1. Сформировать список, состоящий из строчных символов русского алфавита. Определите среднее значение кодов этих символов в кодировке UNICODE. Ответ округлить до меньшего целого.

```
In[*]:= alphChar = CharacterRange["a", "я"]
    charCode = ToCharacterCode[StringJoin[alphChar]]
    charSum = Sum[charCode[i], {i, 1, Length[charCode]}]
    charSrednee = N[charSum / Length[charCode]]
```

2. Найти два простых числа, ближайших к 7920, меньших 7920. Определить произведение этих

чисел по модулю 134

```
In[=]:= chislo = 7920
    prost1 = NextPrime[chislo, -1]
    prost2 = NextPrime[chislo, -2]
    proizvedenie = Mod[prost1 * prost2, 134]
```

3. Переведите число 4 D73F3, представленное в шестнадцатеричной форме, в десятичную и определите число разрядов .

```
chislo3 = BaseForm[16^^4D73F3, 10]
IntegerLength[chislo3]
```

4. Создайте два списка чисел: Первый в диапазоне от 1 до 54, второй - от 200 до 1365, затем

объедините оба списка . В отсортированном объединенном списке при начальном значении

генератора псевдослучайных чисел, равном 418463498, было выбрано два случайных значения . Определите номера позиций найденных элементов в отсортированном списке и найдите

произведение номеров позиции.

```
Initial = Range[1, 54]
list42 = Range[200, 1365]
list4 = Union[list41, list42]
list4 = Sort[list4]
SeedRandom[418 463 498]
random1 = RandomChoice[list4, 1]
random2 = RandomChoice[list4, 1]
listNum1 = Position[list4, Min[random1]]
listNum2 = Position[list4, Min[random2]]
proizv4 = listNum1 * listNum2
```

5. Импортировать файл textrpl . txt из папки ФО КЗЗ1 . Исключить из текста все символы, кроме

строчных и прописных букв русского алфавита. Преобразовать полученный список в матрицу

размерностью 6 х157. В столбцах с 53 по 102 провести замену замену строчных букв на прописные. Определить сумму кодов элементов матрицы.

 $\mathit{ln[*]}:=$ text="И как этот же самый лес хорош поздней осенью , когда прилетают вальдшнепы ! Они не держатся в самой глуши : их надобно искать вдоль опушки . Ветра нет, и нет ни солнца , ни света, ни тени, ни движенья , ни шума; в мягком воздухе разлит осенний запах, подобный запаху вина; тонкий туман стоит вдали над желтыми полями . Сквозь обнаженные , бурые сучья деревьев мирно белеет неподвижное небо; кое-где на липах висят последние золотые листья . Сырая земля упруга под ногами ; высокие сухие былинки не шевелятся ; длинные нити блестят на побледневшей траве. Спокойно дышит грудь, а на душу находит странная тревога . Идешь вдоль опушки , глядишь за собакой , а между тем любимые образы , любимые лица, мертвые и живые , приходят на память , давным -давно заснувшие впечатления неожиданно просыпаются ; воображенье реет и носится , как птица, и всё так ясно движется и стоит перед глазами . Сердце то вдруг задрожит и забьется , страстно бросится вперед , то безвозвратно потонет в воспоминаниях . Вся жизнь развертывается легко и быстро , как свиток ; всем своим прошедшим , всеми чувствами , силами , всею своею душою владеет человек . И ничего кругом ему не мешает – ни солнца нет, ни ветра, ни шуму" alhpa5 = CharacterRange["A", "Я"] textForMatr = StringCases[text, alhpa5] matr = Partition[textForMatr, 157] matr1 = matr For $[i = 1, i \le 6, i++,$ For $[j = 42, j \le 136, j++, matr1[[i, j]] = ToUpperCase[matr1[[i, j]]]]$ matr1 // TableForm textmatr = StringJoin[matr1] kodmatr = ToCharacterCode[textmatr] Total[kodmatr]

6. Известно, что начальное состояние генератора случайных чисел установлено как

Было сформировано 32 случайных простых чисел в диапазоне 5643 - 39501. Определите сумму

последних 5 - ти (значит в цикле вычитаем 4) сформированных чисел

```
In[•]:= SeedRandom [24 059 307]
    list6 = RandomPrime[{5643, 39501}, 32]
    For[i6 = Length[list6] - 4, i6 ≤ Length[list6], i6++, sum6 = sum6 + list6[i6]]
    sum6
```

7. Сформировать множество целых чисел из интервала[56, 119] и множество простых чисел из

интервала[82, 127]. Найти произведение элементов, принадлежащих обоим множествам. Если

множества не пересекаются, ввести ответ: 0

```
In[•]:= list71 = Range[56, 119]
    min72 = 82
    max72 = 127
    If[PrimeQ[min72], t1 = PrimePi[min72], t1 = PrimePi[min72] + 1]
    t2 = PrimePi[max72]
    list72 = Table[Prime[x], {x, t1, t2}]
    listM = Intersection[list71, list72]
    lenList = Length[listM]
    mult = 1
    For[j = 1, j ≤ lenList, j++, mult *= listM[[j]]]
    mult
```

