804e-05	"ьн" - 0.00111673	"юд" - 0.000277251
"ца" - 0.000710853	"шл" - 0.000446329	"ьз" - 3.81788e-05	"ьо" - 1.09082e-05	"юж" - 2.81796e-05
"цв" - 6.8631e-05	"шм" - 4.09059e-06	"ьи" - 2.2271e-05	"ьп" - 4.5451e-07	"юз" - 5.45412e-06
"це" - 0.000716307	"шн" - 0.000258162	"ьй" - 0.00148397	"ьс" - 0.00098765	"юи" - 4.5451e-07
"ци" - 0.000145443	"шо" - 0.000345882	"ьк" - 0.000274524	"ьт" - 0.000153624	"юк" - 1.99984e-05
"цк" - 3.54518e-05	"шп" - 3.68153e-05	"ьл" - 0.00226437	"ьф" - 4.5451e-07	"юл" - 1.31808e-05
"цм" - 9.09019e-07	"шp" - 1.81804e-06	"ьм" - 0.00123263	"ьц" - 0.000129081	"юм" - 3.31792e-05
"цо" - 0.000252707	"шт" - 5.59047e-05	"ьн" - 0.00019953	"ьч" - 4.36329e-05	"юн" - 3.63608e-05
"цy" - 0.000207711	"шy" - 0.000254071	"ьп" - 0.00018044	"ьш" - 0.000394514	"юп" - 2.27255e-06
"цы" - 0.000195894	"шы" - 1.81804e-06	"ьp" - 0.000344064	"ьщ" - 3.18157e-06	"юр" - 7.40851e-05
"ч " - 0.000574955	"шь" - 0.000617224	"ьс" - 0.000545412	"ью" - 0.000260434	"юс" - 0.000145443
"чө" - 1.81804e-06	"шю" - 4.5451e-07	"ьт" - 0.000618588	"ья" - 0.000461782	"ют" - 0.000368607
"ча" - 0.00197666	"щ " - 1.22718e-05	"ьy" - 6.81765e-06	"э " - 5.90863e-06	"юф" - 1.09082e-05
"чв" - 2.27255e-06	"ца" - 0.000320884	"ьх" - 0.0010031	"эг" - 5.90863e-06	"юх" - 4.40874e-05

"юц" - 1.81804e-06	"яв" - 0.000261798	"яй" - 0.000186803	"яр" - 8.59023e-05	"ящ" - 0.00015726
"юч" - 0.000119082	"яг" - 7.86302e-05	"як" - 0.000369516	"яс" - 0.000375425	"яю" - 8.63568e-05
"юш" - 0.000187258	"яд" - 0.000452237	"ял" - 0.000580863	"ят" - 0.00152988	"яя" - 6.40859e-05
"ющ" - 0.00030634	"яе" - 8.13572e-05	"ям" - 0.0004586	"ях" - 0.000227255	
"юю" - 3.45427e-05	"яж" - 0.000145898	"ян" - 0.000702672	"яц" - 2.1362e-05	
"я " - 0.00958697	"яз" - 0.000224073	"яо" - 1.81804e-06	"яч" - 0.00013408	
"яб" - 3.18157e-05	"яи" - 8.54478e-05	"яп" - 4.36329e-05	"яш" - 1.77259e-05	

Без пропусків:

"ёб" - 2.17231e-06	"ав" - 0.00549594	"аш" - 0.00101555	"бт" - 3.31277e-05	"вк" - 0.00101284
"ёв" - 4.34462e-06	"аг" - 0.00119857	"ащ" - 0.000307925	"бү" - 0.00170798	"вл" - 0.000809728
"ёг" - 6.51693e-06	"ад" - 0.0028517	"аэ" - 0.000266651	"бх" - 5.05062e-05	"vm" - 0.000367663
"ёе" - 2.17231e-06	"ае" - 0.00198386	"аю" - 0.000925403	"бц" - 6.51693e-06	"вн" - 0.00207564
"ёз" - 4.34462e-06	"аж" - 0.00182474	"ая" - 0.00227875	"бч" - 1.46631e-05	"во" - 0.00811683
"ёи" - 1.08615e-05	"аз" - 0.00481927	"ба" - 0.00181279	"бш" - 2.44385e-05	"вп" - 0.00111494
"ёк" - 2.17231e-06	"аи" - 0.00121432	"бб" - 3.80154e-06	"бщ" - 0.000167268	"вр" - 0.00104271
"ём" - 4.34462e-06	"ай" - 0.000884673	"бв" - 8.63493e-05	"бъ" - 8.90647e-05	"вс" - 0.00443585
"ён" - 6.51693e-06	"ак" - 0.00935016	"бг" - 1.35769e-05	"бы" - 0.00464385	"вт" - 0.000807013
"ёо" - 2.17231e-06	"ал" - 0.00848721	"бд" - 3.58431e-05	"бь" - 5.26785e-05	"вү" - 0.000892276
"ёп" - 4.34462e-06	"ам" - 0.00482307	"бе" - 0.00271593	"бэ" - 5.91954e-05	"вф" - 1.79215e-05
"ёр" - 1.08615e-05	"ан" - 0.00603522	"бж" - 2.118e-05	"бю" - 1.52062e-05	"вх" - 0.000114046
"ёс" - 1.30339e-05	"ао" - 0.00100741	"бз" - 1.62923e-05	"бя" - 0.000632685	"вц" - 5.53939e-05
"ёт" - 8.68923e-06	"ап" - 0.002887	"би" - 0.00074293	"ва" - 0.00625027	"вч" - 0.000285116
"ёү" - 2.17231e-06	"ар" - 0.00330137	"бк" - 0.000161294	"вб" - 0.000240583	"вш" - 0.00164281
"ёф" - 4.34462e-06	"ас" - 0.00553559	"бл" - 0.000955816	"вв" - 0.000475193	"вщ" - 1.19477e-05
"ёх" - 2.17231e-06	"ат" - 0.00639147	"бм" - 2.60677e-05	"вр" - 0.000468676	"въ" - 2.00939e-05
"ёц" - 2.17231e-06	"ау" - 0.000555568	"бн" - 0.000364948	"вд" - 0.000872725	"вы" - 0.00327476
"ёч" - 6.51693e-06	"аф" - 0.000160208	"бо" - 0.00243081	"ве" - 0.0064599	"вь" - 0.000222662
"аё" - 8.68923e-06	"ах" - 0.00136258	"бп" - 1.52062e-05	"вж" - 7.49446e-05	"вэ" - 0.000192249
"аа" - 0.000265565	"ац" - 9.93831e-05	"бр" - 0.00182745	"вз" - 0.000659296	"вю" - 5.43077e-06
"аб" - 0.00146088	"ач" - 0.00165476	"бс" - 0.000169983	"ви" - 0.00398347	"вя" - 0.000387214

"га" - 0.000938437	"дж" - 1.19477e-05	"еж" - 0.00110462	"жи" - 0.00160425	"зп" - 0.000173785
"гб" - 2.49815e-05	"дз" - 7.44016e-05	"ез" - 0.00208324	"жк" - 0.000222662	"зр" - 0.000208542
"гв" - 0.000109702	"ди" - 0.00266053	"еи" - 0.0014044	"жл" - 2.66108e-05	"зс" - 0.000168897
"гг" - 1.19477e-05	"дк" - 0.0004236	"ей" - 0.00237868	"жм" - 7.06e-05	"зт" - 0.00011296
"гд" - 0.00124202	"дл" - 0.000710345	"ек" - 0.00258668	"жн" - 0.00118445	"зү" - 0.000344311
"ге" - 0.000552309	"дм" - 0.000158035	"ел" - 0.00745265	"жо" - 9.93831e-05	"зф" - 1.03185e-05
"гж" - 1.62923e-06	"дн" - 0.00225649	"ем" - 0.00565017	"жп" - 6.13677e-05	"зх" - 5.43077e-06
"гз" - 5.75662e-05	"до" - 0.0039889	"ен" - 0.00975638	"жр" - 1.19477e-05	"зц" - 1.62923e-05
"ги" - 0.000793436	"дп" - 0.000218317	"ео" - 0.00145816	"жс" - 7.60308e-05	"зч" - 0.000104271
"гк" - 0.000171069	"др" - 0.00179161	"еп" - 0.00378851	"жт" - 8.4177e-05	"зш" - 1.52062e-05
"гл" - 0.00137779	"дс" - 0.000699483	"ер" - 0.00695953	"жү" - 0.000239497	"зщ" - 5.43077e-07
"гм" - 1.90077e-05	"дт" - 0.000272082	"ес" - 0.00738096	"жф" - 2.17231e-06	"зъ" - 5.97385e-05
"гн" - 0.000371465	"дү" - 0.00225974	"ет" - 0.00730873	"жх" - 1.35769e-05	"зы" - 0.0004589
"го" - 0.00972597	"дф" - 5.43077e-07	"еү" - 0.000712517	"жч" - 5.48508e-05	"зь" - 0.000168897
"гп" - 9.884e-05	"дх" - 8.30908e-05	"еф" - 8.96077e-05	"жь" - 5.75662e-05	"зэ" - 3.42139e-05
"гр" - 0.000902594	"дц" - 0.000275883	"ех" - 0.00116327	"жэ" - 2.118e-05	"зю" - 4.88769e-06
"гс" - 0.000100469	"дч" - 7.98323e-05	"ец" - 0.00074293	"жя" - 2.17231e-05	"зя" - 0.000628883
"гт" - 3.31277e-05	"дш" - 8.74354e-05	"еч" - 0.00220326	"за" - 0.00619868	"иа" - 0.000276969
"гү" - 0.000956902	"дщ" - 2.17231e-06	"еш" - 0.0011296	"зб" - 0.000288917	"иб" - 0.00194096
"гф" - 5.43077e-07	"дъ" - 6.57123e-05	"ещ" - 0.000954187	"зв" - 0.00129795	"ив" - 0.00495721
"гх" - 1.08615e-06	"ды" - 0.000540362	"еэ" - 0.000242212	"зг" - 0.000361146	"иг" - 0.00119477
"гч" - 4.01877e-05	"дъ" - 0.00104597	"ею" - 0.000287831	"зд" - 0.00131696	"ид" - 0.00260188
"гш" - 7.06e-06	"дэ" - 1.35769e-05	"ея" - 0.00033182	"зе" - 0.000472477	"ие" - 0.0029728
"гэ" - 2.71539e-06	"дю" - 3.53e-05	"жа" - 0.00116001	"жз" - 0.000187905	"иж" - 0.000496916
"гя" - 2.17231e-06	"дя" - 0.00039536	"жб" - 0.000106986	"зз" - 8.52631e-05	"из" - 0.00305427
"да" - 0.00603793	"еа" - 0.000255246	"жв" - 5.70231e-05	"зи" - 0.000461616	"ии" - 0.00167105
"дб" - 8.4177e-05	"еб" - 0.00300593	"жг" - 3.25846e-06	"зк" - 0.000288374	"ий" - 0.00153637
"дв" - 0.00114426	"ев" - 0.00440001	"жд" - 0.000916714	"зл" - 0.000236782	"ик" - 0.00494852
"дг" - 6.08246e-05	"ег" - 0.0040204	"же" - 0.00484533	"зм" - 0.000259048	"ил" - 0.00599231
"дд" - 8.58062e-05	"ед" - 0.00471554	"жж" - 1.73785e-05	"зн" - 0.00218263	"им" - 0.00378959
"де" - 0.00546118	"ее" - 0.00191109	"жз" - 3.31277e-05	"зо" - 0.000723922	"ин" - 0.00601567

