```
>   #This is Maple code
>   # by Matt  Anderson
>   # This is procecure for pairs of prime numbers, and the data sets it can make.
>   mtx1 := Matrix(3, 100) :
>   # put counting numbers and prime pairs in mtx1.
>   #input difference between the two prime numbers with variable diff1.  (Input to proc())
>
>   # note the two prime numbers are not neccessarily consecutive primes.
>   # could use ithprime() to optimise, but the calculation is already pretty quick.
>
>   # This is clean code, if I do say so myself.
>
>
>
>   mattsPrimePairsProc :=proc(diff1);
       local a, counter, searchstop;

       counter := 1 :
       searchstop := 1000;                              # local parameter
       for a from 3 to searchstop by 2 do
       if isprime(a) and isprime(a+diff1) then print(counter, "hourah!! we found a pair", a, " ", a
           +diff1);
        counter := counter+1;
        end if;
        end do;
        end proc;
```

$mattsPrimePairsProc := \mathbf{proc}(diff1)$ **(1)**
$\quad \mathbf{local}\ a, counter, searchstop;$

$\quad counter := 1;$

$\quad searchstop := 1000;$

$\quad \mathbf{for}\ a\ \mathbf{from}\ 3\ \mathbf{by}\ 2\ \mathbf{to}\ searchstop\ \mathbf{do}$

$\qquad \mathbf{if}\ isprime(a)\ \mathbf{and}\ isprime(a+diff1)\ \mathbf{then}$

$\qquad\quad print(counter, \text{"hourah!! we found a pair"}, a, " ", a+diff1);\ counter := counter+1$

$\qquad \mathbf{end\ if}$

$\quad \mathbf{end\ do}$

$\mathbf{end\ proc}$

```
>
>
>   diff1 := 100;
```
$$diff1 := 100 \qquad\qquad\qquad\qquad (2)$$

```
>   counter := 1 :
>   for a from 3 to 1000 by 2 do
     if isprime(a) and isprime(a+diff1) then print(counter, "yay! found a pair", a, " ", a+diff1);
         counter := counter+1; end if;
      end do;
```
$$1, \text{"yay! found a pair"}, 3, " ", 103$$

2, "yay! found a pair", 7, " ", 107
3, "yay! found a pair", 13, " ", 113
4, "yay! found a pair", 31, " ", 131
5, "yay! found a pair", 37, " ", 137
6, "yay! found a pair", 67, " ", 167
7, "yay! found a pair", 73, " ", 173
8, "yay! found a pair", 79, " ", 179
9, "yay! found a pair", 97, " ", 197
10, "yay! found a pair", 127, " ", 227
11, "yay! found a pair", 139, " ", 239
12, "yay! found a pair", 151, " ", 251
13, "yay! found a pair", 157, " ", 257
14, "yay! found a pair", 163, " ", 263
15, "yay! found a pair", 181, " ", 281
16, "yay! found a pair", 193, " ", 293
17, "yay! found a pair", 211, " ", 311
18, "yay! found a pair", 283, " ", 383
19, "yay! found a pair", 331, " ", 431
20, "yay! found a pair", 349, " ", 449
21, "yay! found a pair", 367, " ", 467
22, "yay! found a pair", 379, " ", 479
23, "yay! found a pair", 409, " ", 509
24, "yay! found a pair", 421, " ", 521
25, "yay! found a pair", 457, " ", 557
26, "yay! found a pair", 463, " ", 563
27, "yay! found a pair", 487, " ", 587
28, "yay! found a pair", 499, " ", 599
29, "yay! found a pair", 541, " ", 641
30, "yay! found a pair", 547, " ", 647
31, "yay! found a pair", 577, " ", 677
32, "yay! found a pair", 601, " ", 701
33, "yay! found a pair", 619, " ", 719
34, "yay! found a pair", 643, " ", 743
35, "yay! found a pair", 661, " ", 761
36, "yay! found a pair", 673, " ", 773
37, "yay! found a pair", 709, " ", 809
38, "yay! found a pair", 727, " ", 827
39, "yay! found a pair", 739, " ", 839
40, "yay! found a pair", 757, " ", 857
41, "yay! found a pair", 787, " ", 887
42, "yay! found a pair", 811, " ", 911
43, "yay! found a pair", 829, " ", 929

$$44, \text{"yay! found a pair"}, 853, \text{" "}, 953$$
$$45, \text{"yay! found a pair"}, 877, \text{" "}, 977$$
$$46, \text{"yay! found a pair"}, 883, \text{" "}, 983$$
$$47, \text{"yay! found a pair"}, 919, \text{" "}, 1019$$
$$48, \text{"yay! found a pair"}, 991, \text{" "}, 1091$$
$$49, \text{"yay! found a pair"}, 997, \text{" "}, 1097 \qquad \textbf{(3)}$$