8. Определить количество простых чисел, меньших или равных 5373

```
ln[-]:= r81 = 0
    r82 = 5373
    listR = Table[s, {s, r81, r82}]
    If[PrimeQ[r81], beforeR81 = PrimePi[r81] - 1, beforeR81 = PrimePi[r81]]
    beforeR82 = PrimePi[r82]
    cont = beforeR82 - beforeR81
```

9. Получить список из первых 1849 нечетных чисел . Сформировать из списка квадратную матрицу. Провести последовательно следующие операции: поменять местами строки 5 и 42; циклически сдвинуть 14 - ю строку на 63 позиций вправо . Поменять местами столбцы 18 и

циклически сдвинуть 19 - й столбец на 61 позиций вниз . Рассчитать сумму элементов главной

диагонали.

```
In[•]:= list9 = {}
    lengthList9 = 900
    i9 = 0
    While [Length[list9] ≤ lengthList9 - 1,
     If[Mod[i9, 2] == 1, AppendTo[list9, i9]] x
      i9++]
    list9 = Partition[list9, Sqrt[lengthList9]]
    Dimensions[list9]
```

```
Out[ ]= 900
Out[ • ]= 0
29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59},
      {61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93,
       95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119},
      {121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149,
       151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179},
      {181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209,
       211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239},
      {241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269,
       271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299},
      {301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329,
       331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359},
      {361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389,
       391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419},
      {421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 445, 447, 449,
       451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479},
      {481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509,
       511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539},
      {541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569,
       571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599},
      {601, 603, 605, 607, 609, 611, 613, 615, 617, 619, 621, 623, 625, 627, 629,
       631, 633, 635, 637, 639, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659},
      {661, 663, 665, 667, 669, 671, 673, 675, 677, 679, 681, 683, 685, 687, 689,
       691, 693, 695, 697, 699, 701, 703, 705, 707, 709, 711, 713, 715, 717, 719},
      {721, 723, 725, 727, 729, 731, 733, 735, 737, 739, 741, 743, 745, 747, 749,
       751, 753, 755, 757, 759, 761, 763, 765, 767, 769, 771, 773, 775, 777, 779},
      {781, 783, 785, 787, 789, 791, 793, 795, 797, 799, 801, 803, 805, 807, 809,
       811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839}
      {841, 843, 845, 847, 849, 851, 853, 855, 857, 859, 861, 863, 865, 867, 869,
       871, 873, 875, 877, 879, 881, 883, 885, 887, 889, 891, 893, 895, 897, 899},
      {901, 903, 905, 907, 909, 911, 913, 915, 917, 919, 921, 923, 925, 927, 929,
       931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959}
      {961, 963, 965, 967, 969, 971, 973, 975, 977, 979, 981, 983, 985, 987, 989, 991,
       993, 995, 997, 999, 1001, 1003, 1005, 1007, 1009, 1011, 1013, 1015, 1017, 1019},
      {1021, 1023, 1025, 1027, 1029, 1031, 1033, 1035, 1037, 1039, 1041, 1043,
       1045, 1047, 1049, 1051, 1053, 1055, 1057, 1059, 1061, 1063, 1065, 1067,
       1069, 1071, 1073, 1075, 1077, 1079}, {1081, 1083, 1085, 1087, 1089, 1091,
       1093, 1095, 1097, 1099, 1101, 1103, 1105, 1107, 1109, 1111, 1113, 1115,
       1117, 1119, 1121, 1123, 1125, 1127, 1129, 1131, 1133, 1135, 1137, 1139
      {1141, 1143, 1145, 1147, 1149, 1151, 1153, 1155, 1157, 1159, 1161, 1163,
       1165, 1167, 1169, 1171, 1173, 1175, 1177, 1179, 1181, 1183, 1185, 1187,
       1189, 1191, 1193, 1195, 1197, 1199}, {1201, 1203, 1205, 1207, 1209, 1211,
       1213, 1215, 1217, 1219, 1221, 1223, 1225, 1227, 1229, 1231, 1233, 1235,
       1237, 1239, 1241, 1243, 1245, 1247, 1249, 1251, 1253, 1255, 1257, 1259},
```

```
{1261, 1263, 1265, 1267, 1269, 1271, 1273, 1275, 1277, 1279, 1281, 1283,
                   1285, 1287, 1289, 1291, 1293, 1295, 1297, 1299, 1301, 1303, 1305, 1307,
                   1309, 1311, 1313, 1315, 1317, 1319}, {1321, 1323, 1325, 1327, 1329, 1331,
                   1333, 1335, 1337, 1339, 1341, 1343, 1345, 1347, 1349, 1351, 1353, 1355,
                   1357, 1359, 1361, 1363, 1365, 1367, 1369, 1371, 1373, 1375, 1377, 1379},
                 {1381, 1383, 1385, 1387, 1389, 1391, 1393, 1395, 1397, 1399, 1401, 1403,
                   1405, 1407, 1409, 1411, 1413, 1415, 1417, 1419, 1421, 1423, 1425, 1427,
                   1429, 1431, 1433, 1435, 1437, 1439}, {1441, 1443, 1445, 1447, 1449, 1451,
                   1453, 1455, 1457, 1459, 1461, 1463, 1465, 1467, 1469, 1471, 1473, 1475,
                   1477, 1479, 1481, 1483, 1485, 1487, 1489, 1491, 1493, 1495, 1497, 1499},
                 {1501, 1503, 1505, 1507, 1509, 1511, 1513, 1515, 1517, 1519, 1521, 1523,
                   1525, 1527, 1529, 1531, 1533, 1535, 1537, 1539, 1541, 1543, 1545, 1547,
                   1549, 1551, 1553, 1555, 1557, 1559}, {1561, 1563, 1565, 1567, 1569, 1571,
                   1573, 1575, 1577, 1579, 1581, 1583, 1585, 1587, 1589, 1591, 1593, 1595,
                   1597, 1599, 1601, 1603, 1605, 1607, 1609, 1611, 1613, 1615, 1617, 1619}
                 {1621, 1623, 1625, 1627, 1629, 1631, 1633, 1635, 1637, 1639,
                   1641, 1643, 1645, 1647, 1649, 1651, 1653, 1655, 1657, 1659,
                   1661, 1663, 1665, 1667, 1669, 1671, 1673, 1675, 1677, 1679},
                 {1681, 1683, 1685, 1687, 1689, 1691, 1693, 1695, 1697, 1699,
                   1701, 1703, 1705, 1707, 1709, 1711, 1713, 1715, 1717, 1719,
                   1721, 1723, 1725, 1727, 1729, 1731, 1733, 1735, 1737, 1739},
                 {1741, 1743, 1745, 1747, 1749, 1751, 1753, 1755, 1757, 1759,
                   1761, 1763, 1765, 1767, 1769, 1771, 1773, 1775, 1777, 1779,
                   1781, 1783, 1785, 1787, 1789, 1791, 1793, 1795, 1797, 1799}}
Out[\bullet] = \{30, 30\}
                Поменять местами строки 5 (swapistr91) и 42 (swapistr92):
 In[*]:= swapistr91 = 26
             swapistr92 = 16
             row1 = list9[swapistr91]
             list9[swapistr91] = list9[swapistr92]
             list9[swapistr92] = row1
Out[ ]= 26
Out[ • ]= 16
Out[\circ] = \{1501, 1503, 1505, 1507, 1509, 1511, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 
                1519, 1521, 1523, 1525, 1527, 1529, 1531, 1533, 1535, 1537,
                1539, 1541, 1543, 1545, 1547, 1549, 1551, 1553, 1555, 1557, 1559}
931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959}
Out[\circ] = \{1501, 1503, 1505, 1507, 1509, 1511, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1513, 1515, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 1517, 
                1519, 1521, 1523, 1525, 1527, 1529, 1531, 1533, 1535, 1537,
                1539, 1541, 1543, 1545, 1547, 1549, 1551, 1553, 1555, 1557, 1559}
```