"ио" - 0.00150867	"йс" - 0.00142069	"кф" - 1.73785e-05	"лх" - 3.36708e-05	"мц" - 2.60677e-05
"ип" - 0.00297715	"йт" - 0.000674502	"кх" - 4.83339e-05	"лц" - 2.71539e-06	"мч" - 0.000474106
"ир" - 0.00118771	"йу" - 0.000219946	"кц" - 1.14046e-05	"лч" - 0.00072012	"мш" - 4.61616e-05
"ис" - 0.00459498	"йф" - 4.45323e-05	"кч" - 0.000333992	"лш" - 3.04123e-05	"мщ" - 2.824e-05
"ит" - 0.00551332	"йх" - 8.90647e-05	"кш" - 3.96446e-05	"лщ" - 1.412e-05	"мы" - 0.00102859
"иу" - 0.000553396	"йц" - 7.38585e-05	"кщ" - 7.06e-06	"лы" - 0.000695139	"мь" - 7.22293e-05
"иф" - 0.000282943	"йч" - 0.000425229	"кэ" - 4.56185e-05	"ль" - 0.0046482	"мэ" - 8.74354e-05
"их" - 0.00234664	"йш" - 0.000199852	"кю" - 1.08615e-06	"лэ" - 5.37646e-05	"мю" - 3.25846e-06
"иц" - 0.00115132	"йщ" - 1.412e-05	"кя" - 8.36339e-05	"лю" - 0.00106172	"мя" - 0.000602816
"ич" - 0.00383467	"йэ" - 6.19108e-05	"лё" - 4.34462e-06	"ля" - 0.00165204	"на" - 0.0110712
"иш" - 0.000719577	"йю" - 8.68923e-06	"ла" - 0.00591683	"ма" - 0.0029891	"нб" - 0.000270452
"ищ" - 0.000231894	"йя" - 8.20046e-05	"лб" - 0.000423057	"мб" - 0.000379611	"нв" - 0.00038124
"из" - 0.000178129	"ка" - 0.0106264	"лв" - 0.00076954	"мв" - 0.000808642	"нг" - 0.000129795
"ию" - 0.000357888	"кб" - 0.000401334	"лг" - 0.000364405	"мг" - 0.000313899	"нд" - 0.000357345
"ия" - 0.00171884	"кв" - 0.000746188	"лд" - 0.000290546	"мд" - 0.000595756	"не" - 0.0115246
"йа" - 0.000154234	"кг" - 0.000171612	"ле" - 0.00460584	"ме" - 0.00456836	"нж" - 2.49815e-05
"йб" - 0.000369292	"кд" - 0.00027534	"лж" - 0.000382326	"мж" - 0.000137942	"нз" - 0.000135226
"йв" - 0.000589782	"ке" - 0.000972108	"лз" - 0.000155863	"мз" - 0.000216688	"ни" - 0.00917312
"йг" - 0.000260677	"кж" - 0.000179215	"ли" - 0.00800224	"ми" - 0.00443531	"нк" - 0.00067233
"йд" - 0.000659296	"кз" - 0.00013414	"лй" - 5.43077e-07	"мк" - 0.000605531	"нл" - 4.12739e-05
"йе" - 0.000126537	"ки" - 0.00456402	"лк" - 0.000780402	"мл" - 0.000325846	"нм" - 0.000122735
"йж" - 0.000125451	"кк" - 0.000354629	"лл" - 0.000154234	"мм" - 0.000295977	"нн" - 0.00378308
"йз" - 0.000173242	"кл" - 0.00076954	"лм" - 0.000205283	"мн" - 0.00243679	"но" - 0.0116854
"йи" - 0.000607703	"км" - 0.00016944	"лн" - 0.00106715	"мо" - 0.00398347	"нп" - 0.000480623
"йк" - 0.000952557	"кн" - 0.001412	"ло" - 0.00773288	"мп" - 0.00103456	"нр" - 0.000171069
"йл" - 0.000153148	"ко" - 0.012538	"лп" - 0.00082765	"мр" - 0.000279142	"нс" - 0.000877613
"йм" - 0.000447496	"кп" - 0.000530586	"лр" - 0.000122735	"мс" - 0.000993288	"нт" - 0.000511036
"йн" - 0.00119043	"кр" - 0.00187742	"лс" - 0.00239008	"мт" - 0.000406765	"ну" - 0.0033106
"йо" - 0.000352457	"кс" - 0.000726094	"лт" - 0.000399705	"мү" - 0.00267248	"нф" - 2.76969e-05
"йп" - 0.000952557	"кт" - 0.000923774	"лү" - 0.00173676	"мф" - 3.42139e-05	"нх" - 6.40831e-05
"йр" - 0.000308468	"ку" - 0.00303472	"лф" - 3.85585e-05	"мх" - 0.000133054	"нц" - 0.000386128

"нч" - 0.000344854	"оч" - 0.00358377	"ра" - 0.0074836	"са" - 0.00209628	"тё" - 4.34462e-06
"нш" - 1.62923e-05	"ош" - 0.00143807	"рб" - 0.000130339	"сб" - 0.00020474	"та" - 0.00665052
"нщ" - 6.95139e-05	"ощ" - 0.000213429	"рв" - 0.000359517	"св" - 0.00176663	"тб" - 0.000349199
"ны" - 0.00399542	"оз" - 0.000266108	"рг" - 0.000230808	"сг" - 9.178e-05	"тв" - 0.00321013
"нь" - 0.00160316	"ою" - 0.00108833	"рд" - 0.000376352	"сд" - 0.000460529	"тг" - 0.000177586
"нэ" - 2.87831e-05	"оя" - 0.000878699	"ре" - 0.0066679	"се" - 0.00466015	"тд" - 0.000431746
"ню" - 0.000211257	"па" - 0.00144621	"рж" - 0.000281857	"сж" - 5.59369e-05	"те" - 0.0064284
"ня" - 0.00128112	"пв" - 4.34462e-06	"рз" - 6.19108e-05	"сз" - 8.30908e-05	"тж" - 0.000234609
"оа" - 0.000228635	"пг" - 2.71539e-06	"ри" - 0.00597005	"си" - 0.00170906	"тз" - 0.000202025
"об" - 0.00581201	"пд" - 9.23231e-06	"рк" - 0.000612048	"ск" - 0.00467644	"ти" - 0.00406602
"ов" - 0.0127232	"пе" - 0.00259808	"рл" - 0.000140114	"сл" - 0.00326824	"тй" - 5.43077e-07
"ог" - 0.00563008	"пи" - 0.00120074	"рм" - 0.0002118	"см" - 0.00095473	"тк" - 0.00102805
"од" - 0.00718763	"пк" - 0.000193879	"рн" - 0.000994917	"сн" - 0.00131533	"тл" - 0.000313356
"ое" - 0.00301951	"пл" - 0.000799953	"ро" - 0.00932192	"со" - 0.00320741	"тм" - 0.000265022
"ож" - 0.00287016	"пн" - 0.000144459	"рп" - 0.000210714	"сп" - 0.00185189	"тн" - 0.00221901
"оз" - 0.00261655	"по" - 0.011523	"рр" - 3.63862e-05	"ср" - 0.000243299	"то" - 0.0158188
"ои" - 0.00220489	"пп" - 2.87831e-05	"рс" - 0.000432289	"сс" - 0.0010237	"тп" - 0.000715776
"ой" - 0.00373637	"пр" - 0.00868272	"рт" - 0.000963962	"ст" - 0.0119738	"тр" - 0.00298258
"ок" - 0.0036359	"пс" - 1.90077e-05	"ру" - 0.00320035	"су" - 0.00100904	"тс" - 0.0018986
"ол" - 0.00708933	"пт" - 7.27723e-05	"рф" - 6.08246e-05	"сф" - 2.76969e-05	"тт" - 0.000490399
"ом" - 0.00686884	"пу" - 0.00071306	"рх" - 0.000199309	"сх" - 0.000249272	"ту" - 0.00197083
"он" - 0.00864905	"пх" - 2.17231e-06	"рц" - 3.31277e-05	"сц" - 3.04123e-05	"тф" - 2.17231e-05
"оо" - 0.0018041	"пц" - 6.95139e-05	"рч" - 0.000102642	"сч" - 0.000392645	"тх" - 7.7117e-05
"оп" - 0.00407199	"пч" - 8.09185e-05	"рш" - 0.000501803	"сш" - 9.93831e-05	"тц" - 9.8297e-05
"ор" - 0.00757375	"пш" - 1.79215e-05	"рщ" - 2.00939e-05	"сщ" - 4.88769e-06	"тч" - 0.000495829
"ос" - 0.00907753	"пщ" - 2.55246e-05	"ры" - 0.00154831	"сь" - 4.56185e-05	"тш" - 3.14985e-05
"от" - 0.00897272	"пы" - 0.000226463	"рь" - 0.000646805	"сы" - 0.000358974	"тщ" - 8.68923e-06
"оу" - 0.000786376	"пь" - 7.7117e-05	"рэ" - 4.88769e-06	"сь" - 0.00322099	"тъ" - 1.68354e-05
"оф" - 0.000184103	"пю" - 1.08615e-06	"рю" - 0.000199852	"сэ" - 3.85585e-05	"ты" - 0.00180465
"ох" - 0.000893905	"пя" - 0.000352457	"ря" - 0.00111983	"сю" - 0.000205826	"ть" - 0.00705566
"оц" - 0.000124365	"рё" - 6.51693e-06	"сё" - 7.38585e-05	"ся" - 0.00471554	"тэ" - 9.61247e-05

