const c =

'EELHLJNXJHUSYKUFTLWWQEHCUEELQZUFLQUUZOUHNMYPNFZIILOUHFRPNTGUURCGYUSCEOBUZFLODITAJGYPKVRWJISUWJZFNXGUT
IYUVGOLVPIRYGYTTYWUEDLKAUEXKCJSCQUBUMWTBNXGYPSNHYPNNFPFVYTSVSNGGVDXERFNMKJIELPZJEXKLMEVGUTMCVAFLPGYTOL
IBOGXGYPSNHYPNNOPUTYNZEELBDFINGUEIPKZJOHGPFVYTDVNXFAFNQGYEEHUVGOLVCPNXGYGRIPABBAGGPGYPZJEMQSMEHKUFULGT
IAORARUUTAJELXLSSITNUUHFIFHUPKFLNYLSDYPBNEOTLTTYNSVNABBTIWJLSNMEOJCEGUXILGBDHXKLBCBVLEIPKZJOHFLSSOGKGR
IPABLMXLSSNCLSKOPNCEXGULEHUPFDUUKFRZCSMDYTVTTZTVOTATVTSYHVMGYPMVELFHTLUPKIAVGUXILFKJEMFHSFHKJITAGZDHYJ
LODCGOBUJVZURYKANAWJAEEMHLJNXGZCEZKUEENVPDHHWYOOWJCJELUHHEMOHFRMEOFEHVMFRHVKJETGPUECNA';

```
const createFrequencyAnalysis = (cipherText, keyLength) => {
  const frequencies0bj = [];
  for (let i = 0; i < keyLength; i++) {</pre>
    frequenciesObj[i] = {};
    for (let j = 0; j < Math.floor(cipherText.length / keyLength); j++) {</pre>
      const char = cipherText[i + keyLength * j];
      frequenciesObj[i][char] = frequenciesObj[i][char] ? frequenciesObj[i][char] + 1 : 1;
    }
  }
  const frequencies = [];
  frequenciesObj.forEach((frequency) => {
    frequencies.push(Object.keys(frequency)
      .map((key) => [key, frequency[key]])
      .sort((a, b) \Rightarrow b[1] - a[1])
      map((e) => {
        e.push((e[1] / Object.values(frequency).reduce((acc, cur) => acc + cur, 0)) * 100);
        return e;
      }));
  });
  const maxCharAmount = frequencies.reduce((acc, cur) => Math.max(acc, cur.length), 0);
  frequencies.forEach((e) => {
    while (e.length < maxCharAmount) {</pre>
      e.push(['', 0, 0]);
    }
  });
  const masterFrequencies = [];
  for (let i = 0; i < maxCharAmount; i++) {</pre>
    masterFrequencies.push(
      frequencies
        .map((e) \implies e[i][2])
        .reduce((acc, cur) => acc + cur) / frequencies.length,
    );
  }
  console.log('Schlüssel der Länge', keyLength);
  console.log(masterFrequencies);
  console.log(frequencies);
};
// Grossbuchstaben: ASCII 65-90
const decrypt = (cipherText, key) => {
  let decrypted = '';
  let keyPosition = 0;
  for (let i = 0; i < cipherText.length; i++) {</pre>
    // console.log();
   // console.log(cipherText[i], cipherText.charCodeAt(i));
    // console.log(key[keyPosition], key.charCodeAt(keyPosition) - 65);
    let nextCode = cipherText.charCodeAt(i) - (key.charCodeAt(keyPosition) - 65);
    // console.log(nextCode);
    if (nextCode > 90) {
      nextCode -= 26;
    if (nextCode < 65) {</pre>
      nextCode += 26;
```

```
}
// console.log(nextCode);
// console.log(string.fromCharCode(nextCode));
decrypted += String.fromCharCode(nextCode);
keyPosition = (keyPosition + 1) % key.length;
}
console.log(decrypted);
};

// for (let i = 1; i <= 10; i++) {
// createFrequencyAnalysis(c, i);
// }

