In[1]:=
```
SetDirectory["~/writing/WIP/KappaLib/"];
<< kappaLib.m
```

```
KappaLib v1.1
```

- **In this notebook we show that the a_i and b_i constants in Metaclass I can be ordered into any order by a change of coordinates**
- **Permutate b1 <---> b2, a1 <---> a2.**

In[3]:=
```
kappa = emMatrixToKappa[{{a1, 0, 0, -b1, 0, 0}, {0, a2, 0, 0, -b2, 0}, {0, 0, a3, 0, 0, -b3}, {b1, 0, 0, a1, 0, 0}, {0, b2, 0, 0, a2, 0}, {0, 0, b3, 0, 0, a3}}];
```

In[4]:=
```
(* Define coordinate change. *)
jacobian = {{1, 0, 0, 0}, {0, 0, -1, 0}, {0, 1, 0, 0}, {0, 0, 0, 1}};
(* Note: change is orientation preserving. *)
Det[jacobian]
```

Out[5]= 1

In[6]:=
```
kappaT = emCoordinateChange[kappa, jacobian];
emKappaToMatrix[kappaT] // MatrixForm
```

Out[7]//MatrixForm=

$$\begin{pmatrix} a2 & 0 & 0 & -b2 & 0 & 0 \\ 0 & a1 & 0 & 0 & -b1 & 0 \\ 0 & 0 & a3 & 0 & 0 & -b3 \\ b2 & 0 & 0 & a2 & 0 & 0 \\ 0 & b1 & 0 & 0 & a1 & 0 \\ 0 & 0 & b3 & 0 & 0 & a3 \end{pmatrix}$$

- **Permutate b2 <---> b3, a2 <---> a3.**

In[8]:=
```
(* Define coordinate change. *)
jacobian = {{1, 0, 0, 0}, {0, 1, 0, 0}, {0, 0, 0, -1}, {0, 0, 1, 0}};
(* Note: change is orientation preserving. *)
Det[jacobian]
```

Out[9]= 1

In[10]:=
```
kappaT = emCoordinateChange[kappa, jacobian];
emKappaToMatrix[kappaT] // MatrixForm
```

Out[11]//MatrixForm=

$$\begin{pmatrix} a1 & 0 & 0 & -b1 & 0 & 0 \\ 0 & a3 & 0 & 0 & -b3 & 0 \\ 0 & 0 & a2 & 0 & 0 & -b2 \\ b1 & 0 & 0 & a1 & 0 & 0 \\ 0 & b3 & 0 & 0 & a3 & 0 \\ 0 & 0 & b2 & 0 & 0 & a2 \end{pmatrix}$$