"тЮ" - 0.000133597	"үя" - 0.000122735	"хл" - 0.000386128	"цо" - 0.000348656	"чс" - 5.81093e-05
"тя" - 0.000708173	"фа" - 0.000282943	"хм" - 0.000204197	"цп" - 8.36339e-05	"чт" - 0.00448799
"уа" - 0.000165095	"фг" - 5.43077e-07	"хн" - 0.000608789	"цр" - 1.412e-05	"чу" - 0.000906939
"уб" - 0.00117631	"фе" - 0.000271539	"хо" - 0.00294239	"цс" - 7.60308e-05	"чф" - 1.08615e-06
"ув" - 0.00149563	"фз" - 1.08615e-06	"хп" - 0.000575119	"цт" - 3.09554e-05	"чх" - 8.68923e-06
"уг" - 0.00161674	"фи" - 0.000227549	"хр" - 0.000218317	"цү" - 0.000260677	"чч" - 2.49815e-05
"уд" - 0.00264641	"фк" - 1.08615e-06	"хс" - 0.000487683	"цф" - 2.17231e-06	"чш" - 0.000163466
"уе" - 0.000399162	"фл" - 2.55246e-05	"хт" - 0.000209628	"цх" - 2.17231e-06	"чъ" - 0.000231894
"уж" - 0.00238682	"фм" - 4.88769e-06	"хү" - 0.000284572	"цц" - 2.17231e-06	"чэ" - 6.51693e-06
"үз" - 0.000615306	"фн" - 2.17231e-06	"хф" - 1.08615e-05	"цч" - 2.28092e-05	"чю" - 5.43077e-07
"үи" - 0.000613134	"фо" - 0.000100469	"хх" - 3.63862e-05	"цы" - 0.000234066	"чя" - 8.68923e-06
"үй" - 0.000174871	"фр" - 0.000179759	"хц" - 1.30339e-05	"цэ" - 7.60308e-06	"ша" - 0.00117033
"үк" - 0.00142938	"фс" - 1.03185e-05	"хч" - 0.000146631	"цю" - 2.17231e-06	"шб" - 1.30339e-05
"үл" - 0.00133434	"фт" - 2.60677e-05	"хш" - 5.43077e-05	"ця" - 5.43077e-07	"шв" - 3.96446e-05
"үм" - 0.00160208	"фү" - 3.96446e-05	"хщ" - 6.51693e-06	"чё" - 2.17231e-06	"шг" - 7.06e-06
"үн" - 0.00125614	"фф" - 2.17231e-06	"хъ" - 2.17231e-06	"ча" - 0.00238519	"шд" - 1.412e-05
"уо" - 0.000358974	"фч" - 4.34462e-06	"хэ" - 4.01877e-05	"чб" - 8.68923e-06	"ше" - 0.00232654
"үп" - 0.00180899	"фы" - 1.24908e-05	"хю" - 2.71539e-06	"чв" - 6.19108e-05	"шж" - 2.17231e-06
"үр" - 0.000856433	"фъ" - 2.60677e-05	"хя" - 2.55246e-05	"чг" - 9.77539e-06	"шз" - 2.71539e-06
"үс" - 0.00213212	"фю" - 5.43077e-07	"ца" - 0.000863493	"чд" - 3.25846e-05	"ши" - 0.00265565
"үт" - 0.0023651	"фя" - 6.51693e-06	"цб" - 2.824e-05	"че" - 0.00410403	"шк" - 0.00100958
"үү" - 0.000107529	"ха" - 0.000835253	"цв" - 0.000146631	"чж" - 3.80154e-06	"шл" - 0.000533845
"үф" - 4.56185e-05	"хб" - 0.000226463	"цг" - 1.73785e-05	"чз" - 1.46631e-05	"шм" - 1.19477e-05
"үх" - 0.000670157	"хв" - 0.000588696	"цд" - 2.93262e-05	"чи" - 0.00418495	"шн" - 0.000323674
"үц" - 1.08615e-05	"хг" - 0.000137942	"це" - 0.000864036	"чк" - 0.000702742	"шо" - 0.000427945
"үч" - 0.00150161	"хд" - 0.000279142	"цз" - 2.87831e-05	"чл" - 2.06369e-05	"шп" - 7.0057e-05
"үш" - 0.00113177	"хе" - 0.000186275	"ци" - 0.000229722	"чм" - 1.24908e-05	"шр" - 2.71539e-06
"үщ" - 0.000238411	"хж" - 3.63862e-05	"цк" - 7.98323e-05	"чн" - 0.000979711	"шс" - 1.19477e-05
"үъ" - 4.34462e-06	"хз" - 0.000108072	"цл" - 2.17231e-06	"чо" - 0.000173785	"шт" - 7.87462e-05
"үэ" - 9.77539e-05	"хи" - 0.000599014	"цм" - 3.85585e-05	"чп" - 0.000103728	"шу" - 0.000314442
"үю" - 0.00131153	"хк" - 0.000297063	"цн" - 6.24539e-05	"чр" - 7.33154e-05	"шх" - 4.34462e-06

"шч" - 2.71539e-06	"ый" - 0.00177315	"ьл" - 0.00018356	"эф" - 8.68923e-06	"яа" - 0.00016238
"шы" - 2.17231e-06	"ык" - 0.000633771	"ьм" - 0.000701113	"эх" - 6.78846e-05	"яб" - 0.000513751
"шь" - 0.000737499	"ыл" - 0.00276426	"ьн" - 0.00259699	"ээ" - 4.88769e-06	"яв" - 0.00155537
"шю" - 5.43077e-07	"ым" - 0.00168245	"ьо" - 0.000745102	"юа" - 7.7117e-05	"яг" - 0.000351371
"шя" - 2.17231e-06	"ын" - 0.000879785	"ьп" - 0.00116273	"юб" - 0.000463245	"яд" - 0.00114589
"ща" - 0.000383412	"ьо" - 0.000280771	"ьр" - 0.000259048	"юв" - 0.000278599	"яе" - 0.000341052
"щв" - 5.43077e-07	"ып" - 0.000736956	"ьс" - 0.00220924	"юг" - 0.00011296	"яж" - 0.000278056
"ще" - 0.00150541	"ыр" - 0.000505062	"ьт" - 0.000858062	"юд" - 0.000547965	"яз" - 0.000595756
"щи" - 0.00088413	"ыс" - 0.00113014	"ьу" - 0.000266651	"юе" - 3.96446e-05	"яи" - 0.000939523
"щн" - 2.00939e-05	"ыт" - 0.00101393	"ьф" - 4.45323e-05	"юж" - 0.000106443	"яй" - 0.000223205
"що" - 3.25846e-06	"ыу" - 0.000149346	"ьх" - 0.000136855	"юз" - 0.0001059	"як" - 0.00117359
"щр" - 5.43077e-06	"ыф" - 1.30339e-05	"ьц" - 0.000169983	"юи" - 0.000321502	"ял" - 0.000841227
"щс" - 2.17231e-06	"ых" - 0.00125614	"ьч" - 0.000658753	"юк" - 0.000343225	"ям" - 0.000849373
"щт" - 2.17231e-06	"ыц" - 9.77539e-06	"ьш" - 0.000500717	"юл" - 7.22293e-05	"ян" - 0.00216362
"щу" - 0.000113503	"ыч" - 0.000294348	"ьщ" - 1.24908e-05	"юм" - 0.000167811	"яо" - 0.0006001
"щъ" - 2.17231e-05	"ыш" - 0.000519725	"ьэ" - 0.000159665	"юн" - 0.000394817	"яп" - 0.00124636
"ье" - 0.000155863	"ыщ" - 3.31277e-05	"ью" - 0.000311183	"юо" - 0.000216145	"яр" - 0.000293262
"ьо" - 2.17231e-06	"ыз" - 8.20046e-05	"ья" - 0.000715776	"юп" - 0.000446952	"яс" - 0.00147337
"ьп" - 2.17231e-06	"ью" - 5.43077e-07	"эв" - 5.43077e-07	"юр" - 0.000200939	"ят" - 0.00245579
"ьт" - 4.34462e-06	"ья" - 3.91016e-05	"эг" - 7.06e-06	"юс" - 0.000483339	"яу" - 0.000270995
"ью" - 6.51693e-06	"ба" - 0.000206369	"эд" - 5.53939e-05	"ют" - 0.000690794	"яф" - 3.47569e-05
"ья" - 0.000132511	"ьб" - 0.000568602	"эз" - 1.08615e-06	"юγ" - 8.25477e-05	"ях" - 0.000357888
"ѣа" - 6.29969e-05	"ьв" - 0.00135769	"эй" - 2.87831e-05	"юф" - 3.74723e-05	"яц" - 4.45323e-05
"ьб" - 0.000399705	"ьг" - 0.000310097	"эк" - 0.000145545	"юх" - 7.65739e-05	"яч" - 0.000581636
"ьв" - 0.00147771	"ьд" - 0.00061422	"эл" - 1.46631e-05	"юц" - 2.22662e-05	"яш" - 7.22293e-05
"ьг" - 0.000259048	"ье" - 0.0010199	"эм" - 3.14985e-05	"юч" - 0.000303037	"ящ" - 0.000192792
"ьд" - 0.000376896	"ьж" - 7.82031e-05	"эн" - 2.17231e-06	"юш" - 0.000260677	"яэ" - 9.72108e-05
"ье" - 0.00171612	"ьз" - 0.000530586	"эп" - 1.08615e-05	"ющ" - 0.000376896	"яю" - 0.000107529
"ьж" - 6.62554e-05	"ьи" - 0.00101067	"эр" - 5.43077e-07	"юэ" - 2.55246e-05	"яя" - 0.000145002
"ьз" - 0.000207999	"ьй" - 5.43077e-07	"эс" - 7.06e-06	"юю" - 4.12739e-05	
"ьи" - 0.000459986	"ьк" - 0.00249978	"эт" - 0.001828	"юя" - 3.58431e-05	

Частота біграм без перетину:

З пропусками:

