INTRODUCTION TO CRYPTOGRAPHY – LAB 3

B.Tech. Computer Science and Engineering (Cybersecurity)

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Batch: K2/A2	Date of performance: 12/12/2021

Aim: To perform cryptanalysis of the Vigenere cipher using Friedman test

Code:

Language: C

Editor: Atom

Compiler: clang/ZSH

```c
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <ctype.h>
char
cipher_text[]="tumvlpnzlteabgmjhalpcrpszbrmfhnqeaslntohyfjwjozuaatrllvpewllcgqfntumdpbrzlfaalklchzaaybnloofmooozewzeedwpnemulngugutuazvwrdwywrpsce
bvsuejauhlrawlnziausgzwhmczgkupbkhnqawyvvkwzdraannrlauajiqahnbypvramzeeakvlrkgutewdvvrzsjcrakaogpwprqilhafijlshtlsajmfmoekwteabazsbuwaizmkbnnjdltb
zwjoimjahrkgutrvlvfrtwjtewfpcpwetuaquhtvwfzfeweahrbwjhawdvglxjvvvlwyeimfpnemkwoaawaonkgbrgwjkeewjkuygsbtuwjpzrlohreifaifamldogsmeqmjhlwcvneswjlxnu
hseziffcbuebnvksaibvkzeedajefvgdeakjfpgkwytnqfjozumuipilpoaatfdrnsblgeaahgpwrelvwjefasyygwvlceghatumuvmzcfpcnbavnfagseygautumzhnqagmtumwudhawytuqk
hpctalsowlowumfahrlsaavaaumbbavnbdwyeymuarbvajnrbovrxagyagzwztbvsueymuarbvajdrdajevnloepwetuaquhtvwfzpewnpdrzazsrznldjqloajijyaabklexqfntuwklcbueb
nvksaibvkahrxjvvvlwycnvfvtczgciqmloeqilhbrksbsrqloaflwzitvwktumllcuvgsotgkbcubzhtvbuhnawlienkulsfmviynvqahvzvwaebqdeqwfvtuinlaagkplimjiuytwasnvvah
rlazchakpoaaoptuqfahrmplchbaceozsucuijlsgqdsoaogpntezplrbzlrrpsznbbqltomwuaqmupsvwfdhrbzlrgwklextwniftsaibvolmhaldoesoptukgugemkzialmztegsjaqmepcf
peqnhclojvucasudbbzlrfbgjrnnlhnnxhyonkzahnbskdemkzefidsosbzlmhtlppymuvmcmlpntkgucrzfztuiloaimtleabzlfbkmzosagtuppvlbnbwiugewjaaidsatzwltuildejqdsn
rmvvntwauguwflsgifkiangymrlhbbyqukeoillaowmahbetlsgbgwrbbwjtyqtlrggsudfmubrvbqpnowloohzdhwfifkohzllcuvgsotg";

//Procured from Lab2 code to get keyword equal to name
float
p[]={0.082,0.015,0.028,0.043,0.127,0.022,0.020,0.061,0.070,0.002,0.008,0.040,0.024,0.067,0.075,0.019,0.001,0.060,0.063,0.091,0.028,0.010,0.023,0.0
01,0.020,0.001};
char alphabet[]="abcdefghijklmnopqrstuvwxyz";
float* q[26];
float* Vg[26];
char* stringY[36];
float ioc[100];
float ioc_diff[100];
int keyword[10];

int findIndex(char n){
  for (int i = 0; i < 26; i++) {
    if(n==alphabet[i])
      return i;
  }
  return 0;
}

float IoC(char y_string[1300]){
  int temp[26]={0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0};
  int b = strlen(y_string);
  int sum=0;

  for (int i = 0; i<b; i++) {
    for (int j = 0; j < 27; j++) {
      if (y_string[i]==alphabet[j]) {
        temp[j]+=1;
      }
    }
  }
  for (int a = 0; a <26; a++) {
  }

```

```
    for (int i = 0; i < 26; i++) {
      if (temp[i]>0) {
        sum+=(temp[i]*(temp[i]-1));
      }
    }

    float ioc = (float) sum/(b*(b-1));