// createFrequencyAnalysis(c, 5);

decrypt(c, 'BAUCH');

/*</pre>

Version 1:
Cinhortoxt:
```

Ciphertext:

EEWHLODBCATECKUFTLWWQEHCUEEWQZUFLQUUZOUHNMYPNFZIILOUHFRPNTGUURCGYUSCEOBUZFLODITAJGYPKVRWJISUWJYFNXGUUI
YUVGOLVPIRYGYTTYWUEDLKAUEXKCJSCQUBUMWTBNXGYPSNHYPNNFPFVYTSVSNGGVDXERFNMKJIELPZJEXKLMEVGUTMCVAFLPGYTOLI
BOGXGYPSNHYPNNOPUTYNZEELBDFINGUEIPKZJOHFPFVYTDVNXFAFNQGYEEHUVGOLVBPNXGYGRIPAZBAGGPGYPZJEMQSMEHKUFULGTI
AORARUUTAJELXLSSITNUUHFIFHUPKFLNYLSDYPBNEOTLTTYNSVNABBTIWJLSNMEOJCEGUXILGADHXKLBCBVLEIPKZJOHFLSSOGKGRI
PABLMXLSSNCLSKOPNCEXGULEHUPFDUUKFRZCSMDYTVTTZTVPTATVTSYHVMGYPMVELFHTLUPKIAVGUXILFKJEMFHSFHKJITAGZDHYJL
ODCGOBUJVZURYKANAWJAEEMHLJNXGZCEZKUEENUPDHHWYOOWJCJELUHHEMOHFRMEOFEHVMFRHVKJETGPUECNA

Für verschiedene Schlüssel-Längen die Wahrscheinlichkeit aller Buchstaben des n-ten Zeichen des Schlüssels nehmen. Dann jeweils der Durschnitt der n-häufigsten Wahrscheinlichkeiten nehmen, sortieren und ausgeben:

```
Schlüssel der Länge 1
  7.226890756302522, 6.722689075630252,
  5.714285714285714, 5.546218487394958,
  5.042016806722689, 4.873949579831933,
  4.873949579831933, 4.873949579831933,
  4.705882352941177, 4.53781512605042,
  3.865546218487395, 3.865546218487395,
 3.5294117647058822, 3.5294117647058822,
 3.5294117647058822, 3.361344537815126,
  3.361344537815126, 2.857142857142857,
  2.857142857142857, 2.689075630252101,
 2.5210084033613445, 2.5210084033613445,
 2.1848739495798317, 2.1848739495798317,
 2.0168067226890756, 1.0084033613445378
Schlüssel der Länge 2
  7.239057239057239, 6.7340067340067336,
  5.892255892255893, 5.892255892255893,
  5.723905723905724, 5.218855218855218,
   5.0505050505050505, 5.05050505050505,
  4.377104377104377, 4.208754208754209,
  4.040404040404041, 3.872053872053872,
 3.7037037037037033, 3.7037037037037033,
 3.3670033670033668, 3.3670033670033668,
 3.030303030303030303, 2.6936026936026933,
 2.6936026936026933, 2.525252525252525,
  2.356902356902357, 2.1885521885521886,
```

```
2.0202020202020203, 2.0202020202020203,
 2.0202020202020203, 1.01010101010101
Schlüssel der Länge 3
  8.417508417508417, 6.228956228956229,
  5.892255892255892, 5.892255892255892,
  5.387205387205387, 5.387205387205387,
  5.05050505050505051, 4.882154882154882,
  4.377104377104377, 4.377104377104377,
 4.2087542087542085, 4.2087542087542085,
  3.872053872053872, 3.7037037037037037,
  3.535353535353535, 3.1986531986531985,
   3.0303030303030303, 2.8619528619528616,
  2.356902356902357, 2.356902356902357,
  2.356902356902357, 2.0202020202020203,
 2.0202020202020203, 2.0202020202020203,
 1.3468013468013467, 1.0101010101010102
Schlüssel der Länge 4
  8.108108108108109, 7.094594594594595,
  6.587837837837838,
  5.743243243243244, 5.405405405405405,
 5.0675675675675675, 4.5608108108108105,