" а" - 0.00225709	" ю" - 4.18149e-05	"ау" - 7.90847e-05	"бх" - 4.636e-05	"ву" - 0.000614497
" б" - 0.0072267	" я" - 0.0013608	"аф" - 5.63592e-05	"бц" - 3.63608e-06	"вх" - 2.18165e-05
" в" - 0.0153224	"ё " - 4.7269e-05	"ах" - 0.000992649	"бч" - 1.99984e-05	"вц" - 2.90886e-05
" г" - 0.0040615	"ёг" - 3.63608e-06	"ац" - 4.45419e-05	"бш" - 3.27247e-05	"вч" - 8.09027e-05
" д" - 0.00820571	"ём" - 3.63608e-06	"ач" - 0.000732669	"бщ" - 0.000146352	"вш" - 0.00140262
" е" - 0.00356154	"ён" - 3.63608e-06	"аш" - 0.000739032	"бъ" - 0.000105446	"вщ" - 7.27215e-06
" ж" - 0.00206438	"ёр" - 3.63608e-06	"ащ" - 0.000220892	"бы" - 0.00383152	"въ" - 2.99976e-05
" з" - 0.00443601	"ёт" - 7.27215e-06	"аэ" - 9.09019e-07	"бь" - 4.45419e-05	"вы" - 0.0027416
" и" - 0.0103174	"а " - 0.0153897	"аю" - 0.000718125	"бю" - 9.09019e-06	"вь" - 0.000227255
" й" - 1.81804e-06	"аё" - 7.27215e-06	"ая" - 0.00179713	"бя" - 0.000531776	"вю" - 3.63608e-06
" к" - 0.00969832	"аб" - 0.000597225	"б " - 0.000229982	"в " - 0.00646767	"вя" - 0.000243617
" л" - 0.00237163	"ав" - 0.00308339	"ба" - 0.00155351	"ва" - 0.00521504	"г " - 0.000679037
" м" - 0.00518868	"аг" - 0.000679037	"бв" - 4.18149e-05	"вб" - 1.81804e-06	"га" - 0.000789938
" н" - 0.0165469	"ад" - 0.00162624	"бг" - 8.18117e-06	"вв" - 4.18149e-05	"гб" - 1.09082e-05
" о" - 0.0093938	"ае" - 0.00130262	"бд" - 1.45443e-05	"вг" - 4.18149e-05	"гв" - 5.45411e-06
" п" - 0.0171886	"аж" - 0.0015017	"бе" - 0.00223164	"вд" - 0.000341791	"гг" - 9.09019e-07
" р" - 0.00374607	"аз" - 0.00382697	"бж" - 2.45435e-05	"ве" - 0.00535958	"гд" - 0.000994467
" с" - 0.0151215	"аи" - 9.3629e-05	"бз" - 7.27215e-06	"вз" - 0.00045451	"ге" - 0.000443601
" т" - 0.00901383	"ай" - 0.000707217	"би" - 0.000619042	"ви" - 0.00297704	"гж" - 9.09019e-07
" у" - 0.0041024	"ак" - 0.00677583	"бк" - 0.000121809	"вк" - 0.000234527	"ги" - 0.000575409
" ф" - 0.000519959	"ал" - 0.0067731	"бл" - 0.000837207	"вл" - 0.000564501	"гк" - 0.00012999
" х" - 0.00170714	"ам" - 0.00359881	"бм" - 2.45435e-05	"вм" - 0.000128172	"гл" - 0.00123081
" ц" - 0.000293613	"ан" - 0.00358335	"бн" - 0.000294522	"вн" - 0.00117809	"гм" - 3.63608e-06
" ч" - 0.00667311	"ао" - 3.63608e-06	"бо" - 0.00198621	"во" - 0.00644404	"гн" - 0.000241799
" ш" - 0.000679037	"ап" - 0.000869931	"бр" - 0.00152261	"вр" - 0.000223619	"го" - 0.0081939
" щ" - 0.000170896	"ар" - 0.0024289	"бс" - 0.000122718	"вр" - 0.000607225	"гр" - 0.000698127
" ъ" - 7.27215e-06	"ас" - 0.00317975	"бт" - 7.27215e-06	"вс" - 0.00298249	"гс" - 1.27263e-05
" э" - 0.00184531	"ат" - 0.00439692	"бү" - 0.00137716	"вт" - 0.000174532	"гт" - 5.45411e-06

"гү" - 0.000730851	"дя" - 0.000334519	"жа" - 0.000969923	"зп" - 4.5451e-06	"ис" - 0.00225709
"гч" - 9.09019e-06	"е " - 0.0187785	"жб" - 6.09043e-05	"зр" - 0.000128172	"ит" - 0.00366244
"гш" - 7.27215e-06	"еа" - 1.72714e-05	"жд" - 0.000719034	"зс" - 6.54494e-05	"иу" - 4.5451e-06
"д " - 0.00109082	"еб" - 0.00149806	"же" - 0.00394696	"зт" - 1.90894e-05	"иф" - 0.000168169
"да" - 0.00496415	"ев" - 0.00186531	"жж" - 1.36353e-05	"зү" - 0.000227255	"их" - 0.00168441
"дб" - 2.36345e-05	"ег" - 0.00284705	"жи" - 0.0012899	"зц" - 8.18117e-06	"иц" - 0.0009172
"дв" - 0.000885385	"ед" - 0.00287432	"жк" - 0.000180895	"зч" - 4.45419e-05	"ич" - 0.0025498
"дг" - 1.81804e-06	"ее" - 0.0012999	"жл" - 2.27255e-05	"зш" - 1.54533e-05	"иш" - 0.000456328
"дд" - 2.54525e-05	"еж" - 0.000772666	"жм" - 2.27255e-05	"зъ" - 5.36321e-05	"ищ" - 0.000170896
"де" - 0.00457873	"ез" - 0.00100628	"жн" - 0.000904474	"зы" - 0.000371789	"иэ" - 1.81804e-06
"дж" - 3.63608e-06	"ей" - 0.00012999	"жо" - 2.36345e-05	"зь" - 0.000138171	"ию" - 0.000276342
"дз" - 7.27215e-06	"ей" - 0.00206711	"жр" - 3.63608e-06	"зю" - 4.5451e-06	"ия" - 0.00128263
"ди" - 0.00207711	"ек" - 0.00134444	"жс" - 3.63608e-05	"зя" - 0.000526322	"й " - 0.00703126
"дк" - 0.000259979	"ел" - 0.00591226	"жү" - 0.000171805	"и " - 0.018384	"йб" - 3.63608e-06
"дл" - 0.000609952	"ем" - 0.00406695	"жч" - 2.81796e-05	"иа" - 3.09066e-05	"йд" - 0.000128172
"дм" - 9.7265e-05	"ен" - 0.00648767	"жъ" - 5.45411e-05	"иб" - 0.000871749	"йк" - 0.000295431
"дн" - 0.00170441	"ео" - 0.000196348	"з " - 0.00130172	"ив" - 0.00222255	"йл" - 2.27255e-05
"до" - 0.003407	"еп" - 0.00100447	"за" - 0.00500324	"иг" - 0.000610861	"йм" - 9.7265e-05
"дп" - 0.000124536	"ер" - 0.00537503	"зб" - 0.000174532	"ид" - 0.00124263	"йн" - 0.000284523
"др" - 0.00139898	"ес" - 0.00437602	"зв" - 0.00101356	"ие" - 0.00206893	"йо" - 6.36313e-06
"дс" - 0.000459964	"ет" - 0.00507324	"зг" - 0.000232709	"иж" - 0.000273615	"йр" - 9.09019e-07
"дт" - 0.000156351	"еу" - 0.000109082	"зд" - 0.00110264	"из" - 0.00202984	"йс" - 0.00042633
"ду" - 0.00185803	"еф" - 9.09019e-06	"зе" - 0.00040815	"ии" - 0.00035179	"йт" - 0.000264525
"дх" - 5.36321e-05	"ех" - 0.000663584	"жж" - 0.000198166	"ий" - 0.00140807	"йх" - 3.63608e-06
"дц" - 0.000239981	"ец" - 0.000579045	"зз" - 2.18165e-05	"ик" - 0.00312339	"йц" - 3.81788e-05
"дч" - 3.45427e-05	"еч" - 0.00105537	"зи" - 0.000329065	"ил" - 0.00484144	"йч" - 5.09051e-05
"дш" - 8.81748e-05	"еш" - 0.000909928	"зк" - 9.81741e-05	"им" - 0.00264706	"йш" - 9.5447e-05
"дъ" - 4.7269e-05	"ещ" - 0.000776302	"зл" - 0.000144534	"ин" - 0.00316793	"к " - 0.00522231
"ды" - 0.0004536	"ею" - 0.00021271	"зм" - 0.000174532	"ио" - 0.00014817	"ка" - 0.0086175
"дъ" - 0.000825389	"ея" - 0.00012999	"зн" - 0.00164169	"ип" - 0.000241799	"кв" - 0.000146352
"дю" - 3.36337e-05	"ж " - 0.00062086	"зо" - 0.000570864	"ир" - 0.000626314	"қд" - 3.63608e-06

"ке" - 0.000701763	"лп" - 1.99984e-05	"мц" - 6.36313e-06	"нь" - 0.00130262	"оя" - 0.000536321
"кж" - 4.18149e-05	"лс" - 0.00141625	"мч" - 1.27263e-05	"ню" - 0.00013908	"п " - 5.09051e-05
"кз" - 1.81804e-06	"лт" - 6.36313e-05	"мщ" - 1.54533e-05	"ня" - 0.00103446	"па" - 0.00122627
"ки" - 0.00345882	"лу" - 0.00130899	"мы" - 0.000885385	"о " - 0.0216247	"пе" - 0.00226164
"кк" - 1.18172e-05	"лф" - 1.45443e-05	"мь" - 5.90862e-05	"об" - 0.00365971	"пи" - 0.000970832
"кл" - 0.00053723	"лц" - 3.63608e-06	"мя" - 0.000452691	"ов" - 0.00850569	"пк" - 0.000159987
"кн" - 0.000557229	"лч" - 8.27207e-05	"н " - 0.00344609	"ог" - 0.00422967	"пл" - 0.00065813
"ко" - 0.0102256	"лш" - 9.09019e-07	"на" - 0.00939198	"од" - 0.0051196	"пн" - 0.000123627
"кр" - 0.00142716	"лщ" - 7.27215e-06	"нб" - 1.54533e-05	"ое" - 0.00196075	"по" - 0.00953652
"кс" - 8.72658e-05	"лы" - 0.00059268	"нв" - 7.27215e-06	"ож" - 0.00182167	"пп" - 2.99976e-05
"кт" - 0.000420876	"ль" - 0.00387878	"нг" - 3.54517e-05	"оз" - 0.00148625	"пр" - 0.00727306
"ку" - 0.00240163	"лю" - 0.000957197	"нд" - 0.000169078	"ои" - 0.00079721	"пс" - 1.45443e-05
"кх" - 3.63608e-06	"ля" - 0.00133989	"не" - 0.00965651	"ой" - 0.00320702	"пт" - 6.18133e-05
"кц" - 5.45411e-06	"м " - 0.00782847	"нж" - 8.18117e-06	"ок" - 0.0020362	"пу" - 0.000594498
"кш" - 1.45443e-05	"ма" - 0.00233072	"нз" - 1.09082e-05	"ол" - 0.00569319	"пц" - 5.27231e-05
"л " - 0.00639586	"мб" - 1.90894e-05	"ни" - 0.00744487	"ом" - 0.00499779	"пч" - 7.18125e-05
"лё" - 7.27215e-06	"мг" - 2.45435e-05	"нк" - 0.000445419	"он" - 0.00492597	"пш" - 1.09082e-05
"ла" - 0.0046669	"ме" - 0.00383152	"нл" - 9.09019e-07	"оо" - 0.000188167	"пщ" - 2.36345e-05
"лб" - 4.9996e-05	"мз" - 3.63608e-06	"нн" - 0.00268433	"оп" - 0.00125717	"пы" - 0.000169987
"лв" - 6.45403e-05	"ми" - 0.00304885	"но" - 0.00971287	"ор" - 0.0059568	"пь" - 6.90854e-05
"лг" - 0.000174532	"мк" - 8.63568e-05	"нр" - 7.27215e-05	"ос" - 0.00568228	"пю" - 9.09019e-07
"лд" - 1.99984e-05	"мл" - 0.000156351	"нс" - 0.000327247	"от" - 0.00643131	"пя" - 0.000267252
"ле" - 0.0036079	"мм" - 2.63616e-05	"нт" - 0.000348154	"оу" - 8.27207e-05	"р " - 0.000768121
"лж" - 0.000301794	"мн" - 0.00130899	"ну" - 0.0026907	"оф" - 0.000106355	"рё" - 1.09082e-05
"лз" - 5.45411e-06	"мо" - 0.00279069	"нф" - 2.63616e-05	"ох" - 0.000535412	"ра" - 0.0063195
"ли" - 0.00635313	"мп" - 4.8178e-05	"нх" - 6.36313e-06	"оц" - 5.36321e-05	"рб" - 8.99929e-05
"лк" - 0.000323611	"мр" - 2.45435e-05	"нц" - 0.000281796	"оч" - 0.00203166	"рв" - 0.000223619
"лл" - 8.36297e-05	"мс" - 0.000119081	"нч" - 0.00018544	"ош" - 0.00111082	"рг" - 0.000179986
"лм" - 1.18172e-05	"мт" - 9.99921e-06	"нш" - 3.63608e-06	"ощ" - 0.000167259	"рд" - 0.000265434
"лн" - 0.000216347	"му" - 0.00199348	"нщ" - 5.90862e-05	"оэ" - 4.5451e-05	"ре" - 0.00560138
"ло" - 0.00564228	"мф" - 5.45411e-06	"ны" - 0.00346154	"ою" - 0.000883566	"рж" - 0.000266343

