We introduce the structure constants of sl2
We show the Killing-Cartan metric

```
 -8.00 0.00 0.00
 0.00 8.00 0.00
 0.00 0.00 8.00
```

and its determinant
-512.0

In what follows we expand sl2 with all the abelian semigroups of order 4 having
zero element and identify the ones that leads to a semisimple algebra.
****
A semisimple algebra has been found, expanding with the semigroup #59
1 1 1 1
1 2 1 1
1 1 3 1
1 1 1 4
whose zero element is: 1.
The metric of the reduced algebra is:

```
 -8.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 -8.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 -8.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 8.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 8.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 0.00 8.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 8.00
```

and its determinant
-1.34217728E8
****
A semisimple algebra has been found, expanding with the semigroup #62
1 1 1 1
1 2 1 1
1 1 3 3
1 1 3 4
whose zero element is: 1.
The metric of the reduced algebra is:

```
 -8.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 -8.00 -8.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 -8.00 -16.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 8.00 8.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 8.00 16.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 0.00 8.00 8.00
 0.00 0.00 0.00 0.00 0.00 0.00 0.00 8.00 16.00
```

and its determinant
-1.34217728E8
****

A semisimple algebra has been found, expanding with the semigroup #64
1 1 1 1
1 2 1 1
1 1 3 4
1 1 4 3
whose zero element is: 1.
The metric of the reduced algebra is:

```
 -8.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 -16.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 -16.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 16.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 16.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 0.00 16.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 16.00
```

and its determinant
-8.589934592E9
****
A semisimple algebra has been found, expanding with the semigroup #68
1 1 1 1
1 2 1 2
1 1 3 3
1 2 3 4
whose zero element is: 1.
The metric of the reduced algebra is:

```
 -8.00 0.00 -8.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 -8.00 -8.00 0.00 0.00 0.00 0.00 0.00 0.00
 -8.00 -8.00 -24.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 0.00 8.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 8.00 8.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 8.00 24.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 0.00 8.00
 0.00 0.00 0.00 0.00 0.00 0.00 0.00 8.00 8.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 8.00 24.00
```

and its determinant
-1.34217728E8
****
A semisimple algebra has been found, expanding with the semigroup #83
1 1 1 1
1 2 2 2
1 2 3 2
1 2 2 4
whose zero element is: 1.
The metric of the reduced algebra is:

```
 -8.00 -8.00 -8.00 0.00 0.00 0.00 0.00 0.00 0.00
 -8.00 -16.00 -8.00 0.00 0.00 0.00 0.00 0.00 0.00
 -8.00 -8.00 -16.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 8.00 8.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 16.00 8.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 8.00 16.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 8.00 8.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 16.00 8.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 8.00 16.00
```

and its determinant
-1.34217728E8
****
A semisimple algebra has been found, expanding with the semigroup #86
1 1 1 1
1 2 2 2
1 2 3 3
1 2 3 4
whose zero element is: 1.
The metric of the reduced algebra is:

```
 -8.00 -8.00 -8.00 0.00 0.00 0.00 0.00 0.00 0.00
 -8.00 -16.00 -16.00 0.00 0.00 0.00 0.00 0.00 0.00
 -8.00 -16.00 -24.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 8.00 8.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 16.00 16.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 16.00 24.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 8.00 8.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 16.00 16.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 16.00 24.00
```

and its determinant
-1.34217728E8
****
A semisimple algebra has been found, expanding with the semigroup #88
1 1 1 1
1 2 2 2
1 2 3 4
1 2 4 3
whose zero element is: 1.
The metric of the reduced algebra is:

```
 -8.00 -8.00 -8.00 0.00 0.00 0.00 0.00 0.00 0.00
 -8.00 -24.00 -8.00 0.00 0.00 0.00 0.00 0.00 0.00
 -8.00 -8.00 -24.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 8.00 8.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 24.00 8.00 0.00 0.00 0.00
 0.00 0.00 0.00 8.00 8.00 24.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 8.00 8.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 24.00 8.00
 0.00 0.00 0.00 0.00 0.00 0.00 8.00 8.00 24.00
```

and its determinant
-8.589934592E9
****

A semisimple algebra has been found, expanding with the semigroup #93
1 1 1 1
1 2 2 4
1 2 3 4
1 4 4 2
whose zero element is: 1.
The metric of the reduced algebra is:

```
 -16.00 -16.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
 -16.00 -24.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 -16.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 16.00 16.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 16.00 24.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 16.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 16.00 16.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 16.00 24.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 16.00
```

and its determinant
-8.589934592E9
****
A semisimple algebra has been found, expanding with the semigroup #99
1 1 1 1
1 2 3 4
1 3 4 2
1 4 2 3
whose zero element is: 1.
The metric of the reduced algebra is:

```
 -24.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 -24.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 -24.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 24.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 24.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 24.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 24.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 24.00
 0.00 0.00 0.00 0.00 0.00 0.00 0.00 24.00 0.00
```

and its determinant
2.641807540224E12
****

There are 39 semigroups of order 4 with zero element.
And 9 of them leads to a semisimple algebra.