> *# and that, gentlemen, is how you do that*
> *# quote from   movie Apollo 13*
> *# Matt*
> *#share*
>
> *# and now shorten the function call to only 6 letters. call it mpairs*
>

```
mpairs := proc(diff1);
    local a, counter, searchstop;

    counter := 1 :
    searchstop := 1000;                        # local parameter
    for a from 3 to searchstop by 2 do
    if isprime(a) and isprime(a+diff1) then print(counter, "hourah!! we found a pair", a, " ", a
        +diff1);
    counter := counter+1;
    end if;
    end do;
    end proc;
```

$$mpairs := \textbf{proc}(diff1) \qquad \textbf{(4)}$$
local *a*, *counter*, *searchstop*;

counter := 1;

searchstop := 1000;

for *a* **from** 3 **by** 2 **to** *searchstop* **do**

    if *isprime*(*a*) **and** *isprime*(*a*+*diff1*) **then**

        print(*counter*, "hourah!! we found a pair", *a*, " ", *a*+*diff1*); *counter* := *counter*+1

    end if

    end do

end proc

> *# try it out with 3000.*
> *mpairs*(3000);

$$1, \text{"hourah!! we found a pair"}, 11, \text{" "}, 3011$$
$$2, \text{"hourah!! we found a pair"}, 19, \text{" "}, 3019$$
$$3, \text{"hourah!! we found a pair"}, 23, \text{" "}, 3023$$
$$4, \text{"hourah!! we found a pair"}, 37, \text{" "}, 3037$$
$$5, \text{"hourah!! we found a pair"}, 41, \text{" "}, 3041$$
$$6, \text{"hourah!! we found a pair"}, 61, \text{" "}, 3061$$
$$7, \text{"hourah!! we found a pair"}, 67, \text{" "}, 3067$$
$$8, \text{"hourah!! we found a pair"}, 79, \text{" "}, 3079$$

9, "hourah!! we found a pair", 83, " ", 3083
10, "hourah!! we found a pair", 89, " ", 3089
11, "hourah!! we found a pair", 109, " ", 3109
12, "hourah!! we found a pair", 137, " ", 3137
13, "hourah!! we found a pair", 163, " ", 3163
14, "hourah!! we found a pair", 167, " ", 3167
15, "hourah!! we found a pair", 181, " ", 3181
16, "hourah!! we found a pair", 191, " ", 3191
17, "hourah!! we found a pair", 229, " ", 3229
18, "hourah!! we found a pair", 251, " ", 3251
19, "hourah!! we found a pair", 257, " ", 3257
20, "hourah!! we found a pair", 271, " ", 3271
21, "hourah!! we found a pair", 307, " ", 3307
22, "hourah!! we found a pair", 313, " ", 3313
23, "hourah!! we found a pair", 331, " ", 3331
24, "hourah!! we found a pair", 347, " ", 3347
25, "hourah!! we found a pair", 359, " ", 3359
26, "hourah!! we found a pair", 373, " ", 3373
27, "hourah!! we found a pair", 389, " ", 3389
28, "hourah!! we found a pair", 433, " ", 3433
29, "hourah!! we found a pair", 449, " ", 3449
30, "hourah!! we found a pair", 457, " ", 3457
31, "hourah!! we found a pair", 461, " ", 3461
32, "hourah!! we found a pair", 463, " ", 3463
33, "hourah!! we found a pair", 467, " ", 3467
34, "hourah!! we found a pair", 491, " ", 3491
35, "hourah!! we found a pair", 499, " ", 3499
36, "hourah!! we found a pair", 541, " ", 3541
37, "hourah!! we found a pair", 547, " ", 3547
38, "hourah!! we found a pair", 557, " ", 3557
39, "hourah!! we found a pair", 571, " ", 3571
40, "hourah!! we found a pair", 593, " ", 3593
41, "hourah!! we found a pair", 607, " ", 3607
42, "hourah!! we found a pair", 613, " ", 3613
43, "hourah!! we found a pair", 617, " ", 3617
44, "hourah!! we found a pair", 631, " ", 3631
45, "hourah!! we found a pair", 643, " ", 3643
46, "hourah!! we found a pair", 659, " ", 3659
47, "hourah!! we found a pair", 673, " ", 3673
48, "hourah!! we found a pair", 677, " ", 3677
49, "hourah!! we found a pair", 691, " ", 3691
50, "hourah!! we found a pair", 701, " ", 3701