    printf("Index of coincidence: %f\n",ioc );
    return ioc;
  }


  int stringGenerator(int m){
    int key, k=0;
    char string_Y[1300];
    int w=0,z,p,count=0, l;
    for (int a = 1; a <= m; a++) {
      for (int i = 0; i < a; i++) {
        for (int j = i, k = 0; j < strlen(cipher_text); ) {
          string_Y[k]=cipher_text[j];
          j+=a,k++;
          l=k;
        }
        string_Y[l]='\0';
        printf("m=%d String %d \n",a, i+1);
        printf("%s\n",stringY[k]);
        k++;
        ioc[w]=IoC(string_Y);
        w++;
        count++;
      }
    }

    printf("\n\nEnter correct length of keyword to continue : ");
    scanf("%d", &key);
    return key;
  }

  int main() {
    int m;
    printf("Enter value of m: ");
    scanf("%d",&m);
    printf("\n" );

    int counter=0;
    int num=m;
    while (num!=0) {
      counter=counter+num;
      num--;
    }
```

```

    for (int i = 0; i < 36; i++) {
      stringY[i] = malloc(sizeof(char)*1300);
    }

      int z=0;
      for (int a = 1; a <= m; a++) {
        for (int i = 0; i < a; i++) {
          char* p=stringY[z];
          for (int j = i; j < strlen(cipher_text); ) {
            *p=cipher_text[j];
            j+=a,p++;
          }
          *p='\0';
        z++;
        }

      }

    int key=stringGenerator(m);

    counter=0;
    num=key;
    while (num!=0) {
      counter=counter+num;
      num--;
    }

    for (int i = 0; i < key; i++) {
      q[i] = malloc(sizeof(float)*26);
    }

    int string_counter=(counter-key);

    z=0;
    for (int a = 1; a <= key; a++) {
      int temp[26]={0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0};
      int b = strlen(stringY[string_counter]);
      float* arr=q[z];

      for (int i = 0; i < b; i++) {
        for (int j = 0; j < 27; j++) {
          if(stringY[string_counter][i]==alphabet[j]) {
            temp[j]+=1;
          continue;
        }
        }
    }
    for (int k = 0; k < 26; k++) {
      *arr=(float)temp[k]/b;
```

```
      arr++;
    }
      z++;
      string_counter++;
    }

    for (int i = 0; i < key; i++) {
      Vg[i] = malloc(sizeof(float)*26);
    }

    /*
  vg  0   1   2   3
  g=0 x   y   z   w   -> x = Sum of 26 vals use v_shift, sum it, input in vg
  g=1 x   y   z   w
  g=2 x   y   z   w
    */

    //creating the table

    z=0;
    int ind=0;
    for (int a = 1; a <= key; a++) {
      float* v=Vg[z];

      for (int g = 0; g < 26; g++) {
        float v_shift[26]={0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0};
        float v_sum=0;
        for (int i = 0; i < 26; i++) {
          v_shift[i]=q[ind][(i+g)%26];
