A definit pattern among prime counting position

By Luis Felipe Massena Misiec

Would you like to see an interesting relationship? If I replace the variable of any polynomial with a prime number and obtain the remainder of the division by certain small numbers, I can obtain several series of combined results that are specific to each prime number. If I do the same with integers and consider only the series obtained by a particular prime number, for example 104729, I can verify that the counting of prime numbers with the same sequence occurs in such a way that if I count how many primes there are up to the given prime number among the integers... the quantity found will be exactly equal to how many times this series of remainders is true among the series of primes that are also equal to this specific series, and consider that the position with which these series of remainders have as a position among the series counted among the primes is completely random and yet when I count the number of times that the series of remainders appears in the group of integers, it gives exactly the position of the position of the prime number in particular.

```
nn=Range[1,10000000]

n=Select[nn,PrimeQ,(2000)]

n2=Select[nn,IntegerQ,(500)]

k=(n^2)-1+(n)+(2-4n)

d=n^4-1+n^2

c=n^3+2

e=Mod[c,3]

f=Mod[d,3]

g=Mod[k,3]

h=Mod[c,7]

i=Mod[d,7]

j=Mod[k,7]

l=Mod[c,4]

m=Mod[d,4]

o=Mod[k,4]

r=Mod[c,5]

s=Mod[d,5]

t=Mod[k,5]
```

```
QQ=Transpose[{e,f,g,h,i,j,l,m,o,r,s,t}]
n2=104729
k1=(n2^2)-1+(n2)+(2-4n2)
d1=n2^4-1+n2^2
c1=n2^3+2
e1=Mod[c1,3]
f1=Mod[d1,3]
g1=Mod[k1,3]
h1=Mod[c1,7]
i1=Mod[d1,7]
j1=Mod[k1,7]
l1=Mod[c1,4]
m1=Mod[d1,4]
o1=Mod[k1,4]
r1=Mod[c1,5]
s1=Mod[d1,5]
t1=Mod[k1,5]
QQ=Transpose[{e,f,g,h,i,j,l,m,o,r,s,t}]
a={e1,f1,g1,h1,i1,j1,l1,m1,o1,r1,s1,t1}
existeSublista = MemberQ[QQ,a]
Position[QQ,a]
n2=Select[nn,IntegerQ,(104729)]
k1=(n2^2)-1+(n2)+(2-4n2)
d1=n2^4-1+n2^2
c1=n2^3+2
e1=Mod[c1,3]
f1=Mod[d1,3]
g1=Mod[k1,3]
h1=Mod[c1,7]
i1=Mod[d1,7]
j1=Mod[k1,7]
```

```
l1=Mod[c1,4]

m1=Mod[d1,4]

o1=Mod[k1,4]

r1=Mod[c1,5]

s1=Mod[d1,5]

t1=Mod[k1,5]

QQ=Transpose[{e,f,g,h,i,j,l,m,o,r,s,t}]

qq=Transpose[{e1,f1,g1,h1,i1,j1,l1,m1,o1,r1,s1,t1}]

existeSublista = MemberQ[qq,a]

gh=Position[qq,a]

jh=Flatten[gh]

Differences[%]

Length[%]

bg=PrimeQ[gh]

Count[jh, _?PrimeQ]

{1,1,2,3,5,6,3,1,3,1,1,0}

True

{{35},{104},{223},{442},{545},{594},{691},{786},{837},{884},{1115},{1341},{1385},{1427},{1473},{1653},{1782},{1914},{2041},{2208},{2249},{2377},{2421},{2508},{2633},{2719},{2796},{2879},{3000},{3081},{3165},{3283},{3321},{3404},{3441},{3526},{3568},{3613},{3694},{3849},{3973},{4128},{4364},{4451},{4494},{4604},{4793},{4833},{4868},{4908},{4949},{4983},{5026},{5148},{5185},{5219},{5413},{5639},{5685},{5808},{5843},{5884},{6001},{6077},{6182},{6332},{6599},{6631},{6709},{6858},{6966},{7004},{7042},{7086},{7347},{7422},{7651},{7870},{7908},{7983},{8060},{8099},{8350},{8385},{8493},{8638},{9051},{9089},{9128},{9279},{9313},{9350},{9419},{9452},{9487},{9564},{9600},{9747},{9857},{9921},{9961},{10000}}

{{True},{True},{False},{True},{False},{False},{False},{True},{False},{True},{True},{False},{True},{False},{True},{True},{True},{False},{False},{False},{False},{True},{False},{False},{False},{False},{True},{True},{True},{True},{False},{False},{False},{True},{False},{False},{True},{False},{False},{True},{False},{False},{True},{False},{False},{False},{True},{True},{False},{False},{True},{True},{False},{True},{False},{False},{True},{False},{True},{False},{True},{False},{True},{False},{False},{True},{False},{True},{False},{True},{False},{False},{True},{True},{False},{True},{True},{False},{True},{True},{True},{False},{True},{False},{False},{False},{True},{False},{False},{True},{False},{False},{False},{True},{False},{False},{False},{False},{False},{True},{False},{True},{True},{False},{False},{True},{False},{False},{False},{False},{True},{True},{True},{True},{True},{True},{True},{False},{False},{True},{True},{True},{False},{False},{False},{False},{True},{False},{False},{False},{False},{False},{True},{True},{False},{False},{True},{True},{True},{False},{False},{True},{False},{True},{False},{False},{True},{False},{Fal
```