51, "hourah!! we found a pair", 709, " ", 3709
52, "hourah!! we found a pair", 719, " ", 3719
53, "hourah!! we found a pair", 727, " ", 3727
54, "hourah!! we found a pair", 733, " ", 3733
55, "hourah!! we found a pair", 739, " ", 3739
56, "hourah!! we found a pair", 761, " ", 3761
57, "hourah!! we found a pair", 769, " ", 3769
58, "hourah!! we found a pair", 797, " ", 3797
59, "hourah!! we found a pair", 821, " ", 3821
60, "hourah!! we found a pair", 823, " ", 3823
61, "hourah!! we found a pair", 853, " ", 3853
62, "hourah!! we found a pair", 863, " ", 3863
63, "hourah!! we found a pair", 877, " ", 3877
64, "hourah!! we found a pair", 881, " ", 3881
65, "hourah!! we found a pair", 907, " ", 3907
66, "hourah!! we found a pair", 911, " ", 3911
67, "hourah!! we found a pair", 919, " ", 3919
68, "hourah!! we found a pair", 929, " ", 3929
69, "hourah!! we found a pair", 947, " ", 3947
70, "hourah!! we found a pair", 967, " ", 3967

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> *# success*
> *# 44 is someone else's favorite number. Let's try that. (YouTube How Rediculous Brett Stanford)*
> *mpairs(44)*

1, "hourah!! we found a pair", 3, " ", 47
2, "hourah!! we found a pair", 17, " ", 61
3, "hourah!! we found a pair", 23, " ", 67
4, "hourah!! we found a pair", 29, " ", 73
5, "hourah!! we found a pair", 53, " ", 97
6, "hourah!! we found a pair", 59, " ", 103
7, "hourah!! we found a pair", 83, " ", 127
8, "hourah!! we found a pair", 107, " ", 151
9, "hourah!! we found a pair", 113, " ", 157
10, "hourah!! we found a pair", 137, " ", 181
11, "hourah!! we found a pair", 149, " ", 193
12, "hourah!! we found a pair", 167, " ", 211
13, "hourah!! we found a pair", 179, " ", 223
14, "hourah!! we found a pair", 197, " ", 241
15, "hourah!! we found a pair", 227, " ", 271
16, "hourah!! we found a pair", 233, " ", 277
17, "hourah!! we found a pair", 239, " ", 283
18, "hourah!! we found a pair", 263, " ", 307
19, "hourah!! we found a pair", 269, " ", 313

$$20, \text{"hourah!! we found a pair"}, 293, " ", 337$$
$$21, \text{"hourah!! we found a pair"}, 353, " ", 397$$
$$22, \text{"hourah!! we found a pair"}, 389, " ", 433$$
$$23, \text{"hourah!! we found a pair"}, 419, " ", 463$$
$$24, \text{"hourah!! we found a pair"}, 443, " ", 487$$
$$25, \text{"hourah!! we found a pair"}, 479, " ", 523$$
$$26, \text{"hourah!! we found a pair"}, 503, " ", 547$$
$$27, \text{"hourah!! we found a pair"}, 557, " ", 601$$
$$28, \text{"hourah!! we found a pair"}, 563, " ", 607$$
$$29, \text{"hourah!! we found a pair"}, 569, " ", 613$$
$$30, \text{"hourah!! we found a pair"}, 587, " ", 631$$
$$31, \text{"hourah!! we found a pair"}, 599, " ", 643$$
$$32, \text{"hourah!! we found a pair"}, 617, " ", 661$$
$$33, \text{"hourah!! we found a pair"}, 647, " ", 691$$
$$34, \text{"hourah!! we found a pair"}, 683, " ", 727$$
$$35, \text{"hourah!! we found a pair"}, 743, " ", 787$$
$$36, \text{"hourah!! we found a pair"}, 809, " ", 853$$
$$37, \text{"hourah!! we found a pair"}, 839, " ", 883$$
$$38, \text{"hourah!! we found a pair"}, 863, " ", 907$$
$$39, \text{"hourah!! we found a pair"}, 947, " ", 991$$
$$40, \text{"hourah!! we found a pair"}, 953, " ", 997$$
$$41, \text{"hourah!! we found a pair"}, 977, " ", 1021$$