          v_shift[i]=v_shift[i]*p[i];
          // printf("The q index : %d \t", ind );
          // printf("The i val: %d \t",i );
          // printf("The g val: %d \n", g);
          // printf("The index val: %d \t",(i+g) );
          // printf("The q array val: %f \t", q[ind][(i+g)%26]);
          // printf("The prod val: %f\n", v_shift[i]);
        }
        for (int i = 0; i < 26; i++) {
          v_sum+=v_shift[i];
        }
        *v=v_sum;
        v++;
      }
      z++;
      ind++;
    }

    //finding keyword

    for (int i = 0; i < key; i++) {
      // printf("\n\nVg for String %d V\n",i+1);
      float max=Vg[i][0];
      int max_i=0;
      for (int j = 0; j < 26; j++) {
        // printf("%f\n",Vg[i][j]);
        if (Vg[i][j]>max) {
          max=Vg[i][j];
          max_i=j;
        }
      }
      keyword[i]=max_i;
    }

    //print table

    printf("\nTable: \n");

    int index=0;

    printf("g \t Vg1 \t\t Vg2 \t\t Vg3 \t\t Vg4 \t\t Vg5\n" );
    for (int g = 0; g < 26; g++) {
      printf("%d \t %.4f \t %.4f \t %.4f \t %.4f \t %.4f\t\n",g, Vg[index][g],Vg[index+1][g],Vg[index+2][g],Vg[index+3][g],Vg[index+4][g]);
    }

    printf("\n\nKeyword: \n" );
    for (int i = 0; i < key; i++) {
      printf("%c", alphabet[keyword[i]]);
    }

    //decryption

        int temp;
        char new_txt[1300]="";
        char ch;

        for (int i=0,j=0;cipher_text[i]!='\0';i++,j++)
        {
            if(j==key)
              j=0;
            ch = cipher_text[i];
            int posn = findIndex(ch);
            int key_posn = keyword[j];
            temp = (posn - key_posn)%26;
            if (temp<0)
              temp= (26 - key_posn + posn);
            temp+='a';
            new_txt[i]= temp;
        }
        printf("\n\nThe plain text is: ");
        printf("%s", new_txt);

    return 0;
  }
```

Complete Output:

```
(base) anish@Anishs-MacBook-Pro Lab % clang vigenere.c -o vig
(base) anish@Anishs-MacBook-Pro Lab % ./vig
Enter value of m: 6

m=1 String 1
tumvlpnzlteabgmjhalpcrpszbrmfhnqeaslntohyfjwjozuaatrllvpewllcgqfntumdpbrzlfaalklchzaaybnloofmooozewzeedwpnemulngugutuazvwrdwywrpscebvsuejauhlrawlnziaus
gzwhmczgkupbkhnqawyvvkwzdraannrlauajiqahnbypvramzeeakvlrkgutewdvvrzsjcrakaogpwprqilhafijlshtlsajmfmoekwteabazsbuwaizmkbnnjdltbzwjoimjahrkgutrvlvfrtwjte
wfpcpwetuaquhtvwfzfeweahrbwjhawdvglxjvvvlwyeimfpnemkwoaawaonkgbrgwjkeewjkuygsbtuwjpzrlohreifaifamldogsmeqmjhlwcvneswjlxnuhseziffcbuebnvksaibvkzeedajefv
gdeakjfpgkwytnqfjozumuipilpoaatfdrnsblgeaahgpwrelvwjefasyygwvlceghatumuvmzcfpcnbavnfagseygautumzhnqagmtumwudhawytuqkhpctalsowlowumfahrlsaavaaumbbavnbdw