se},{False},{True},{False},{False},{False},{False},{False},{False},{True},{True},{False},{True},{False}
,{False},{False},{True},{False},{False},{True},{True},{True},{True},{False},{False},{False},{False},{F
alse},{False},{True},{False},{True},{False},{False},{False},{False},{False},{True},{False},{False},{Fal
se},{False},{False},{True},{True},{False},{True},{False},{True},{True},{False},{False},{False},{False},
{False},{False},{True},{True},{False},{False},{True},{False},{False},{False},{True},{False},{False},{Fa
lse},{False},{False},{False},{False},{False},{False},{False},{True},{True},{True},{False},{False},{Fals
e},{True},{True},{True},{False},{True},{True},{True},{False},{True},{True},{False},{False},{False},{T
rue},{False},{False},{True},{False},{True},{True},{True}}

102

A second example:

nn=Range[1,10000000]

n=Select[nn,PrimeQ,(2500)]

n2=Select[nn,IntegerQ,(500)]

k=(n^2)-1+(n)+(2-4n)

d=n^4-1+n^2

c=n^3+2

e=Mod[c,3]

f=Mod[d,3]

g=Mod[k,3]

h=Mod[c,7]

i=Mod[d,7]

j=Mod[k,7]

l=Mod[c,4]

m=Mod[d,4]

o=Mod[k,4]

r=Mod[c,5]

s=Mod[d,5]

t=Mod[k,5]

QQ=Transpose[{e,f,g,h,i,j,l,m,o,r,s,t}]

n2=16931

k1=(n2^2)-1+(n2)+(2-4n2)

d1=n2^4-1+n2^2

```
c1=n2^3+2
e1=Mod[c1,3]
f1=Mod[d1,3]
g1=Mod[k1,3]
h1=Mod[c1,7]
i1=Mod[d1,7]
j1=Mod[k1,7]
l1=Mod[c1,4]
m1=Mod[d1,4]
o1=Mod[k1,4]
r1=Mod[c1,5]
s1=Mod[d1,5]
t1=Mod[k1,5]
QQ=Transpose[{e,f,g,h,i,j,l,m,o,r,s,t}]
a={e1,f1,g1,h1,i1,j1,l1,m1,o1,r1,s1,t1}
existeSublista = MemberQ[QQ,a]
Position[QQ,a]
n2=Select[nn,IntegerQ,(16931)]
k1=(n2^2)-1+(n2)+(2-4n2)
d1=n2^4-1+n2^2
c1=n2^3+2
e1=Mod[c1,3]
f1=Mod[d1,3]
g1=Mod[k1,3]
h1=Mod[c1,7]
i1=Mod[d1,7]
j1=Mod[k1,7]
l1=Mod[c1,4]
m1=Mod[d1,4]
o1=Mod[k1,4]
r1=Mod[c1,5]
```

```
s1=Mod[d1,5]

t1=Mod[k1,5]

QQ=Transpose[{e,f,g,h,i,j,l,m,o,r,s,t}]

qq=Transpose[{e1,f1,g1,h1,i1,j1,l1,m1,o1,r1,s1,t1}]

existeSublista = MemberQ[qq,a]

gh=Position[qq,a]

jh=Flatten[gh]

Differences[%]

Length[%]

bg=PrimeQ[gh]

Count[jh, _?PrimeQ]
```

```
{1,1,2,1,5,4,1,1,1,3,1,4}

True

{{32},{164},{280},{488},{541},{640},{689},{738},{785},{976},{1020},{1113},{1159},{1208},{1253},{1297},{1383},{1564},{1689},{1738},{1829},{1873},{1953},{1995},{2084},{2162}}

{{131},{551},{971},{1391},{1811},{2231},{2651},{3071},{3491},{3911},{4331},{4751},{5171},{5591},{6011},{6431},{6851},{7271},{7691},{8111},{8531},{8951},{9371},{9791},{10211},{10631},{11051},{11471},{11891},{12311},{12731},{13151},{13571},{13991},{14411},{14831},{15251},{15671},{16091},{16511},{16931}}

{{True},{False},{True},{False},{True},{False},{False},{False},{True},{True},{False},{True},{True},{True},{True},{False},{False},{False},{True},{True},{False},{True},{True},{True},{True},{True},{False},{True},{False},{False},{False},{True},{False},{False},{True},{True},{False},{True},{True},{False},{True}}

23
```

