

```
ClearAll[fpF]
```

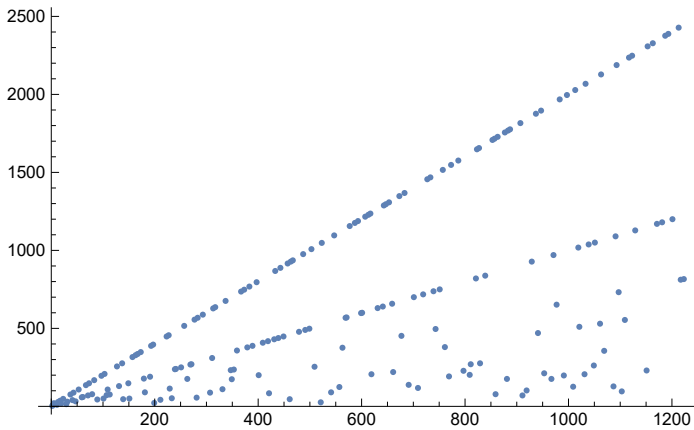
```
fpF =
```

```
Block[{i = 1}, While[i < Length@# && PadRight[#[[ ; i]], Length@#, "Periodic"] ≠ #, i++];  
i] &;
```

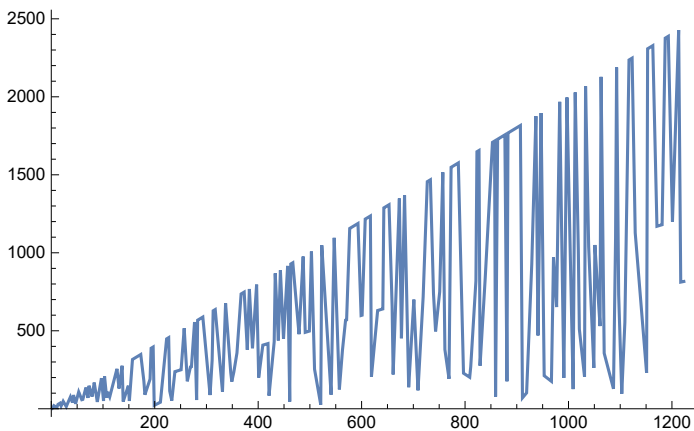
```
(*asal sayi vs periyod*) list2 = Partition[Riffle[Prime[#] &@Range[200], fpF@# & /@  
(Mod[Join[{0}, Fibonacci[#] & /@Range[10000]], #] & /@Prime[#] &@Range[200])], 2]
```

```
{ {2, 3}, {3, 8}, {5, 20}, {7, 16}, {11, 10}, {13, 28}, {17, 36}, {19, 18}, {23, 48},  
{29, 14}, {31, 30}, {37, 76}, {41, 40}, {43, 88}, {47, 32}, {53, 108}, {59, 58},  
{61, 60}, {67, 136}, {71, 70}, {73, 148}, {79, 78}, {83, 168}, {89, 44}, {97, 196},  
{101, 50}, {103, 208}, {107, 72}, {109, 108}, {113, 76}, {127, 256}, {131, 130},  
{137, 276}, {139, 46}, {149, 148}, {151, 50}, {157, 316}, {163, 328}, {167, 336},  
{173, 348}, {179, 178}, {181, 90}, {191, 190}, {193, 388}, {197, 396}, {199, 22},  
{211, 42}, {223, 448}, {227, 456}, {229, 114}, {233, 52}, {239, 238}, {241, 240},  
{251, 250}, {257, 516}, {263, 176}, {269, 268}, {271, 270}, {277, 556}, {281, 56},  
{283, 568}, {293, 588}, {307, 88}, {311, 310}, {313, 628}, {317, 636}, {331, 110},  
{337, 676}, {347, 232}, {349, 174}, {353, 236}, {359, 358}, {367, 736}, {373, 748},  
{379, 378}, {383, 768}, {389, 388}, {397, 796}, {401, 200}, {409, 408}, {419, 418},  
{421, 84}, {431, 430}, {433, 868}, {439, 438}, {443, 888}, {449, 448}, {457, 916},  
{461, 46}, {463, 928}, {467, 936}, {479, 478}, {487, 976}, {491, 490}, {499, 498},  
{503, 1008}, {509, 254}, {521, 26}, {523, 1048}, {541, 90}, {547, 1096}, {557, 124},  
{563, 376}, {569, 568}, {571, 570}, {577, 1156}, {587, 1176}, {593, 1188}, {599, 598},  
{601, 600}, {607, 1216}, {613, 1228}, {617, 1236}, {619, 206}, {631, 630}, {641, 640},  
{643, 1288}, {647, 1296}, {653, 1308}, {659, 658}, {661, 220}, {673, 1348},  
{677, 452}, {683, 1368}, {691, 138}, {701, 700}, {709, 118}, {719, 718}, {727, 1456},  
{733, 1468}, {739, 738}, {743, 496}, {751, 750}, {757, 1516}, {761, 380}, {769, 192},  
{773, 1548}, {787, 1576}, {797, 228}, {809, 202}, {811, 270}, {821, 820}, {823, 1648},  
{827, 1656}, {829, 276}, {839, 838}, {853, 1708}, {857, 1716}, {859, 78}, {863, 1728},  
{877, 1756}, {881, 176}, {883, 1768}, {887, 1776}, {907, 1816}, {911, 70}, {919, 102},  
{929, 928}, {937, 1876}, {941, 470}, {947, 1896}, {953, 212}, {967, 176}, {971, 970},  
{977, 652}, {983, 1968}, {991, 198}, {997, 1996}, {1009, 126}, {1013, 2028},  
{1019, 1018}, {1021, 510}, {1031, 206}, {1033, 2068}, {1039, 1038}, {1049, 262},  
{1051, 1050}, {1061, 530}, {1063, 2128}, {1069, 356}, {1087, 128}, {1091, 1090},  
{1093, 2188}, {1097, 732}, {1103, 96}, {1109, 554}, {1117, 2236}, {1123, 2248},  
{1129, 1128}, {1151, 230}, {1153, 2308}, {1163, 2328}, {1171, 1170}, {1181, 1180},  
{1187, 2376}, {1193, 2388}, {1201, 1200}, {1213, 2428}, {1217, 812}, {1223, 816}
```

