Behind Story of This Year

Let's add all the 1-digit numbers and get it squared.

```
n =
```

```
n = 1×10
     0     1     2     3     4     5     6     7     8     9
```

Sum all the values in n and store the result to s.

```
s =
```

```
s =
45
```

Get it squared and store the result to y.

```
y =
```

```
y =
2025
```

```
disp("The squre of the sum of 0 to 9 is " + sum(0:9)^2)
```

```
The squre of the sum of 0 to 9 is 2025
```

In summary,

$$\left(\sum_{n=0}^{9} n\right)^2 = 2025$$

How about add all the cubes of 1-digit numbers.

```
p =
```

```
p = 1×10
     0     1     8    27    64   125   216   343   512   729
```

```
q = sum(p)
```

```
q =
2025
```

```
disp("The sum of the cubed values of numbers from 0 to 9 is " +
sum( (0:9).^3))
```

```
The sum of the cubed values of numbers from 0 to 9 is 2025
```

In summary,

$$\sum_{n=0}^{9} n^3 = 2025$$

Is this just a coincidence?

Let's add all the numbers from 0 to n and get it squared.

```
syms n k
S1 = symsum(k, k, 0, n)^2
```

S1 =

$$\frac{n^2\ (n+1)^2}{4}$$

Ok, then, how about the sum of cubes from 0 to n.

```
S2 = symsum(k^3, k, 0, n)
```

S2 =

$$\frac{n^2\ (n+1)^2}{4}$$

In summary,

$$\left(\sum_{k=0}^{n} k\right)^2 \equiv \sum_{k=0}^{n} k^3$$

Which years follow the same pattern?

```
yOthers = subs(S1, n, 7:11)
```

yOthers = $(784 \quad 1296 \quad 2025 \quad 3025 \quad 4356)$