yeymuarbvajnrbovrxagyagzwztbvsueymuarbvajdrdajevnloepwetuaquhtvwfzpewnpdrzazsrznldjqloajijyaabklexqfntuwklcbuebnvksaibvkahrxjvvvlwycnvfvtczgciqmloeqilh
brksbsrqloaflwzitvwktumllcuvgsotgkbcubzhtvbuhnawlienkulsfmviynvqahvzvwaebqdeqwfvtuinlaagkplimjiuytwasnvvahrlazchakpoaaoptuqfahrmplchbaceozsucuijlsgqdso
aogpntezplrbzlrrpsznbbqltomwuaqmupsvwfdhrbzlrgwklextwniftsaibvolmhaldoesoptukgugemkzialmztegsjaqmepcfpeqnhclojvucasudbbzlrfbgjrnnlhnnxhyonkzahnbskdemkz
efidsosbzlmhtlppymuvmcmlpntkgucrzfztuiloaimtleabzlfbkmzosagtuppvlbnbwiugewjaaidsatzwltuildejqdsnrmvvntwauguwflsgifkiangymrlhbbyqukeoillaowmahbetlsgbgwr
bbwjtyqtlrggsudfmubrvbqpnowloohzdhwfifkohzllcuvgsotg
Index of coincidence: 0.043534
m=2 String 1
tmlnlebmhlcpzrfnesnoyjjzatlvelcqnudbzfakczablomozwedpeunuuuzwdyrsevujulalzaszhcgubhqwvkzranlujqhbprmeavrgtwvrscaagwrihfjstsjfoktaasuazknjlbwomargtvvrwt
wppeuqhvffwarwhwvljvlyifnmwawokbgjewkystwproriafmdgmqjlcnsjxuszfcubvsivzeaevdajpkynfouuploafrsleagwevjfsywlehtmvzfcbvfgeguuznamuwdayukptlolwmarsaaubband
yyurvjroraygwtvuyurvjraenopeuqhvfpwpraszljlaiyakeqnukcubvsivarjvlynftzcqleihrssqofwivkulcvstkcbhvunwinusminqhzweqewvunagpijutanvhlzhkoapufhmlhaezuujsqs
agneprzrpzbqtmuquswdrzrwlxwitabomadeotkuekilzesampfencovcsdblfgrnhnhokansdmzfdoblhlpmvclnkurftioiteblbmoatpvbbigwaistwtidjdnmvtagwlgfinyrhbqkolawabtsbw
bwtqlgsdmbvqnwohdwikhlcvst
Index of coincidence: 0.042183
m=2 String 2
uvpztagjaprsbmhqalthfwouarlpwlgftmprlallhaynofooezewnmlggtavrwwpcbseahrwniugwmzkpknayvwdanraaianyvazeklkuedvzjrkoppqlailhlammewebzbwimbndtzjijhkurlftje
fcwtautwzeehbjadgxvvwempekoaangrwkejugbujzlhefialosemhwvewlnheifbenkabkedjfgekfgwtqjzmiipatdnbgahprlweaygvcgauumcpnanasyatmhqgtmuhwtqhcaswoufhlavambvbw
emabanbvxgazzbsemabaddjvlewtautwzendzzrndqojjablxftwlbenkabkhxvvwcvvcgimoqlbkbrlalztwtmlugogbuztbhaleklfvyvavvabdqftilaklmiywsvaracapaotqarpcbcoscilgdo
optzlblrsnblowampvfhblgketnfsivlhlospuggmzamtgjqecpqhljuaubzrbjnlnxynzhbkekeisszmtpyummptgczzulamlazfkzsguplnwuejadazluleqsrvnwuufsikagmlbyueilomhelggr
bjytrgufurbpolozhffozlugog
Index of coincidence: 0.044959
m=3 String 1
tvntbjlrzmnanhjoarvwcfupzakhanoozzdnuguawwrcveurliswckbnwvzanajabvmevktdrjaowqhisljmkeabamndbjmhgrvttfptqtfeabhdlvlefewaoggkwusuplrfflgejwnwxhzfunsbzde
gafktfzuiotrbehwljayveammfnvaeauhatwhyqpaoomhsvubnwyavnoxyztsyavdavowuuvzwdarlqajalqtkbbkikrvlcfccmelrbqawtkmcgtbbtuaiksvnazaqqviakiitsvrzaoouamcaouisd
apelzrrzbtwqpwhzgltisblaoouumimejmcehousblbrlnykhseziozhpmmltuztlilbfmstpbwgjiawudqnvtuwsfaylbuolwhtgwbttgumrqoozwfhlvo
Index of coincidence: 0.043903
m=3 String 2
ulzeghppbfqstywzalplgnmblalzylfoeewelutzrypesjhanaghzukqykdaruihyrzalgevzckgpiajhsmowazuiknlzojruvfwepwuuvzwhwavxvwipmownbwejybwzoeaadsqhcejnsicevaveaf