"pz" - 1.45443e-05	"cz" - 2.27255e-05	"tk" - 0.000561774	"yй" - 0.000134535	"фь" - 1.81804e-05
"pi" - 0.00491143	"ci" - 0.00131899	"tl" - 0.00015726	"yk" - 0.000860841	"фю" - 9.09019e-07
"pk" - 0.000425421	"ck" - 0.00384333	"tm" - 7.09035e-05	"yl" - 0.00112991	"фя" - 3.63608e-06
"pl" - 0.000119991	"cl" - 0.00268433	"tn" - 0.00126717	"ym" - 0.00108628	"х " - 0.00403241
"pm" - 0.000144534	"cm" - 0.000661766	"to" - 0.012789	"yn" - 0.00017635	"ха" - 0.000640858
"pn" - 0.000756304	"cn" - 0.000757213	"tp" - 0.000113627	"yn" - 0.00090811	"хв" - 0.000199075
"po" - 0.00762667	"co" - 0.00257525	"tr" - 0.00232527	"yr" - 0.000646313	"хе" - 0.000109082
"pi" - 9.09019e-05	"ci" - 0.00131717	"tc" - 0.00118172	"yc" - 0.00118536	"хи" - 0.000196348
"pp" - 1.18172e-05	"cp" - 0.000136353	"tt" - 4.9996e-05	"yt" - 0.00159806	"хл" - 0.0002318
"pc" - 0.000301794	"cc" - 0.00056541	"ty" - 0.00151533	"yf" - 3.63608e-06	"хм" - 2.63616e-05
"pt" - 0.000742669	"ct" - 0.00993194	"tf" - 1.18172e-05	"yx" - 0.000511778	"хн" - 0.000169987
"py" - 0.00272524	"cy" - 0.000747214	"tx" - 2.09074e-05	"yc" - 3.63608e-06	"хо" - 0.00213165
"pf" - 5.99953e-05	"cf" - 9.09019e-07	"tc" - 7.09035e-05	"yc" - 0.000862659	"хп" - 3.63608e-06
"px" - 0.000190894	"cx" - 0.000201802	"ty" - 0.000189076	"ys" - 0.000929926	"хр" - 0.000113627
"pi" - 2.36345e-05	"ci" - 1.63623e-05	"ts" - 1.90894e-05	"ys" - 0.000182713	"хс" - 3.18157e-05
"pi" - 6.45403e-05	"ci" - 0.00026907	"ts" - 3.63608e-06	"yз" - 9.09019e-06	"хт" - 1.36353e-05
"pi" - 0.000440874	"ci" - 8.18117e-05	"ty" - 1.72714e-05	"yu" - 0.00110719	"ху" - 0.000129081
"pi" - 9.99921e-06	"ci" - 4.5451e-05	"ty" - 0.0015826	"ya" - 2.72706e-05	"хш" - 1.81804e-05
"pi" - 0.00124899	"ci" - 0.00031543	"ty" - 0.00593499	"ф " - 1.63623e-05	"хю" - 9.09019e-07
"pi" - 0.000502688	"ci" - 0.00262797	"ty" - 0.000122718	"fa" - 0.00025907	"хя" - 9.09019e-07
"pi" - 0.000133626	"ci" - 0.000159078	"ty" - 0.000557229	"fe" - 0.00024089	"ц " - 0.000562683
"pi" - 0.000955379	"ci" - 0.00388606	"y " - 0.00634404	"fi" - 0.000182713	"ца" - 0.000723579
"c " - 0.00259707	"t " - 0.0056641	"ya" - 1.81804e-05	"fl" - 1.90894e-05	"цв" - 7.90847e-05
"cё" - 7.27215e-05	"ta" - 0.00545775	"yb" - 0.00085266	"fn" - 3.63608e-06	"це" - 0.000742669
"ca" - 0.00168078	"tb" - 1.18172e-05	"yb" - 0.000714489	"fo" - 6.72674e-05	"ци" - 0.000161805
"cb" - 5.63592e-05	"tv" - 0.00198166	"yg" - 0.00114718	"fp" - 0.000167259	"цк" - 2.54525e-05
"cv" - 0.00127354	"ti" - 1.45443e-05	"yd" - 0.00193621	"fc" - 3.63608e-06	"цм" - 9.09019e-07
"ci" - 1.90894e-05	"td" - 0.000111809	"ye" - 0.000243617	"ft" - 1.72714e-05	"цо" - 0.000252707
"cd" - 0.000230891	"te" - 0.00505869	"yj" - 0.00184713	"fy" - 3.36337e-05	"цу" - 0.000248162
"ce" - 0.00379243	"tz" - 3.90878e-05	"yz" - 0.000381788	"ff" - 1.81804e-06	"цы" - 0.000198166
"cj" - 7.27215e-06	"ti" - 0.00292795	"yi" - 4.5451e-06	"fy" - 1.18172e-05	"ч " - 0.000586317

"ча" - 0.0020562	"ца" - 0.000336337	"ыу" - 8.18117e-06	"эг" - 4.5451e-06	"юш" - 0.00015726
"чв" - 4.5451e-06	"ще" - 0.00125263	"ых" - 0.000977195	"эд" - 5.45411e-05	"ющ" - 0.000322702
"че" - 0.00334519	"щи" - 0.000719034	"ыц" - 4.5451e-06	"эй" - 3.99968e-05	"юю" - 4.18149e-05
"чи" - 0.00355608	"щн" - 1.99984e-05	"ыч" - 0.000119081	"эк" - 0.000122718	"я " - 0.0095747
"чк" - 0.000569046	"цо" - 3.63608e-06	"ыш" - 0.000420876	"эл" - 1.45443e-05	"яб" - 2.90886e-05
"чл" - 1.27263e-05	"цр" - 9.09019e-06	"ыщ" - 3.09066e-05	"эм" - 1.27263e-05	"яв" - 0.000276342
"чн" - 0.000762667	"щү" - 7.09035e-05	"ь " - 0.0103655	"эн" - 9.09019e-07	"яг" - 8.27207e-05
"чо" - 0.000125445	"щъ" - 1.09082e-05	"ьб" - 0.000108173	"эп" - 6.36313e-06	"яд" - 0.000469054
"чр" - 5.09051e-05	"ъ " - 3.63608e-06	"ьв" - 1.27263e-05	"эр" - 9.09019e-07	"яе" - 6.90854e-05
"чт" - 0.00389333	"ье" - 0.000111809	"ьг" - 6.45403e-05	"эс" - 4.5451e-06	"яж" - 0.000134535
"чү" - 0.000736305	"ью" - 4.5451e-06	"ьд" - 6.90854e-05	"эт" - 0.00147534	"яз" - 0.000236345
"чш" - 0.000136353	"ья" - 8.18117e-05	"ье" - 0.000533594	"эф" - 8.18117e-06	"яи" - 9.27199e-05
"чъ" - 0.000192712	"ы " - 0.00430148	"ьж" - 1.09082e-05	"эх" - 5.63592e-05	"яй" - 0.000198166
"ш " - 0.000168169	"ьб" - 0.000173623	"ьз" - 0.000179986	"ю " - 0.00345427	"як" - 0.000368153
"ша" - 0.000984468	"ьв" - 0.00081539	"ьи" - 8.27207e-05	"юб" - 0.000299976	"ял" - 0.000615406
"шв" - 2.27255e-05	"ьг" - 0.000134535	"ьй" - 9.09019e-07	"юг" - 9.09019e-07	"ям" - 0.000466327
"ше" - 0.00197439	"ьд" - 7.63576e-05	"ьк" - 0.00147625	"юд" - 0.000284523	"ян" - 0.00073176
"ши" - 0.00210983	"ье" - 0.0013408	"ьм" - 0.000312703	"юж" - 1.54533e-05	"яо" - 3.63608e-06
"шк" - 0.000863568	"ьж" - 1.99984e-05	"ьн" - 0.00107901	"юз" - 6.36313e-06	"яп" - 3.36337e-05
"шл" - 0.000460873	"ьз" - 4.9087e-05	"ьо" - 1.36353e-05	"юк" - 1.45443e-05	"яр" - 8.90839e-05
"шн" - 0.000257252	"ьи" - 1.45443e-05	"ьс" - 0.000975377	"юл" - 1.09082e-05	"яс" - 0.000419058
"шо" - 0.00033361	"ьй" - 0.00145898	"ьт" - 0.000175441	"юм" - 4.09059e-05	"ят" - 0.00153715
"шп" - 5.09051e-05	"ык" - 0.000274524	"ьф" - 9.09019e-07	"юн" - 2.81796e-05	"ях" - 0.000205438
"шр" - 3.63608e-06	"ыл" - 0.00226709	"ьц" - 0.000131808	"юр" - 7.45396e-05	"яц" - 1.54533e-05
"шт" - 5.72682e-05	"ым" - 0.0012399	"ьч" - 4.7269e-05	"юс" - 0.000122718	"яч" - 9.90831e-05
"шү" - 0.000257252	"ын" - 0.000201802	"ьш" - 0.000360881	"ют" - 0.00036179	"яш" - 1.27263e-05
"шы" - 3.63608e-06	"ып" - 0.000190894	"ьщ" - 1.81804e-06	"юф" - 1.09082e-05	"ящ" - 0.000171805
"шь" - 0.000652676	"ыр" - 0.000369971	"ью" - 0.000270888	"юх" - 5.18141e-05	"яю" - 9.09019e-05
"шю" - 9.09019e-07	"ыс" - 0.000510869	"ья" - 0.000477235	"юц" - 3.63608e-06	"яя" - 6.72674e-05
"щ " - 1.27263e-05	"ыт" - 0.00063904	"э " - 2.72706e-06	"юч" - 8.09027e-05	