ListPlot@list2



ListLinePlot@list2



(*sonu 1 veya 9 ile biten asal sayilar*)

```
p19 = list3 = FromDigits /@ Cases[IntegerDigits /@ Prime[#] &@Range[200], {_, 1 | 9}]
```

```
{11, 19, 29, 31, 41, 59, 61, 71, 79, 89, 101, 109, 131, 139, 149, 151, 179, 181,
 191, 199, 211, 229, 239, 241, 251, 269, 271, 281, 311, 331, 349, 359, 379, 389,
 401, 409, 419, 421, 431, 439, 449, 461, 479, 491, 499, 509, 521, 541, 569, 571,
 599, 601, 619, 631, 641, 659, 661, 691, 701, 709, 719, 739, 751, 761, 769, 809,
 811, 821, 829, 839, 859, 881, 911, 919, 929, 941, 971, 991, 1009, 1019, 1021,
 1031, 1039, 1049, 1051, 1061, 1069, 1091, 1109, 1129, 1151, 1171, 1181, 1201}
```

(*sonu 1 veya 9 ile biten asal sayilarin periyodlari*)

```
period19 = fpF@# & /@ (Mod[Join[{0}, Fibonacci[#] &@Range[10000]], #] &@list3)
```

```
{10, 18, 14, 30, 40, 58, 60, 70, 78, 44, 50, 108, 130, 46, 148, 50, 178, 90, 190, 22, 42, 114,
 238, 240, 250, 268, 270, 56, 310, 110, 174, 358, 378, 388, 200, 408, 418, 84, 430, 438, 448,
 46, 478, 490, 498, 254, 26, 90, 568, 570, 598, 600, 206, 630, 640, 658, 220, 138, 700, 118,
 718, 738, 750, 380, 192, 202, 270, 820, 276, 838, 78, 176, 70, 102, 928, 470, 970, 198,
 126, 1018, 510, 206, 1038, 262, 1050, 530, 356, 1090, 554, 1128, 230, 1170, 1180, 1200}
```

(*periyod p-1'i boluyor*)

p19 - 1

period19

{1, 1, 2, 1, 1, 1, 1, 1, 1, 2, 2, 1, 1, 3, 1, 3, 1, 2, 1, 9, 5, 2, 1, 1, 1, 1, 1, 5, 1, 3, 2, 1, 1, 1, 2, 1, 1, 5, 1, 1, 1, 10, 1, 1, 1, 2, 20, 6, 1, 1, 1, 1, 3, 1, 1, 1, 3, 5, 1, 6, 1, 1, 1, 2, 4, 4, 3, 1, 3, 1, 11, 5, 13, 9, 1, 2, 1, 5, 8, 1, 2, 5, 1, 4, 1, 2, 3, 1, 2, 1, 5, 1, 1, 1}

(*sonu 3 veya 7 ile biten asal sayilar*)

p37 = list3 = FromDigits /@Cases[IntegerDigits /@Prime[#] &@Range[200], {_, 3 | 7}]