dkpwnjuilafnlagrvesglgtuzpbngyumnguuatkclwwfraamabymrarvaawbumrarjneeahwpnrzzdljybefulunsbaxvwnvzilqhkslfzvtlusgczvhweufivhvedwtnapmuwnalckapqhphczcjgs
onzrlpnqoumsfrlwewfavmlepkgkazgaefqcjcubrgnhxoznkmedsltpucpkcfuomezbzauvnieadtliedrvwgfgknmhykiamblbrwylgduvpwodfkzcgt
Index of coincidence: 0.043414
m=3 String 3
mplamacsrhelofjutlelqtdrflcabomowepmnguvdwsbualwzuzmgphavwrnlaqnpaekruwvsraprlfltafetbswzbjtwiaktlrjwceahwferjwgjvymnkaakrjekgtjrhiimommlvsluefbbkikejv
ejgyqomppadsgapewfywchuvccafsgtzqmmdwuhtslualaabvdeubjbrggzveubjdelptqtfepzsnjoiakxnwcevavhjvyvtgqoibsroliwulvokuhbnlnlmyqvwbefulgljyavhahpatfrlbesulqo
gtpbrsblmauvdbrkxntiohdstgezltsqppnlvadzfjnnhnabdkfsbmlyvmngrziatalkogplbuwasztljsmnauliigrbqeloaesgbjqrsfbbnlhhiolusg
Index of coincidence: 0.043175
m=4 String 1
tllbhczfenyjalecndzacalmzepuuuwysvjllazcuhwkrnuqbrevgwrcawifssfkasakjboagvrtpeqvfawwlvyfmaobjwytpoifdmjcsxsfuvizavapyfupofsegejswetvfbfeuzaudyktowasabn
yuvrrywvyrjanpuhfwrslliaenkuviajlntclirsowvucskbvniumnhwqwuapjtnhzkauhlazussgerrzqmqsdzwxiaoaetukleapecvsbfrhhkndzdbhpvlkrtotbbotvbgaswijnvawgiyhqoaatb
btlsmvnodihcs
Index of coincidence: 0.042321
m=4 String 2
uptgarbhatfoalwgtpllhyooeenlgarwcsarnuwzpnywaraayaeludzroplihamwbbibdzihultectuwehjdxvepkanrkjguzhfaoehvwnefekbejgkgtjmiadbapleyvgumpaaythgmhthawuhaabb
eaabxazsmbdjlwatznzrdojbxtlekbhvwvciolkrazwmuobzbaelvvvadfialiwvrcpoqrccsigopzbrnlwmvhlktfillsugzmgqcqluuzbnnyzbeesztympgzualzksulweaallqrnufiambuiohlg
byruuboohfzuo
Index of coincidence: 0.045557
m=4 String 3
mnemlprnsojztvlqubfkzboowdenuzdreuuazshgbqvzaljhpmartvsagrhjtjotauznlwmrtvwwpuhfwrhvjlinwwkgekswrramgqlnjuzcbsveedjknoularlawvfylhmzcvggunmwaupllmrauad
yrjoagtuuvreoeqvppazjaykqucbsvrvyfzqehsqfiklvtchuwnsiqzeevngiuavlhopfmheujqanpzpbtuuwrrlwtbmdokeizsmfnocdlgnnoasmfollmcnufiielmapbiwittddmtglfnrbklwbsw
wqgdbqwhwklvt
Index of coincidence: 0.041270
m=4 String 4
vzajpsmqlhwurplfmralanfozwmgtvwpbehwigmkkavdnainvzkkevjkpqallmeezwmntjjkrfjfwatzebagvwmeoagweubjleilsmwelhibnakdfefwqziptnghrwagcaucnnsamqtuwqcsoflvmvw
mbnvgzbeaadvetuwedznqjalfwbnakxvcvgmqbbllttlgguthlkfyavbqtlkmysaaaatapbocldotllsboapfbgensvhopgmatjephjabrjlxnhkkismpumtczlmafzgpnujdzuesvwuskglyelmegr
jtgfrplzfolgg
Index of coincidence: 0.044404
m=5 String 1
tpejcbnlyotpctbacyooenntwweelnsmunvdnahveltvcorasaoesintohtftcutfhhgvenooreutzridelexecnieeeptoiodlheeyctmcnetntdtpswhamnernraterdeeutpdsdaaetcnihvctie
bsaitcoctnesyhaetalushcothcecsonlrntashreiimotgitacnjszglhzskdzlulgfltzmgvwwdwldvaffghulmtgwtsuqldflg
Index of coincidence: 0.055619
m=5 String 2