Без пропуска:

"ёб" - 2.17231e-06	"ай" - 0.000890646	"бк" - 0.000161837	"ви" - 0.00398075	"гж" - 2.17231e-06
"ёв" - 4.34461e-06	"ак" - 0.00934853	"бл" - 0.000947126	"вк" - 0.0010123	"гз" - 5.75661e-05
"ёр" - 6.51692e-06	"ал" - 0.00853608	"бм" - 2.60677e-05	"вл" - 0.000810271	"ги" - 0.000797237
"ёе" - 2.17231e-06	"ам" - 0.00481818	"бн" - 0.000366034	"вм" - 0.000374723	"гк" - 0.000173785
"ёз" - 4.34461e-06	"ан" - 0.00606834	"бо" - 0.00241669	"вн" - 0.00206695	"гл" - 0.00136638
"ей" - 1.08615e-05	"ао" - 0.00101555	"бп" - 1.62923e-05	"во" - 0.0081657	"гм" - 1.73785e-05
"ёк" - 2.17231e-06	"ап" - 0.00289894	"бр" - 0.00183886	"вп" - 0.001122	"гн" - 0.00036712
"ём" - 4.34461e-06	"ар" - 0.0032791	"бс" - 0.000168354	"вр" - 0.00103836	"го" - 0.00972325
"ён" - 6.51692e-06	"ас" - 0.00558392	"бт" - 3.25846e-05	"вс" - 0.0044402	"гп" - 0.000103185
"ео" - 2.17231e-06	"ат" - 0.00640396	"бү" - 0.00170852	"вт" - 0.000807012	"гр" - 0.000894991
"еп" - 4.34461e-06	"ау" - 0.000546335	"бх" - 4.99631e-05	"вү" - 0.000878698	"гс" - 0.000101012
"ёр" - 1.08615e-05	"аф" - 0.000158578	"бц" - 6.51692e-06	"вф" - 1.84646e-05	"гт" - 3.25846e-05
"ёс" - 1.30338e-05	"ах" - 0.00136638	"бч" - 1.30338e-05	"вх" - 0.000111874	"гү" - 0.000949298
"ёт" - 8.68923e-06	"ац" - 9.884e-05	"бш" - 2.38954e-05	"вц" - 5.21354e-05	"гх" - 1.08615e-06
"ёү" - 2.17231e-06	"ач" - 0.00166507	"бщ" - 0.000161837	"вч" - 0.000280228	"гч" - 3.91015e-05
"ёф" - 4.34461e-06	"аш" - 0.00102316	"бъ" - 8.58061e-05	"вш" - 0.00165313	"гш" - 7.60308e-06
"ёх" - 2.17231e-06	"ащ" - 0.000307382	"бы" - 0.00463136	"вщ" - 1.08615e-05	"гэ" - 3.25846e-06
"ёц" - 2.17231e-06	"аэ" - 0.000259591	"бь" - 4.99631e-05	"вь" - 2.06369e-05	"гя" - 2.17231e-06
"ёч" - 6.51692e-06	"аю" - 0.000926489	"бэ" - 5.53938e-05	"вы" - 0.00329105	"да" - 0.00604119
"аё" - 8.68923e-06	"ая" - 0.00228744	"бю" - 1.52062e-05	"вь" - 0.000220489	"дб" - 8.03754e-05
"аа" - 0.000262849	"ба" - 0.00182257	"бя" - 0.000639745	"вэ" - 0.000194422	"дв" - 0.00114155
"аб" - 0.00147934	"бб" - 4.34461e-06	"ва" - 0.00622149	"вю" - 4.34461e-06	"дг" - 6.08246e-05
"ав" - 0.00548833	"бв" - 8.472e-05	"вб" - 0.000238954	"вя" - 0.00038124	"дд" - 8.14615e-05
"ар" - 0.00120998	"бр" - 1.412e-05	"вв" - 0.000471391	"га" - 0.000951471	"де" - 0.00546987
"ад" - 0.0028555	"бд" - 3.47569e-05	"вр" - 0.000475735	"гб" - 2.38954e-05	"дж" - 9.77538e-06
"ае" - 0.0020083	"бе" - 0.00271104	"вд" - 0.000867837	"гв" - 0.000106443	"дз" - 7.16861e-05
"аж" - 0.00182257	"бж" - 2.06369e-05	"ве" - 0.00646153	"гг" - 1.19477e-05	"ди" - 0.00265999
"аз" - 0.00481492	"бз" - 1.73785e-05	"вж" - 7.49446e-05	"гд" - 0.00124799	"дк" - 0.000439892
"аи" - 0.00120346	"би" - 0.000747274	"вз" - 0.000661468	"ге" - 0.000544163	"дл" - 0.000711431

"дм" - 0.000159665	"ем" - 0.00567081	"жп" - 6.08246e-05	"зх" - 7.60308e-06	"иф" - 0.000281314
"дн" - 0.00229722	"ен" - 0.00977321	"жр" - 1.08615e-05	"зц" - 1.73785e-05	"их" - 0.00232437
"до" - 0.00396337	"ео" - 0.00146196	"жс" - 7.60308e-05	"зч" - 0.000101012	"иц" - 0.0011535
"дп" - 0.000224834	"еп" - 0.0038048	"жт" - 8.25477e-05	"зш" - 1.412e-05	"ич" - 0.00384824
"др" - 0.0017889	"ер" - 0.00695356	"жу" - 0.00024004	"зщ" - 1.08615e-06	"иш" - 0.000702741
"дс" - 0.000700569	"ес" - 0.00738476	"жф" - 2.17231e-06	"зъ" - 5.86523e-05	"ищ" - 0.000227006
"дт" - 0.00026828	"ет" - 0.00729461	"жх" - 1.412e-05	"зы" - 0.000454012	"иэ" - 0.000175957
"ду" - 0.00226137	"еу" - 0.000706	"жч" - 5.53938e-05	"зь" - 0.000168354	"ию" - 0.000363861
"дх" - 8.472e-05	"еф" - 8.79785e-05	"жб" - 6.19108e-05	"зэ" - 3.25846e-05	"ия" - 0.00171721
"дц" - 0.000286745	"ех" - 0.00116436	"жэ" - 1.84646e-05	"зю" - 5.43077e-06	"йа" - 0.000147717
"дч" - 7.82031e-05	"ец" - 0.000727723	"жя" - 2.28092e-05	"зя" - 0.000631055	"йб" - 0.000375809
"дш" - 8.68923e-05	"еч" - 0.00219838	"за" - 0.00617913	"иа" - 0.000272625	"йв" - 0.000581092
"дщ" - 2.17231e-06	"еш" - 0.00111982	"зб" - 0.000291089	"иб" - 0.0019301	"йг" - 0.00026828
"дъ" - 6.84277e-05	"ещ" - 0.000942781	"зв" - 0.00130556	"ив" - 0.00496807	"йд" - 0.000648434
"ды" - 0.000553938	"еэ" - 0.000242212	"зг" - 0.000361689	"иг" - 0.0011926	"йе" - 0.000124908
"дъ" - 0.00104488	"ею" - 0.000292175	"зд" - 0.00133162	"ид" - 0.00260568	"йж" - 0.000122735
"дэ" - 1.412e-05	"ея" - 0.000336708	"зе" - 0.00048008	"ие" - 0.00297823	"йз" - 0.000175957
"дю" - 3.25846e-05	"жа" - 0.00115675	"эж" - 0.00018356	"иж" - 0.000500717	"йи" - 0.00060716
"дя" - 0.000389929	"жб" - 0.000109702	"зз" - 8.472e-05	"из" - 0.00306078	"йк" - 0.000964504
"еа" - 0.000258505	"жв" - 5.648e-05	"зи" - 0.000464874	"ии" - 0.00165421	"йл" - 0.000152062
"еб" - 0.00300213	"жг" - 3.25846e-06	"зк" - 0.0002824	"ий" - 0.00155103	"йм" - 0.00045184
"ев" - 0.00439675	"жд" - 0.000913455	"зл" - 0.00024004	"ик" - 0.00495069	"йн" - 0.00117956
"ег" - 0.00402746	"же" - 0.00484642	"зм" - 0.000262849	"ил" - 0.00597385	"йо" - 0.000359517
"ед" - 0.00469436	"жж" - 1.73785e-05	"зн" - 0.00218969	"им" - 0.00380805	"ип" - 0.000939523
"ее" - 0.00191163	"жз" - 3.25846e-05	"зо" - 0.000725551	"ин" - 0.00603141	"йр" - 0.000306295
"еж" - 0.00110245	"жи" - 0.00159122	"зп" - 0.000172698	"ио" - 0.00150432	"йс" - 0.00142395
"ез" - 0.00206152	"жк" - 0.000227006	"зр" - 0.000207455	"ип" - 0.00298258	"йт" - 0.000673415
"еи" - 0.00140114	"жл" - 2.71538e-05	"зс" - 0.000172698	"ир" - 0.00118825	"йу" - 0.000213972
"ей" - 0.00237542	"жм" - 6.95138e-05	"зт" - 0.000111874	"ис" - 0.00460095	"йф" - 4.34461e-05
"ек" - 0.0025731	"жн" - 0.0012078	"зү" - 0.00033888	"ит" - 0.00550354	"йх" - 9.01508e-05
"ел" - 0.00743689	"жо" - 9.66677e-05	"зф" - 1.19477e-05	"иу" - 0.000551766	"йц" - 7.38585e-05

