July 2018 - Challenge

This month's challenge is based on a riddle I heard from Odelia Moshe Ostrovsky (thanks!).

Let's call a triplet of natural numbers "obscure" if one cannot uniquely deduce them from their sum and product. For example, {2,8,9} is an obscure triplet, because {3,4,12} shares the same sum (19) and the same product (144).

Find a triplet of ages {a,b,c} that is obscure and stays obscure for three more years: {a+1,b+1,c+1}, {a+2,b+2,c+2} and {a+3,b+3,c+3}.

Solution:

Hi Oded,

The triplet (9, 21, 62) remains obscure for 5 consecutive years. Might have to tweak my search to find one that works for 6 years.

(9, 21, 62) Sum = 92 Product = 11718

(7, 31, 54) Sum = 92 Product = 11718

(10, 22, 63) Sum = 95 Product = 13860

(14, 15, 66) Sum = 95 Product = 13860

(11, 23, 64) Sum = 98 Product = 16192

(8, 44, 46) Sum = 98 Product = 16192

(12, 24, 65) Sum = 101 Product = 18720

(9, 52, 40) Sum = 101 Product = 18720

(13, 25, 66) Sum = 104 Product = 21450

(10, 39, 55) Sum = 104 Product = 21450

Thanks for considering.

Charles Joscelyne

Minizinc Model

```
var 0..120: a;
var 0..120: b;
var 0..120: c;

var 0..120: x1;
var 0..120: x2;
var 0..120: x3;

var 0..120: y1;
var 0..120: y2;
var 0..120: y3;

var 0..120: z1;
var 0..120: z2;
var 0..120: z3;

var 0..120: w1;
var 0..120: w2;
var 0..120: w3;

var 0..120: s1;
var 0..120: s2;
var 0..120: s3;


var 0..120: t1;
var 0..120: t2;
var 0..120: t3;



constraint a+b+c == x1+x2+x3;
constraint a*b*c == x1*x2*x3;
constraint (a!=x1\/b!=x2\/c!=x3);
constraint a<=b/\b<=c;
constraint x1<=x2/\x2<=x3;

constraint a+b+c+3 == y1+y2+y3;
constraint (a+1)*(b+1)*(c+1) == (y1)*(y2)*(y3);
constraint a+1!=y1\/b+1!=y2\/c+1!=y3;
constraint y1<=y2/\y2<=y3;


constraint a+b+c+6== z1+z2+z3;
constraint (a+2)*(b+2)*(c+2) ==(z1)*(z2)*(z3);
constraint a+2!=z1\/b+2!=z2\/c+2!=z3;
constraint z1<=z2/\z2<=z3;

constraint a+b+c+9== w1+w2+w3;
constraint (a+3)*(b+3)*(c+3)== (w1)*(w2)*(w3);
constraint a+3!=w1\/b+3!=w2\/c+3!=w3;
constraint w1<=w2/\w2<=w3;
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