 4.5608108108108105, 4.5608108108108105,
  4.391891891891892, 4.054054054054054,
  3.547297297297298, 3.3783783783783785,
 3.3783783783783785, 3.2094594594594597,
 3.0405405405405403, 2.871621621621622,
 2.7027027027027026, 2.5337837837837838,
  2.364864864864865, 2.027027027027027,
 1.8581081081081081, 1.3513513513513513,
 0.8445945945945945, 0.5067567567567568
Schlüssel der Länge 5
 16.302521008403364, 10.756302521008404,
  9.243697478991598, 8.403361344537815,
  7.394957983193278, 6.554621848739496,
                      5.378151260504202,
  6.050420168067227,
   4.53781512605042, 3.8655462184873954,
 3.5294117647058827, 3.361344537815126,
  3.025210084033614, 2.1848739495798317,
 1.8487394957983194, 1.680672268907563,
  1.680672268907563, 1.3445378151260505,
 1.0084033613445378, 1.0084033613445378,
 0.5042016806722689, 0.33613445378151263
Schlüssel der Länge 6
  8.754208754208754, 7.5757575757577,
  6.902356902356902, 6.060606060606061,
  5.55555555555556, 5.3872053872053876,
  4.882154882154882, 4.882154882154882,
  4.545454545454546, 4.2087542087542085,
  4.040404040404041, 3.8720538720538724,
 3.8720538720538724, 3.535353535353536,
  3.367003367003367, 3.198653198653199,
  3.198653198653199, 2.6936026936026938,
  2.356902356902357, 2.356902356902357,
 2.0202020202020203, 1.851851851851852,
```

```
1.6835016835016836, 1.5151515151515154,
 1.0101010101010102, 0.6734006734006734
Schlüssel der Länge 7
I
    9.91596638655462,
                       7.731092436974791,
   6.890756302521008, 6.386554621848739,
   6.218487394957983, 5.546218487394958,
  5.2100840336134455, 4.705882352941177,
   4.705882352941177, 4.537815126050421,
   4.201680672268908, 4.033613445378151,
  3.8655462184873945, 3.529411764705882,
   3.361344537815126, 3.025210084033614,
                      2.521008403361345,
   2.857142857142857,
   2.184873949579832, 1.8487394957983196,
  1.8487394957983196, 1.8487394957983196,
  1.3445378151260503, 1.1764705882352942,
 0.33613445378151263, 0.16806722689075632
Schlüssel der Länge 8
  9.966216216216218,
                      8.277027027027028,
                     6.587837837837838.
  7.263513513513514.
  6.081081081081081, 5.574324324324323,
  5.405405405405404, 5.0675675675675675,
  4.898648648648648, 4.72972972972973,
  4.054054054054055, 3.885135135135136,
                      3.378378378378378,
  3.885135135135136,
                     2.702702702702702,
  2.871621621621621.
 2.5337837837837833837, 2.5337837837837833,
 2.3648648648648645, 2.0270270270270268,
  1.689189189189189, 1.3513513513513513,
 1.1824324324324322, 1.0135135135135134,
 0.5067567567567568, 0.16891891891891891
Schlüssel der Länge 9
Γ
  10.26936026936027,
                      8.417508417508419.