In[*]:= sdvigstr91 = 3 goRight9 = 80

Циклически сдвинуть 14 - ю строку (sdvigstr91) на 63 позиций вправо (goRight9) :

```
sdvigRow91 = list9[[14]]
    sdvigRow91 = RotateRight[sdvigRow91, goRight9]
    list9[14] = sdvigRow91
Out[•]= 3
Out[ = 80
811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839}
831, 833, 835, 837, 839, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799}
831, 833, 835, 837, 839, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799}
     Поменять местами столбцы 18 (swapStolb91) и 40 (swapStolb92). Для этого транспонируем
     матрицы, обработаем и поставим обратно:
In[•]:= swapStolb91 = 13
    swapStolb92 = 11
    list9Copy = list9
    list9Copy = Transpose[list9Copy]
    swapRow91 = list9Copy[swapStolb91]
    list9Copy[swapStolb91] = list9Copy[swapStolb92]
    list9Copy[swapStolb92] = swapRow91
    list9Copy = Transpose[list9Copy]
    list9 = list9Copy
Out[•]= 13
Out[•]= 11
Out[\bullet] = \{\{1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, \}
      29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59},
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Рассчитать сумму элементов главной диагонали:

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ln[\bullet] := sum91 = 0
     For[i9 = 1, i9 ≤ Sqrt[lengthList9], i9++, sum91 = sum91 + list9[i9, i9]]
     sum91
Out[ • ]= 0
Out[ ]= 26 540
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10. Определить число простых чисел, содержащихся в интервале[281, 6730].

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chislo101 = 281
chislo102 = 6730
If[PrimeQ[chislo101], t1 = PrimePi[chislo101], t1 = PrimePi[chislo101] + 1]
t2 = PrimePi[chislo102]
list102 = Table[Prime[x], {x, t1, t2}]
Length[list102]
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