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> # *I like the number 14 because there are 14 days in 2 weeks.*
> *mpairs*(14)

$$1, \text{"hourah!! we found a pair"}, 3, " ", 17$$
$$2, \text{"hourah!! we found a pair"}, 5, " ", 19$$
$$3, \text{"hourah!! we found a pair"}, 17, " ", 31$$
$$4, \text{"hourah!! we found a pair"}, 23, " ", 37$$
$$5, \text{"hourah!! we found a pair"}, 29, " ", 43$$
$$6, \text{"hourah!! we found a pair"}, 47, " ", 61$$
$$7, \text{"hourah!! we found a pair"}, 53, " ", 67$$
$$8, \text{"hourah!! we found a pair"}, 59, " ", 73$$
$$9, \text{"hourah!! we found a pair"}, 83, " ", 97$$
$$10, \text{"hourah!! we found a pair"}, 89, " ", 103$$
$$11, \text{"hourah!! we found a pair"}, 113, " ", 127$$
$$12, \text{"hourah!! we found a pair"}, 137, " ", 151$$
$$13, \text{"hourah!! we found a pair"}, 149, " ", 163$$
$$14, \text{"hourah!! we found a pair"}, 167, " ", 181$$
$$15, \text{"hourah!! we found a pair"}, 179, " ", 193$$
$$16, \text{"hourah!! we found a pair"}, 197, " ", 211$$
$$17, \text{"hourah!! we found a pair"}, 227, " ", 241$$
$$18, \text{"hourah!! we found a pair"}, 257, " ", 271$$
$$19, \text{"hourah!! we found a pair"}, 263, " ", 277$$

20, "hourah!! we found a pair", 269, " ", 283
21, "hourah!! we found a pair", 293, " ", 307
22, "hourah!! we found a pair", 317, " ", 331
23, "hourah!! we found a pair", 353, " ", 367
24, "hourah!! we found a pair", 359, " ", 373
25, "hourah!! we found a pair", 383, " ", 397
26, "hourah!! we found a pair", 419, " ", 433
27, "hourah!! we found a pair", 443, " ", 457
28, "hourah!! we found a pair", 449, " ", 463
29, "hourah!! we found a pair", 509, " ", 523
30, "hourah!! we found a pair", 557, " ", 571
31, "hourah!! we found a pair", 563, " ", 577
32, "hourah!! we found a pair", 587, " ", 601
33, "hourah!! we found a pair", 593, " ", 607
34, "hourah!! we found a pair", 599, " ", 613
35, "hourah!! we found a pair", 617, " ", 631
36, "hourah!! we found a pair", 647, " ", 661
37, "hourah!! we found a pair", 659, " ", 673
38, "hourah!! we found a pair", 677, " ", 691
39, "hourah!! we found a pair", 719, " ", 733
40, "hourah!! we found a pair", 743, " ", 757
41, "hourah!! we found a pair", 773, " ", 787
42, "hourah!! we found a pair", 797, " ", 811
43, "hourah!! we found a pair", 809, " ", 823
44, "hourah!! we found a pair", 839, " ", 853
45, "hourah!! we found a pair", 863, " ", 877
46, "hourah!! we found a pair", 953, " ", 967
47, "hourah!! we found a pair", 977, " ", 991
48, "hourah!! we found a pair", 983, " ", 997

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>
> # now you know that (assuming the k-tuple conjecture) there can be a long list of pairs of
> #prime numbers that are separated by 14.
> # Your life is complete now.
>