If you count the positions of “qq” in “a”, and consider only the ones that are prime numbers or positions that are prime numbers, and count in yellow it will arrive to the 23rd place which gives the counting of the prime number 16931, it wil Always count right and it reveals a deep pattern within the polynomials properties that show that the chaotic nature of the distribution of the series , in this particular case {1,1,2,1,5,4,1,1,1,3,1,4}, that is the finger print for 16931,will reveal a counting property of the prime number amidst integers and amidst prime numbers them selves that alows for precision counting a prime number position without using all the primes until that position but only sorted out numbers with specific positions.

List a is the position for the fingerprint of 16931 (the 1953rd prime) in the sublists of primes and list b is the position for the fingerprint of 17389 (the 2000th prime) in the sublists of primes. 420 is the difference of the positions of the fingerprints in the list of integers s shown in blue above...What a suprise when we graph the ocurrence of those different positions shown in the graphs below:

a={{32},{164},{280},{488},{541},{640},{689},{738},{785},{976},{1020},{1113},{1159},{1208},{1253},{1297},{1383},{1564},{1689},{1738},{1829},{1873},{1953},{1995},{2084},{2162}}

420/a

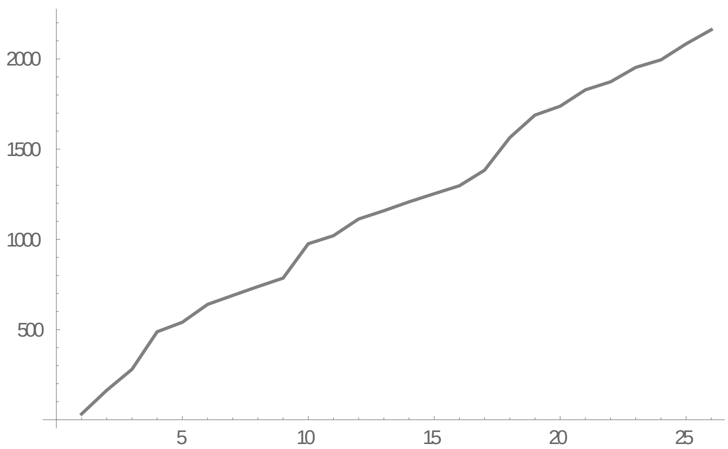
b={{169},{226},{337},{391},{443},{493},{644},{693},{839},{932},{1212},{1655},{1695},{1742},{1786},{2000},{2089},{2165},{2212},{2337},{2380},{2424}}

420/b

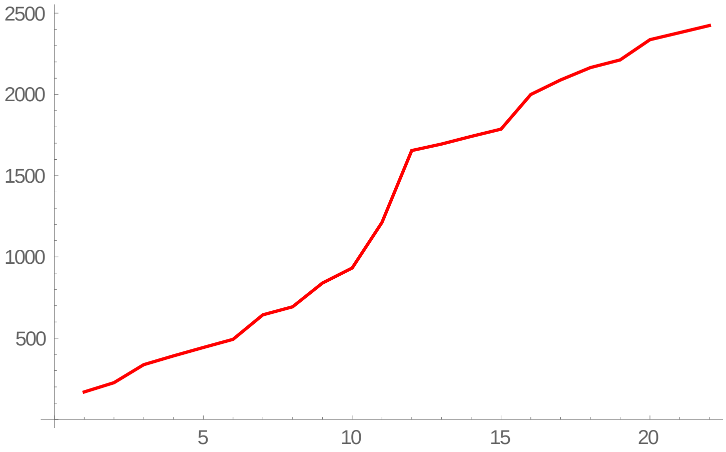
h=ListLinePlot [Flatten[b],PlotStyle->Gray]

j=ListLinePlot [Flatten[b],PlotStyle->Red]

Show[h,j]



h)

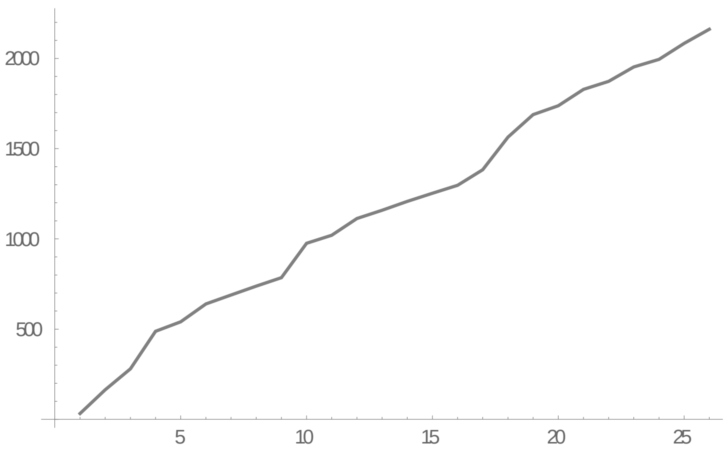


j)