unahrrqnfzregurahbfzeegurrbjrzgcpqvrrjnrererrgqfhjeabznbirrrepaveralvieangeyurefoqwsnzbvbefagnzpargglfgeuznfyuquhucourvbbybrxgbybrvpaverrjjaxubvbrvncqq
rrftuutuvanfnvequaiynrhaurhougatrrboqvrgxfbheueaeqfhvuljhyakzslpvpuzollztlijsldsvulkybklalwjlubpohkls
```

```
Index of coincidence: 0.055524
m=5 String 3
mzbapmetjulwqmzlznmedmuadpvaaizzbakalibaakwzapiitmkbumjzmkvtwwqwwbwxlmmakwwgwliagmcwuiukvdvkkquianepvawgmcbagmamaqtwmlabdmvbazvmvdnwqwwzzqibqwukvxlvzmi
kqlvmvgbbwkmvzbwigmtvlaaqmbziqoebpbmmwbwttvaskmlgmpcudrrnohdeompmnctaefoubuaatenngsimbeahsrtrdrnowoco
Index of coincidence: 0.055809
m=5 String 4
vlglsfaowallfdlkalowwugzwssuwawgkwwaaqymkgdskwljlfwawkdwjglwfeufewdjwfkwgjjsjofmsjvjhfeskagjwfmltsawwsvhufagazgwwkalfsaawuaogwsuaaleufnanljkfkeskjwfgll
slwwlgkzuluvqvqfnkjwvakofpasjdgzzsqwufzkwsologkmseelcbfnnnnefshyctruiabspngatujrtugaryoobgbygfvohfhut
Index of coincidence: 0.059476
m=5 String 5
ltmpzhshjavlnpflaoozpluvycuhluhkhyznuapzvuvjaphlsmtzabljauvjpthzajvvypwabkkbphalmhnlsfbazjdfyjupfbarjylavpvsuhmuyhloaauvyajvyzuajjothzpzloylnlbaavyvcoh
bozklsbhhiliawdvlpiaazppalculspplzlupdllnaldpuzzjpqoabbnxkbmibtmmkzimbkapbeiziqmwwinlqiwebbqgmbwzizvg
Index of coincidence: 0.054765
m=6 String 1
tnblznnjavcuzkaozduuwrvulscbwznjbmvtrawhsjkaanbmgvtpqfahllfwogwsprfgjnxzuszeakfuorewjyemfveuawypomsunyvoytyvaouvwalaaqkbirlfcerqwkctbuisnzqvaitvzoumaus
aezztqwzlibaouiemeoslrnkszohmlutibmtbgiwdntwfybowtwtgmqowhv
Index of coincidence: 0.042789
m=6 String 2
uzgpbqtwapgmllyfewltrpshngzkydriyzlezkpahmwzinzjufewuzhaxwponwjbzeashenieaefkwjianareggupnymgutcwfambmavabmajeawnzdjbflnbxwviqklztugzhefvvdtamwacaqpccg
ozlnomflefvlpgageqjurnxzkestupcumzzunedlerwfkmyimlrygupofzg
Index of coincidence: 0.043108
m=6 String 3
mlmcreojteqdfcbmwpnudsulzzghvrlqperwsarftftszjwatrwehfrwjynakjktrimmlsufbievjyopasaefwhvcfgzmdutlaabdujrgvujepqfpsjiknccvvjytqisoiuvkhnnmqweugjahhafleuq
gprbmudrxtodtelspnvdfnhadfblvnritlopbwstjmalirqlasbqsbnhils
Index of coincidence: 0.039371
m=6 String 4
vtjrmahorwfpahnozngawceriwknvaaavekdjoqilmebmdjhrtfttebdveeagkuulflewwhfnbdgftzitbhlavamnaahthqaohvbwanxzsadvwuzdrqjltbkkvccmlbatmgbtakvaaqikisraoacoid
plrbwphgtsloummjchubblyheizpmtzllfspwjauqvusalulhgbturozflo
Index of coincidence: 0.044065
m=6 String 5
lehpfsyzllnbazloeeuzyejaahuqkauhragvcgijsoauklorvwpuvwwvvimwbeywoadqcjscvvadpnulflgvsltzbgunuaklwraayrrawurrnehprzlyeuusavnzlhsfvlscvwuihewnpunlkphhzjs
nrpqusrwwamekkzafccbghonmdlpckfoebaviatidvggnhkabbwldvwdkct
Index of coincidence: 0.044247
m=6 String 6
paashlfulltrlaooemgvwbawumpawnanakuvrpllaebwbtikljcawejgvmkaregjhiomvlebkkjegqmpdgpwycucastqmwhsulavebbgzebdltteznoaxweahvvgobrlwloubllyvbfllyvaptrbslo
tbslavbknihsgztqplazjnnbksmymgzaakgluazlsnuigbeoegjrfblhoug