"йч" - 0.000424686	"кэ" - 4.45323e-05	"лэ" - 5.53938e-05	"мю" - 3.25846e-06	"ня" - 0.00128275
"йш" - 0.000202025	"кю" - 1.08615e-06	"лю" - 0.00107421	"мя" - 0.000598471	"оа" - 0.000230265
"йщ" - 1.52062e-05	"кя" - 8.25477e-05	"ля" - 0.00165964	"на" - 0.011056	"об" - 0.00581744
"йэ" - 6.19108e-05	"лё" - 4.34461e-06	"ма" - 0.00298041	"нб" - 0.000270452	"ов" - 0.0127047
"йю" - 8.68923e-06	"ла" - 0.00592171	"мб" - 0.00038124	"нв" - 0.000385585	"ог" - 0.00562519
"йя" - 7.92892e-05	"лб" - 0.000422514	"мв" - 0.000812443	"нг" - 0.000123822	"од" - 0.00714472
"ка" - 0.0105694	"лв" - 0.000773341	"мг" - 0.000308468	"нд" - 0.000356258	"ое" - 0.00304666
"кб" - 0.000397532	"лг" - 0.000364948	"мд" - 0.000598471	"не" - 0.0115078	"ож" - 0.00287614
"кв" - 0.000750532	"лд" - 0.000286745	"ме" - 0.00453686	"нж" - 2.60677e-05	"оз" - 0.00261111
"кг" - 0.000171612	"ле" - 0.00460203	"мж" - 0.000134683	"нз" - 0.000135769	"ои" - 0.00218751
"кд" - 0.0002824	"лж" - 0.000383412	"мз" - 0.000213972	"ни" - 0.00916388	"ой" - 0.00373637
"ке" - 0.000964504	"лз" - 0.000159665	"ми" - 0.00445757	"нк" - 0.000672329	"ок" - 0.00363861
"кж" - 0.000178129	"ли" - 0.00799192	"мк" - 0.000608246	"нл" - 4.34461e-05	"ол" - 0.00708172
"кз" - 0.000131425	"лк" - 0.000775514	"мл" - 0.000328018	"нм" - 0.000123822	"ом" - 0.00688296
"ки" - 0.0045651	"лл" - 0.000154234	"мм" - 0.000297606	"нн" - 0.00377656	"он" - 0.00860777
"кк" - 0.000362775	"лм" - 0.000206369	"мн" - 0.00244602	"но" - 0.0116588	"оо" - 0.00179215
"кл" - 0.000753791	"лн" - 0.00106552	"мо" - 0.00399161	"нп" - 0.000478994	"оп" - 0.00407959
"км" - 0.000174871	"ло" - 0.00774971	"мп" - 0.00103293	"нр" - 0.000175957	"ор" - 0.00755854
"кн" - 0.00140983	"лп" - 0.000827649	"мр" - 0.000284572	"нс" - 0.000878698	"ос" - 0.00908242
"ко" - 0.0125168	"лр" - 0.000124908	"мс" - 0.000987314	"нт" - 0.000496372	"от" - 0.00898358
"кп" - 0.00053656	"лс" - 0.00237976	"мт" - 0.000411652	"ну" - 0.0033182	"оу" - 0.000777686
"кр" - 0.00186818	"лт" - 0.000400791	"му" - 0.00265782	"нф" - 2.28092e-05	"оф" - 0.000192249
"кс" - 0.000713603	"лу" - 0.00172155	"мф" - 3.25846e-05	"нх" - 6.40831e-05	"ох" - 0.000894991
"кт" - 0.000914541	"лф" - 3.80154e-05	"мх" - 0.00012708	"нц" - 0.000397532	"оц" - 0.00012708
"ку" - 0.00305318	"лх" - 3.36708e-05	"мц" - 2.38954e-05	"нч" - 0.000343225	"оч" - 0.00360929
"кф" - 1.52062e-05	"лц" - 2.17231e-06	"мч" - 0.000470305	"нш" - 1.62923e-05	"ош" - 0.00146414
"кх" - 4.77908e-05	"лч" - 0.000716861	"мш" - 4.56185e-05	"нщ" - 6.62554e-05	"ощ" - 0.000217231
"кц" - 1.08615e-05	"лш" - 3.36708e-05	"мщ" - 2.93262e-05	"ны" - 0.00397532	"оэ" - 0.000259591
"кч" - 0.000330191	"лщ" - 1.30338e-05	"мы" - 0.00101773	"нь" - 0.00160642	"ою" - 0.00108724
"кш" - 3.47569e-05	"лы" - 0.000694052	"мь" - 7.38585e-05	"нэ" - 2.824e-05	"оя" - 0.000868923
"кщ" - 6.51692e-06	"ль" - 0.00465634	"мэ" - 9.01508e-05	"нью" - 0.000210714	"па" - 0.00143046

"пв" - 4.34461e-06	"ри" - 0.00599557	"си" - 0.00172698	"тз" - 0.000202025	"уж" - 0.00238085
"пг" - 2.17231e-06	"рк" - 0.000634314	"ск" - 0.00469327	"ти" - 0.00408285	"уз" - 0.000623452
"пд" - 9.77538e-06	"рл" - 0.0001412	"сл" - 0.00326498	"тй" - 1.08615e-06	"уй" - 0.000614763
"пе" - 0.0026198	"рм" - 0.000210714	"см" - 0.000938437	"тк" - 0.00103619	"уй" - 0.000172698
"пи" - 0.00119368	"рн" - 0.00100035	"сн" - 0.00131207	"тл" - 0.000311726	"ук" - 0.00144567
"пк" - 0.000192249	"ро" - 0.00934418	"со" - 0.0032237	"тм" - 0.000260677	"ул" - 0.00134574
"пл" - 0.000799409	"рп" - 0.000217231	"сп" - 0.00183886	"тн" - 0.00221901	"ум" - 0.00161077
"пн" - 0.000147717	"рр" - 3.25846e-05	"ср" - 0.000244385	"то" - 0.0158622	"ун" - 0.00124799
"по" - 0.0115111	"рс" - 0.000433375	"сс" - 0.00101338	"тп" - 0.000703828	"уо" - 0.000353
"пп" - 2.60677e-05	"рт" - 0.000966677	"ст" - 0.0119738	"тр" - 0.00299127	"уп" - 0.00181714
"пр" - 0.00866208	"ру" - 0.00321067	"су" - 0.00100035	"тс" - 0.00188122	"ур" - 0.000841769
"пс" - 1.62923e-05	"рф" - 6.19108e-05	"сф" - 2.824e-05	"тт" - 0.000484425	"ус" - 0.00214081
"пт" - 7.06e-05	"рх" - 0.000196594	"сх" - 0.000246557	"ту" - 0.00197354	"ут" - 0.00238519
"пү" - 0.000704914	"рц" - 3.14985e-05	"сц" - 3.04123e-05	"тф" - 2.06369e-05	"үү" - 0.000106443
"пх" - 2.17231e-06	"рч" - 9.884e-05	"сч" - 0.000394274	"тх" - 7.92892e-05	"үф" - 4.45323e-05
"пц" - 7.06e-05	"рш" - 0.000495286	"сш" - 9.884e-05	"тц" - 9.77538e-05	"үх" - 0.000670157
"пч" - 7.82031e-05	"рщ" - 2.38954e-05	"сщ" - 5.43077e-06	"тч" - 0.000492028	"үц" - 8.68923e-06
"пш" - 1.84646e-05	"ры" - 0.0015608	"съ" - 4.77908e-05	"тш" - 2.824e-05	"үч" - 0.00152496
"пщ" - 2.38954e-05	"рь" - 0.000644089	"сы" - 0.000355172	"тщ" - 8.68923e-06	"үш" - 0.00113612
"пы" - 0.000231351	"рэ" - 4.34461e-06	"сь" - 0.00318895	"тъ" - 1.52062e-05	"үщ" - 0.000243298
"пь" - 7.60308e-05	"рю" - 0.000195508	"сэ" - 3.80154e-05	"ты" - 0.00178564	"үь" - 4.34461e-06
"пя" - 0.000346483	"ря" - 0.00111331	"сю" - 0.000202025	"ть" - 0.00703828	"үэ" - 9.99261e-05
"рё" - 6.51692e-06	"сё" - 7.38585e-05	"ся" - 0.0047693	"тэ" - 9.99261e-05	"үю" - 0.00130013
"ра" - 0.00748903	"са" - 0.00209085	"тё" - 4.34461e-06	"тю" - 0.000134683	"үя" - 0.000120563
"рб" - 0.000132511	"сб" - 0.000198766	"та" - 0.00663749	"тя" - 0.000699483	"фа" - 0.000283486
"рв" - 0.000360603	"св" - 0.00177695	"тб" - 0.000354086	"ya" - 0.000164009	"фе" - 0.000276969
"рг" - 0.000230265	"сг" - 9.12369e-05	"тв" - 0.00319546	"yb" - 0.00119368	"фз" - 1.08615e-06
"рд" - 0.000373637	"сд" - 0.000457271	"тг" - 0.000177043	"yb" - 0.00150215	"фи" - 0.000223748
"ре" - 0.00667116	"се" - 0.00466069	"тд" - 0.000427945	"yr" - 0.00162054	"фк" - 1.08615e-06
"рж" - 0.000280228	"сж" - 5.86523e-05	"те" - 0.00647999	"yd" - 0.00265022	"фл" - 2.49815e-05
"рз" - 6.08246e-05	"сз" - 8.25477e-05	"тж" - 0.000232437	"ye" - 0.000396446	"фм" - 4.34461e-06