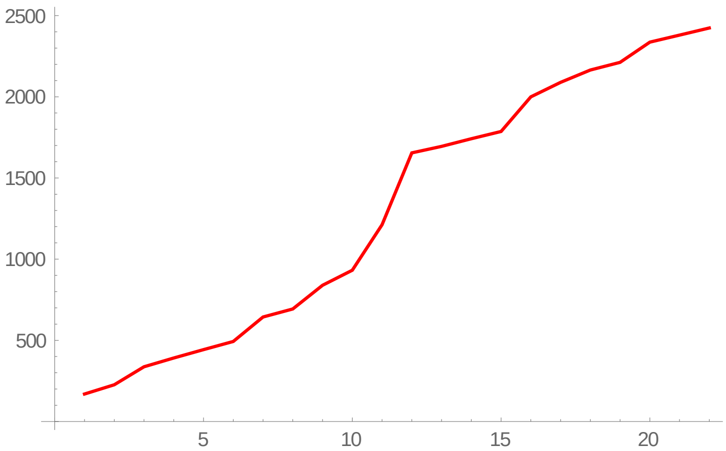
a={{32},{164},{280},{488},{541},{640},{689},{738},{785},{976},{1020},{1113},{1159},{1208},{1253},{1297},{1383},{1564},{1689},{1738},{1829},{1873},{1953},{1995},{2084},{2162}}
420/a
b={{169},{226},{337},{391},{443},{493},{644},{693},{839},{932},{1212},{1655},{1695},{1742},{1786},{2000},{2089},{2165},{2212},{2337},{2380},{2424}}
420/b
c={{72},{256},{309},{364},{417},{463},{519},{570},{712},{858},{909},{950},{1000},{1320},{1364},{1404},{1452},{1497},{1543},{1632},{1715},{1893},{1976},{2021},{2147},{2184},{2355}}
420/c

h=ListLinePlot [Flatten[a],PlotStyle->Gray]
j=ListLinePlot [Flatten[b],PlotStyle->Red]
k=ListLinePlot [Flatten[c],PlotStyle->Blue]

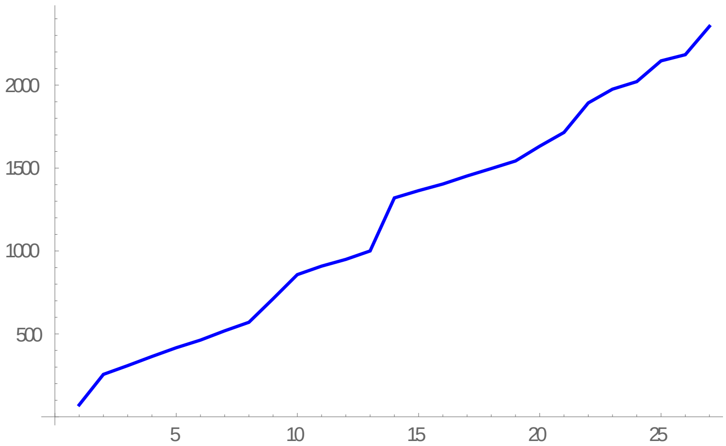
Show[h,j,k]



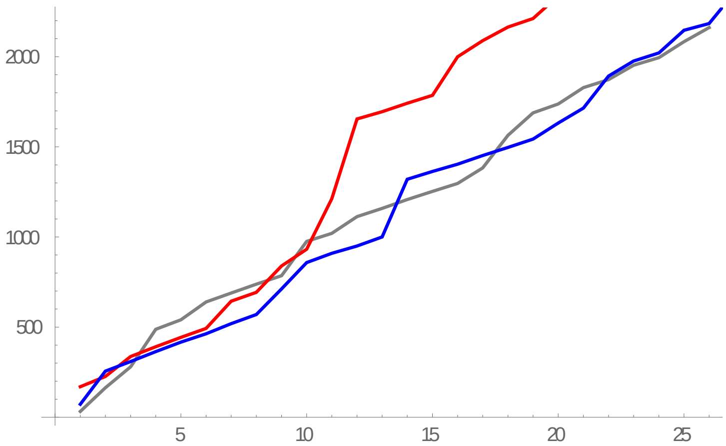
h)


2500
2000
1500
1000
500
5
10
15
20

j)


2000
1500
1000
500
5
10
15
20
25

k)


2000
1500
1000
500
5
10
15
20
25

h) j) k)