                     6.565656565656567,
  7.744107744107745,
  6.060606060606061, 5.892255892255893,
                     5.05050505050505051,
  5.892255892255893,
 4.7138047138047146, 4.545454545454546,
  4.377104377104377, 3.703703703703704,
  3.198653198653199, 3.0303030303030307,
 3.0303030303030307, 2.8619528619528625,
 2.8619528619528625, 2.1885521885521886,
  1.851851851851852, 1.5151515151515154,
 1.5151515151515154, 1.5151515151515154,
 1.3468013468013469, 1.0101010101010102,
 0.6734006734006734, 0.16835016835016836
Schlüssel der Länge 10
I
 16.779661016949152, 11.35593220338983,
 10.169491525423728, 8.47457627118644,
  7.288135593220336, 6.949152542372879,
  5.762711864406779, 5.254237288135593,
  4.745762711864407, 4.237288135593221,
 3.8983050847457625, 3.2203389830508464,
   2.71186440677966, 2.5423728813559316,
 2.0338983050847452, 1.6949152542372876,
   1.35593220338983, 1.0169491525423726,
```

```
0.3389830508474576, 0.1694915254237288
1
=> Schlüssel der Länge 5.
Wahrscheinlichkeiten der Buchstaben bei Schlüssellänge 5
(der Buchstaben, die jeweils mit dem n-ten Buchstaben des Schlüssels verschlüsselt werden.):
Format: [Zeichen im ciphertext, Anzahl Vorkommnisse, Anteil am Text]
[
   [ 'F', 17, 14.285714285714285 ],
    [ 'J', 12, 10.084033613445378 ],
   ['U', 10, 8.403361344537815],
    [ 'E', 9, 7.563025210084033 ],
    ['T', 9, 7.563025210084033],
   ['P', 8, 6.722689075630252],
    ['S', 8, 6.722689075630252],
   [ '0', 6, 5.042016806722689 ],
   ['B', 6, 5.042016806722689],
   ['V', 6, 5.042016806722689],
   ['I', 5, 4.201680672268908],
   ['G', 4, 3.361344537815126],
   [ 'M', 4, 3.361344537815126 ],
   ['N', 3, 2.5210084033613445],
   ['D', 3, 2.5210084033613445],
   [ 'X', 2, 1.680672268907563 ],
    ['C', 2, 1.680672268907563],
   ['0', 1, 0.8403361344537815],
   [ 'Z', 1, 0.8403361344537815 ],
    [ 'R', 1, 0.8403361344537815 ],
   ['L', 1, 0.8403361344537815],
   [ 'H', 1, 0.8403361344537815 ]
 ],
   ['E', 26, 21.84873949579832],
    [ 'N', 12, 10.084033613445378 ],
    [ 'R', 9, 7.563025210084033 ],
   ['S', 9, 7.563025210084033],
   ['D', 8, 6.722689075630252],
    ['U', 8, 6.722689075630252],
   ['T', 7, 5.88235294117647],
   ['I', 7, 5.88235294117647],
    [ '0', 6, 5.042016806722689 ],
   ['G', 4, 3.361344537815126],
   ['L', 4, 3.361344537815126],
   ['H', 4, 3.361344537815126],
   ['A', 3, 2.5210084033613445],