"фн" - 2.17231e-06	"хф" - 1.19477e-05	"цч" - 2.28092e-05	"ша" - 0.00116762	"цт" - 2.17231e-06
"фо" - 9.884e-05	"хх" - 3.69292e-05	"цы" - 0.000233523	"шб" - 1.412e-05	"цу" - 0.000114046
"фр" - 0.000182474	"хц" - 1.30338e-05	"цэ" - 6.51692e-06	"шв" - 4.01877e-05	"цъ" - 2.17231e-05
"фс" - 9.77538e-06	"хч" - 0.000148803	"цю" - 2.17231e-06	"шг" - 6.51692e-06	"ье" - 0.000154234
"фт" - 2.60677e-05	"хш" - 5.43077e-05	"чө" - 2.17231e-06	"шд" - 1.52062e-05	"ьо" - 2.17231e-06
"фү" - 4.12738e-05	"хщ" - 6.51692e-06	"ча" - 0.00235695	"ше" - 0.00230265	"ьп" - 2.17231e-06
"фф" - 3.25846e-06	"хъ" - 2.17231e-06	"чб" - 7.60308e-06	"шж" - 2.17231e-06	"ьт" - 4.34461e-06
"фч" - 4.34461e-06	"хэ" - 3.91015e-05	"чв" - 5.97385e-05	"шз" - 3.25846e-06	"ью" - 4.34461e-06
"фы" - 1.30338e-05	"хю" - 3.25846e-06	"чг" - 8.68923e-06	"ши" - 0.0026513	"ья" - 0.000136855
"фь" - 2.60677e-05	"хя" - 2.71538e-05	"чд" - 3.04123e-05	"шк" - 0.00101338	"ья" - 6.19108e-05
"фю" - 1.08615e-06	"ца" - 0.000849372	"че" - 0.00409697	"шл" - 0.000524612	"ьб" - 0.000401877
"фя" - 6.51692e-06	"цб" - 3.04123e-05	"чж" - 4.34461e-06	"шм" - 1.08615e-05	"ьв" - 0.00148694
"ха" - 0.000839597	"цв" - 0.000153148	"чз" - 1.52062e-05	"шн" - 0.00032476	"ьг" - 0.000261763
"хб" - 0.000224834	"цг" - 1.84646e-05	"чи" - 0.00418929	"шо" - 0.000422514	"ьд" - 0.000374723
"хв" - 0.000582178	"цд" - 2.93262e-05	"чк" - 0.000714689	"шп" - 7.49446e-05	"ье" - 0.00172373
"хг" - 0.000137942	"це" - 0.000870009	"чл" - 2.06369e-05	"шр" - 2.17231e-06	"ьж" - 6.40831e-05
"хд" - 0.000280228	"цэ" - 2.824e-05	"чм" - 9.77538e-06	"шс" - 1.08615e-05	"ьз" - 0.0002118
"хе" - 0.000188991	"ци" - 0.000235695	"чн" - 0.000981883	"шт" - 8.36338e-05	"ьи" - 0.000450754
"хж" - 3.69292e-05	"цк" - 8.25477e-05	"чо" - 0.000175957	"шу" - 0.00031064	"ьй" - 0.00178238
"хз" - 0.00011296	"цл" - 2.17231e-06	"чп" - 0.000111874	"шх" - 4.34461e-06	"ьк" - 0.000638658
"хи" - 0.00059304	"цм" - 4.01877e-05	"чр" - 6.95138e-05	"шч" - 3.25846e-06	"ьл" - 0.00276861
"хк" - 0.000295434	"цн" - 6.19108e-05	"чс" - 5.648e-05	"шы" - 2.17231e-06	"ьм" - 0.00167702
"хл" - 0.000387757	"цо" - 0.000344311	"чт" - 0.00447061	"шь" - 0.000745101	"ьн" - 0.000885215
"хм" - 0.000195508	"цп" - 8.25477e-05	"чү" - 0.000901508	"шя" - 2.17231e-06	"ьо" - 0.000275883
"хн" - 0.000612591	"цр" - 1.412e-05	"чф" - 1.08615e-06	"ца" - 0.00038124	"ьп" - 0.000742929
"хо" - 0.00295325	"цс" - 7.82031e-05	"чх" - 8.68923e-06	"це" - 0.00151627	"ьр" - 0.00050832
"хп" - 0.000575661	"цт" - 3.14985e-05	"чч" - 2.60677e-05	"ци" - 0.000883043	"ьс" - 0.00112417
"хр" - 0.000218317	"цү" - 0.000258505	"чш" - 0.000159665	"цн" - 1.62923e-05	"ьт" - 0.00101121
"хс" - 0.000492028	"цф" - 2.17231e-06	"чь" - 0.000236782	"цо" - 3.25846e-06	"ьү" - 0.000140114
"хт" - 0.000212886	"цх" - 2.17231e-06	"чэ" - 6.51692e-06	"цпр" - 5.43077e-06	"ьф" - 1.30338e-05
"хү" - 0.000291089	"цц" - 2.17231e-06	"чя" - 1.08615e-05	"цс" - 2.17231e-06	"ьх" - 0.00125125

"ыц" - 6.51692e-06	"ьр" - 0.000265022	"эс" - 7.60308e-06	"ют" - 0.00069188	"ял" - 0.000843941
"ыч" - 0.000301951	"ьс" - 0.00218208	"эт" - 0.00183669	"юу" - 7.60308e-05	"ям" - 0.000849372
"ыш" - 0.000527871	"ьт" - 0.000856975	"эф" - 8.68923e-06	"юф" - 3.58431e-05	"ян" - 0.002181
"ыщ" - 3.36708e-05	"ьу" - 0.000267194	"эх" - 6.73415e-05	"юх" - 7.49446e-05	"яо" - 0.000591954
"ыэ" - 8.25477e-05	"ьф" - 4.67046e-05	"ээ" - 5.43077e-06	"юц" - 2.28092e-05	"яп" - 0.00125342
"ью" - 1.08615e-06	"ьх" - 0.0001412	"юа" - 7.92892e-05	"юч" - 0.000303037	"яр" - 0.000284572
"ья" - 3.91015e-05	"ьц" - 0.00016944	"юб" - 0.000459443	"юш" - 0.000263935	"яс" - 0.00147934
"ба" - 0.000210714	"ьч" - 0.000648434	"юв" - 0.000280228	"ющ" - 0.000383412	"ят" - 0.00245797
"бб" - 0.000572403	"ьш" - 0.000514837	"юг" - 0.000111874	"юэ" - 2.71538e-05	"яу" - 0.000262849
"бв" - 0.00136204	"ьщ" - 1.19477e-05	"юд" - 0.000549594	"юю" - 4.34461e-05	"яф" - 3.36708e-05
"бг" - 0.000309554	"ьэ" - 0.00015532	"юе" - 4.12738e-05	"юя" - 3.58431e-05	"ях" - 0.000358431
"бд" - 0.00062128	"ью" - 0.000320415	"юж" - 0.000109702	"яа" - 0.000156406	"яц" - 4.12738e-05
"бе" - 0.00102424	"ья" - 0.00072012	"юз" - 0.000104271	"яб" - 0.000506148	"яч" - 0.000585437
"бж" - 8.03754e-05	"эг" - 6.51692e-06	"юи" - 0.000314985	"яв" - 0.00153582	"яш" - 6.73415e-05
"бз" - 0.000539818	"эд" - 5.53938e-05	"юк" - 0.000349741	"яг" - 0.000351914	"ящ" - 0.000196594
"би" - 0.00101664	"эз" - 2.17231e-06	"юл" - 7.27723e-05	"яд" - 0.00115024	"яэ" - 0.000104271
"бк" - 0.00250793	"эй" - 2.824e-05	"юм" - 0.000168354	"яе" - 0.000333449	"яю" - 0.000105357
"бл" - 0.000188991	"эк" - 0.000148803	"юн" - 0.000400791	"яж" - 0.000278055	"яя" - 0.000144458
"бм" - 0.00069188	"эл" - 1.19477e-05	"юо" - 0.000217231	"яз" - 0.000583265	
"бн" - 0.00258505	"эм" - 3.14985e-05	"юп" - 0.000444237	"яи" - 0.000952557	
"бо" - 0.000749446	"эн" - 3.25846e-06	"юр" - 0.000192249	"яй" - 0.000221575	
"бп" - 0.00115893	"еп" - 1.08615e-05	"юс" - 0.000470305	"як" - 0.0011535	

Ентропія та надлишковість:

	Ентропія	Налишковість
Монограма з пропусками	4.38201	0.138665
Монограма без пропусків	4.46923	0.11402
Біграма з перетином та з пропусками	3.9619	0.221243
Біг рама з перетином та без пропусків	4.1368	0.179921
Біграма без перетину та з пропусками	3.96137	0.221346
Біг рама без перетину та без пропусків	4.13653	0.179975
H(10)	2.3262<H<3.07095	0.53476<R<0.38581
H(20)	1,91633<H<2.6738	0.61673<R<0.46524
H(30)	1.54759<H<2.28462	0.69048<R<0.54308

Произвольная часть текста:
так_несправедливы_к_детям_та_не_совсем_чистая_сделка_о_которой_вы_почти_заб

Использованные буквы:

Порядок n-граммы:
5 символов
10 символов
15 символов
20 символов
25 символов
30 символов
35 символов
40 символов
45 символов
50 символов

Введенный символ: **а**

Символ по счету: **1**

Номер эксперимента: **50**

Неравенство для энтропии:
 $2,3262019401947 < H < 3,07095543307631$

Двоичная таблица угаданных символов:

00000100000000000000000000000000	▲
00000010000000000000000000000000	
10000000000000000000000000000000	
00000000100000000000000000000000	
10000000000000000000000000000000	▼

Поле ввода символов:
а

Продолжить Другой

Вероятности:

q[1]	= 0,42
q[2]	= 0,14
q[3]	= 0,08
q[4]	= 0
q[5]	= 0,04
q[6]	= 0,06
q[7]	= 0,02
q[8]	= 0
q[9]	= 0,02
q[10]	= 0
q[11]	= 0
q[12]	= 0
q[13]	= 0,02
q[14]	= 0,04
q[15]	= 0
q[16]	= 0
q[17]	= 0
q[18]	= 0,02
q[19]	= 0,02
q[20]	= 0
q[21]	= 0,02
q[22]	= 0
q[23]	= 0
q[24]	= 0,02
q[25]	= 0
q[26]	= 0
q[27]	= 0
q[28]	= 0,02
q[29]	= 0,02
q[30]	= 0,02
q[31]	= 0,02
q[32]	= 0

Строка состояния:
Вы угадали. Для продолжения опыта нажмите "Продолжить", или "Другой" для выбора другого порядка

Произвольная часть текста:
атимся_к_обычным_человеческим_существам_я_надеюсь_что_вы_не_поймете_преврат

Использованные буквы:
м,

Порядок n-граммы:
5 символов
10 символов
15 символов
20 символов
25 символов
30 символов
35 символов
40 символов
45 символов
50 символов

Введенный символ: **л**

Символ по счету: **2**

Номер эксперимента: **50**

Неравенство для энтропии:
 $1,91633259251776 < H < 2,67380065575603$

Двоичная таблица угаданных символов:

10000000000000000000000000000000	▲
10000000000000000000000000000000	
01000000000000000000000000000000	
01000000000000000000000000000000	
10000000000000000000000000000000	▼

Поле ввода символов:
л

Продолжить Другой

Вероятности:

q[1]	= 0,5
q[2]	= 0,14
q[3]	= 0,04
q[4]	= 0,04
q[5]	= 0,06
q[6]	= 0,04
q[7]	= 0
q[8]	= 0
q[9]	= 0,02
q[10]	= 0,02
q[11]	= 0
q[12]	= 0
q[13]	= 0
q[14]	= 0
q[15]	= 0
q[16]	= 0
q[17]	= 0
q[18]	= 0
q[19]	= 0,02
q[20]	= 0,02
q[21]	= 0
q[22]	= 0,04
q[23]	= 0
q[24]	= 0
q[25]	= 0,02
q[26]	= 0
q[27]	= 0
q[28]	= 0
q[29]	= 0
q[30]	= 0
q[31]	= 0,02
q[32]	= 0,02

Строка состояния:
Вы угадали. Для продолжения опыта нажмите "Продолжить", или "Другой" для выбора другого порядка

[illegible]

Висновок:

У ході виконання комп'ютерного практикуму №1, я засвоїла поняття ентропії на символ джерела та його надлишковість, вивчила та порівняла різні моделі джерела відкритого тексту для наближеного визначення ентропії, набула практичних навичок щодо оцінки ентропії на символ джерела. Також я написала програму, завдяки якій можна підрахувати частоти, ентропію та надлишковість на прикладі тексту російською мовою.

