

Kodas:

```
4 import math
5 from itertools import combinations as comb
6 from reverseMod_6LD import getGCD
7
8 def getPrimeFactors(n):
9     i = 2
10    factors = []
11    while i * i <= n:
12        if n % i:
13            i += 1
14        else:
15            n //= i
16            factors.append(i)
17    if n > 1:
18        factors.append(n)
19    return factors
20
21 def getPossibleCipherExponents(value1):
22     possibleCipherExponents = []
23     n = value1
24
25     possibleDivisorPairs = getPrimeFactors(n)
26     fi = n - possibleDivisorPairs[0] - possibleDivisorPairs[1] + 1
27     for i in range(2, fi + 1):
28         if getGCD(i, fi)[0] == 1:
29             possibleCipherExponents.append(i)
30
31     return possibleCipherExponents
```

Išvedimas:

```
n = 299
print("")
print(getPrimeFactors(n))
print (getPossibleCipherExponents(n))

n = 221
print("")
print(getPrimeFactors(n))
print (getPossibleCipherExponents(n))

n = 323
print("")
print(getPrimeFactors(n))
print (getPossibleCipherExponents(n))

n = 391
print("")
print(getPrimeFactors(n))
print (getPossibleCipherExponents(n))

n = 667
print("")
print(getPrimeFactors(n))
print (getPossibleCipherExponents(n))
```

Pirmiausiai išbandžiau algoritmą su jūsų duotu moduliu 299, bet kadangi tai pakankamai lengva išbandžiau ir pavaizdavau visus kitus skaidrėse prie užduočių duotus modulius.

Rezultatai (modulių faktoriai ir visos įmanomos exponentės pagal duotą modulį):

Kai $n = 299$:

[13, 23]

[5, 7, 13, 17, 19, 23, 25, 29, 31, 35, 37, 41, 43, 47, 49, 53, 59, 61, 65, 67, 71, 73, 79, 83, 85, 89, 91, 95, 97, 101, 103, 107, 109, 113, 115, 119, 121, 125, 127, 131, 133, 137, 139, 143, 145, 149, 151, 155, 157, 161, 163, 167, 169, 173, 175, 179, 181, 185, 187, 191, 193, 197, 199, 203, 205, 211, 215, 217, 221, 223, 227, 229, 233, 235, 239, 241, 245, 247, 251, 255, 259, 263]

Kai $n = 221, 323, 391, 667$:

[13, 17]

[5, 7, 11, 13, 17, 19, 23, 25, 29, 31, 35, 37, 41, 43, 47, 49, 53, 55, 59, 61, 65, 67, 71, 73, 77, 79, 83, 85, 89, 91, 95, 97, 101, 103, 107, 109, 113, 115, 119, 121, 125, 127, 131, 133, 137, 139, 143, 145, 149, 151, 155, 157, 161, 163, 167, 169, 173, 175, 179, 181, 185, 187, 191, 193, 197, 199, 203, 205, 209, 211, 215, 217, 221, 223, 227, 229, 233, 235, 239, 241, 245, 247, 251, 253, 257, 259, 263, 265, 269, 271, 275, 277, 281, 283, 287]

[17, 19]

[5, 7, 11, 13, 17, 19, 23, 25, 29, 31, 35, 37, 41, 43, 47, 49, 53, 55, 59, 61, 65, 67, 71, 73, 77, 79, 83, 85, 89, 91, 95, 97, 101, 103, 107, 109, 113, 115, 119, 121, 125, 127, 131, 133, 137, 139, 143, 145, 149, 151, 155, 157, 161, 163, 167, 169, 173, 175, 179, 181, 185, 187, 191, 193, 197, 199, 203, 205, 209, 211, 215, 217, 221, 223, 227, 229, 233, 235, 239, 241, 245, 247, 251, 253, 257, 259, 263, 265, 269, 271, 275, 277, 281, 283, 287]

[17, 23]

[3, 5, 7, 9, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 343, 345, 347, 349, 351]

[23, 29]

[3, 5, 9, 13, 15, 17, 19, 23, 25, 27, 29, 31, 37, 39, 41, 43, 45, 47, 51, 53, 57, 59, 61, 65, 67, 69, 71, 73, 75, 79, 81, 83, 85, 87, 89, 93, 95, 97, 101, 103, 107, 109, 111, 113, 115, 117, 123, 125, 127, 129, 131, 135, 137, 139, 141, 145, 149, 151, 153, 155, 157, 159, 163, 167, 169, 171, 173, 177, 179, 181, 183, 185, 191, 193, 195, 197, 199, 201, 205, 207, 211, 213, 215, 219, 221, 223, 225, 227, 229, 233, 235, 237, 239, 241, 243, 247, 249, 251, 255, 257, 261, 263, 265, 267, 269, 271, 277, 279, 281, 283, 285, 289, 291, 293, 295, 299, 303, 305, 307, 309, 311, 313, 317, 321, 323, 325, 327, 331, 333, 335, 337, 339, 345, 347, 349, 351, 353, 355, 359, 361, 365, 367, 369, 373, 375, 377, 379, 381, 383, 387, 389, 391, 393, 395, 397, 401, 403, 405, 409, 411, 415, 417, 419, 421, 423, 425, 431, 433, 435, 437, 439, 443, 445, 447, 449, 453, 457, 459, 461, 463, 465, 467, 471, 475, 477, 479, 481, 485, 487, 489, 491, 493, 499, 501, 503, 505, 507, 509, 513, 515, 519, 521, 523, 527, 529, 531, 533, 535, 537, 541, 543, 545, 547, 549, 551, 555, 557, 559, 563, 565, 569, 571, 573, 575, 577, 579, 585, 587, 589, 591, 593, 597, 599, 601, 603, 607, 611, 613, 615]