   [ 'F', 2, 1.680672268907563 ],
    ['Z', 2, 1.680672268907563],
   ['M', 2, 1.680672268907563],
   ['V', 2, 1.680672268907563],
   ['C', 2, 1.680672268907563],
    [ 'B', 1, 0.8403361344537815 ],
    [ 'K', 1, 0.8403361344537815 ],
   [ '', 0, 0 ],
    ['', 0, 0]
 ],
```

['Y', 16, 13.445378151260504], ['L', 14, 11.76470588235294],

```
[ 'H', 12, 10.084033613445378 ],
  [ 'X', 11, 9.243697478991598 ],
   'M', 9, 7.563025210084033 ],
  [ 'N', 9, 7.563025210084033 ],
  ['W', 7, 5.88235294117647],
    'C', 7, 5.88235294117647 ],
  [ '0', 5, 4.201680672268908 ],
 ['I', 5, 4.201680672268908],
   'Z', 4, 3.361344537815126 ],
  [ 'A', 4, 3.361344537815126 ],
   'U', 4, 3.361344537815126 ],
   'P', 3, 2.5210084033613445 ],
   'B', 2, 1.680672268907563 ],
  ['T', 2, 1.680672268907563],
  [ 'V', 2, 1.680672268907563 ],
  ['0', 1, 0.8403361344537815],
  [ 'E', 1, 0.8403361344537815 ],
 ['J', 1, 0.8403361344537815],
  [ '', 0, 0 ],
  ['', 0, 0]
],
 [ 'G', 23, 19.327731092436977 ],
 [ 'K', 12, 10.084033613445378 ],
  ['P', 11, 9.243697478991598],
  [ 'F', 10, 8.403361344537815 ],
 ['T', 9, 7.563025210084033],
 ['U', 7, 5.88235294117647],
   'V', 7, 5.88235294117647 ],
 ['J', 6, 5.042016806722689],
 [ 'H', 5, 4.201680672268908 ],
   'C', 4, 3.361344537815126 ],
  ['W', 4, 3.361344537815126 ],
 ['0', 4, 3.361344537815126],
  ['E', 4, 3.361344537815126],
  ['N', 3, 2.5210084033613445],
 ['I', 2, 1.680672268907563],
  [ '0', 2, 1.680672268907563 ],
  [ 'B', 2, 1.680672268907563 ],
 [ 'X', 2, 1.680672268907563 ],
  [ 'R', 1, 0.8403361344537815 ],
  [ 'Y', 1, 0.8403361344537815 ],
 ['', 0, 0],
  ['', 0, 0]
],
 [ 'L', 15, 12.605042016806722 ],
  ['U', 14, 11.76470588235294],
  [ 'A', 13, 10.92436974789916 ],
   'Y', 11, 9.243697478991598 ],
   'Z', 9, 7.563025210084033 1,
  [ 'K', 7, 5.88235294117647 ],
  [ 'P', 7, 5.88235294117647 ],
   'V', 6, 5.042016806722689 1,
  ['H', 5, 4.201680672268908],
  [ '0', 4, 3.361344537815126 ],
  ['S', 4, 3.361344537815126],
 [ 'B', 4, 3.361344537815126 ],
 ['N', 3, 2.5210084033613445],
 [ 'R', 2, 1.680672268907563 ],
  ['I', 2, 1.680672268907563],
 ['C', 2, 1.680672268907563],
```

```
[ 'T', 2, 1.680672268907563 ],
    [ 'G', 2, 1.680672268907563 ],
    [ 'J', 2, 1.680672268907563 ],
    [ 'D', 2, 1.680672268907563 ],
    [ 'M', 2, 1.680672268907563 ],
    [ 'W', 1, 0.8403361344537815 ]
]
]
=> Verschiebungen um [1, 0, 20, 2, 7]
=> Schlüssel: BAUCH.
