

```
In[1]:= SetDirectory["~/KappaLib/"];
<< kappaLib-1.2.m
Loading KappaLib v1.2
```

■ Section 4.3: Compute matrix

epsilon = (epsilon^IJ)_IJ

```
In[3]:= Table[emOrd[i], {i, 1, 6}] // MatrixForm
```

Out[3]/MatrixForm=

$$\begin{pmatrix} 1 & 2 \\ 1 & 3 \\ 1 & 4 \\ 3 & 4 \\ 4 & 2 \\ 2 & 3 \end{pmatrix}$$

```
In[4]:= mat = Table[
  Signature[
    {(emOrd[i])[1], (emOrd[i])[2], (emOrd[j])[1], (emOrd[j])[2]}],
    {i, 1, 6},
    {j, 1, 6}
  ];
mat // MatrixForm
```

Out[5]/MatrixForm=

$$\begin{pmatrix} 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \end{pmatrix}$$

■ Extra: epsilon coincides with 6x6 matrix representation of the Euclidean Hodge star operator

```
In[6]:= g = DiagonalMatrix[{1, 1, 1, 1}];
kappa = emHodge[g];
emKappaToMatrix[kappa] // MatrixForm
```

Out[8]/MatrixForm=

$$\begin{pmatrix} 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \end{pmatrix}$$