{13, 17, 23, 37, 43, 47, 53, 67, 73, 83, 97, 103, 107, 113, 127, 137, 157, 163, 167, 173, 193, 197, 223, 227, 233, 257, 263, 277, 283, 293, 307, 313, 317, 337, 347, 353, 367, 373, 383, 397, 433, 443, 457, 463, 467, 487, 503, 523, 547, 557, 563, 577, 587, 593, 607, 613, 617, 643, 647, 653, 673, 677, 683, 727, 733, 743, 757, 773, 787, 797, 823, 827, 853, 857, 863, 877, 883, 887, 907, 937, 947, 953, 967, 977, 983, 997, 1013, 1033, 1063, 1087, 1093, 1097, 1103, 1117, 1123, 1153, 1163, 1187, 1193, 1213, 1217, 1223}

(*sonu 3 veya 7 ile biten asal sayilarin periyodlari*)

period37 = fpF@# & /@ (Mod[Join[{0}, Fibonacci[#] &@Range[10000]], #] & /@list3)

{28, 36, 48, 76, 88, 32, 108, 136, 148, 168, 196, 208, 72, 76, 256, 276, 316, 328, 336, 348, 388, 396, 448, 456, 52, 516, 176, 556, 568, 588, 88, 628, 636, 676, 232, 236, 736, 748, 768, 796, 868, 888, 916, 928, 936, 976, 1008, 1048, 1096, 124, 376, 1156, 1176, 1188, 1216, 1228, 1236, 1288, 1296, 1308, 1348, 452, 1368, 1456, 1468, 496, 1516, 1548, 1576, 228, 1648, 1656, 1708, 1716, 1728, 1756, 1768, 1776, 1816, 1876, 1896, 212, 176, 652, 1968, 1996, 2028, 2068, 2128, 128, 2188, 732, 96, 2236, 2248, 2308, 2328, 2376, 2388, 2428, 812, 816}

(*periyod p-1'i bolmuyor*)

p37 - 1

period37

{ $\frac{3}{7}, \frac{4}{9}, \frac{11}{24}, \frac{9}{19}, \frac{21}{44}, \frac{23}{16}, \frac{13}{27}, \frac{33}{68}, \frac{18}{37}, \frac{41}{84}, \frac{24}{49}, \frac{51}{104}, \frac{53}{36}, \frac{28}{19}, \frac{63}{128}, \frac{34}{69}, \frac{39}{79}, \frac{81}{164}, \frac{83}{168}, \frac{43}{87}, \frac{48}{97}, \frac{49}{99}, \frac{111}{224}, \frac{113}{228}, \frac{58}{13}, \frac{64}{129}, \frac{131}{88}, \frac{69}{139}, \frac{141}{284}, \frac{73}{147}, \frac{153}{44}, \frac{78}{157}, \frac{79}{79}, \frac{84}{159}, \frac{173}{251}, \frac{88}{261}, \frac{183}{273}, \frac{93}{139}, \frac{191}{281}, \frac{99}{144}, \frac{108}{293}, \frac{221}{148}, \frac{114}{303}, \frac{231}{153}, \frac{233}{154}, \frac{243}{321}, \frac{243}{323}, \frac{243}{163}, 504, 524, 548, 31, 188, 289, 588, 297, 608, 307, 309, 644, 648, 327, 168, 169, 341, 363, 183, 371, 189, 193, 393, 199, 411, 413, 213, 214, 337, 113, 684, 728, 367, 248, 379, 387, 788, 57, 824, 828, 427, 429, 431, 219, 441, 443, 453, 234, 473, 238, 483, 244, 491, 249, 253, 258, 864, 439, 884, 888, 908, 469, 948, 53, 88, 163, 984, 499, 507, 517, 531, 543, 273, 274, 551, 279, 561, 288, 581, 593, 298, 303, 304, 611, 1064, 64, 547, 183, 48, 559, 1124, 577, 1164, 1188, 597, 607, 203, 408}$ }

(*periyod p^2-1 'i boluyor*)

$p37^2 - 1$

period37

{6, 8, 11, 18, 21, 69, 26, 33, 36, 41, 48, 51, 159, 168, 63, 68, 78, 81, 83, 86, 96, 98, 111, 113, 1044, 128, 393, 138, 141, 146, 1071, 156, 158, 168, 519, 528, 183, 186, 191, 198, 216, 221, 228, 231, 233, 243, 251, 261, 273, 2502, 843, 288, 293, 296, 303, 306, 308, 321, 323, 326, 336, 1014, 341, 363, 366, 1113, 378, 386, 393, 2786, 411, 413, 426, 428, 431, 438, 441, 443, 453, 468, 473, 4284, 5313, 1464, 491, 498, 506, 516, 531, 9231, 546, 1644, 12673, 558, 561, 576, 581, 593, 596, 606, 1824, 1833}