=> Klartext:
```

DECFENDHATSEIINETRUPPENANDECOSTFRONTZUSAMMENGEZOGENUNDKONZENTRIERTSICHAUFDENDORTIGENDURCHBRUCHREN DENTIESOFORTIHREERSTEUNDDRITTEDIVISIONAUSUMANDEROSTFRONTDIEVERLUSTEZUDDCKENSICHERNSIEDIE LEBENSMITTELVERSORGUNGDEROSTFRONTMITTELSDERZWEITENDIVISIONDIEVERWUNDDTENWERDENSOFORTUONDERFRONT YBGEZOGENSIESOLLENINEUREMHAUPTQUARTIERVERSORGTUNDBEHANDELTWERDENUMEURESTELLUNGZUSICHERNSCHICKEN WIRETCHDIEACHTEDIVISIONDERSUEDFRONTALSVERSTAERKUNGBEDENKENSIEDASDERFALLDEROSTFROOTGROSSEFOLGEN FUERDASLANDHABENWIRDDIESDARFNICHTGESCHEHENDIEHAUPTSTREITMACHTDESFEINDESBEFINDETSICHNURNOCH VIERSAGESMAERSCHEENTFERNTDIEZEITEILT

/* Version 2:

Ciphertext:

EELHLJNXJHUSYKUFTLWWQEHCUEELQZUFLQUUZOUHNMYPNFZIILOUHFRPNTGUURCGYUSCEOBUZFLODITAJGYPKVRWJISUWJZFNXGUTI
YUVGOLVPIRYGYTTYWUEDLKAUEXKCJSCQUBUMWTBNXGYPSNHYPNNFPFVYTSVSNGGVDXERFNMKJIELPZJEXKLMEVGUTMCVAFLPGYTOLI
BOGXGYPSNHYPNNOPUTYNZEELBDFINGUEIPKZJOHGPFVYTDVNXFAFNQGYEEHUVGOLVCPNXGYGRIPABBAGGPGYPZJEMQSMEHKUFULGTI
AORARUUTAJELXLSSITNUUHFIFHUPKFLNYLSDYPBNEOTLTTYNSVNABBTIWJLSNMEOJCEGUXILGBDHXKLBCBVLEIPKZJOHFLSSOGKGRI
PABLMXLSSNCLSKOPNCEXGULEHUPFDUUKFRZCSMDYTVTTZTVOTATVTSYHVMGYPMVELFHTLUPKIAVGUXILFKJEMFHSFHKJITAGZDHYJL
ODCGOBUJVZURYKANAWJAEEMHLJNXGZCEZKUEENVPDHHWYOOWJCJELUHHEMOHFRMEOFEHVMFRHVKJETGPUECNA

```
Schlüssel der Länge 1
 7.0588235294117645, 6.5546218487394965,
  6.050420168067227, 5.714285714285714,
 5.2100840336134455, 4.873949579831933,
  4.705882352941177, 4.705882352941177,
  4.705882352941177, 4.705882352941177,
  4.033613445378151, 3.865546218487395,
  3.865546218487395, 3.697478991596639,
 3.5294117647058822, 3.361344537815126,
 3.0252100840336134, 2.857142857142857,
  2.689075630252101, 2.689075630252101,
  2.689075630252101, 2.5210084033613445,
 2.1848739495798317, 2.0168067226890756,
  1.680672268907563, 1.0084033613445378
Schlüssel der Länge 2
  7.239057239057239, 6.7340067340067336,
 6.0606060606060606, 5.723905723905724,
  5.723905723905724, 5.387205387205387,
  5.218855218855218, 5.05050505050505,
  4.545454545454545, 4.208754208754209,
  4.040404040404041, 3.872053872053872,
 3.7037037037037033, 3.7037037037037033,
  3.535353535353535, 3.1986531986531985,
 2.8619528619528616, 2.6936026936026933,
 2.6936026936026933, 2.6936026936026933,
```

```
2.1885521885521886, 2.1885521885521886,
 2.0202020202020203, 2.0202020202020203,
 1.6835016835016834, 1.01010101010101
Schlüssel der Länge 3
   8.24915824915825, 6.565656565656565,
  5.892255892255892, 5.5555555555555545,
 5.218855218855219, 4.882154882154882,
  4.545454545454546, 4.377104377104377,
  4.377104377104377, 4.040404040404041,
  3.3670033670033668, 3.03030303030303,
   3.0303030303030303, 2.6936026936026933,
 2.6936026936026933, 2.356902356902357,
  2.356902356902357, 2.1885521885521886,
 2.0202020202020203, 1.8518518518518519,
 1.1784511784511784, 1.0101010101010102
Schlüssel der Länge 4
 7.9391891891891895, 7.094594594594595,
  6.925675675675676,
  5.574324324324325, 5.574324324324325,
  5.236486486486487, 4.5608108108108105,
 4.5608108108108105, 4.391891891891892,
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