Index of coincidence: 0.048941


Enter correct length of keyword to continue : 5

Table:
g        Vg1             Vg2             Vg3             Vg4             Vg5
0        0.0592          0.0434          0.0385          0.0391          0.0362
1        0.0388          0.0383          0.0344          0.0391          0.0385
2        0.0371          0.0391          0.0352          0.0400          0.0329
3        0.0335          0.0423          0.0362          0.0428          0.0385
4        0.0396          0.0367          0.0400          0.0355          0.0354
5        0.0340          0.0312          0.0326          0.0413          0.0337
6        0.0370          0.0388          0.0356          0.0389          0.0363
7        0.0392          0.0418          0.0413          0.0451          0.0585
8        0.0343          0.0341          0.0589          0.0360          0.0473
9        0.0358          0.0417          0.0401          0.0370          0.0359
10       0.0357          0.0337          0.0336          0.0326          0.0300
11       0.0479          0.0340          0.0324          0.0358          0.0415
12       0.0375          0.0392          0.0435          0.0367          0.0362
13       0.0399          0.0593          0.0364          0.0391          0.0375
14       0.0385          0.0371          0.0368          0.0444          0.0357
15       0.0468          0.0308          0.0365          0.0333          0.0353
16       0.0364          0.0390          0.0322          0.0328          0.0345
17       0.0352          0.0450          0.0345          0.0374          0.0364
18       0.0358          0.0347          0.0439          0.0615          0.0419
19       0.0393          0.0358          0.0457          0.0376          0.0400
20       0.0365          0.0369          0.0361          0.0339          0.0423
21       0.0354          0.0322          0.0402          0.0294          0.0407
22       0.0397          0.0370          0.0436          0.0467          0.0459
23       0.0326          0.0407          0.0393          0.0341          0.0418
24       0.0348          0.0415          0.0361          0.0365          0.0356
25       0.0404          0.0366          0.0374          0.0343          0.0326
[                                                                                ]
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Keyword:
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The plain text is: thedepartmentofjusticehasbeenandwillalwaysbecommittedtoprotectingthelibertyandsecurityofthosewhomweserveinrecentmonthshoweverwehaveo
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