```
n = 2;
```

```
b[2, 1] := b[1, 2]
```

```
B = ParamMatrix[b, n] * Table[x^(2 - i - j) y^(j + i), {j, 0, n - 1}, {i, 0, n - 1}]
```

$$\left\{\left\{x^2\, b[1, 1],\ x\, y\, b[1, 2]\right\},\ \left\{x\, y\, b[1, 2],\ y^2\, b[2, 2]\right\}\right\}$$

```
t = {c[1, 1], c[1, 2]}.B.{c[2, 1], c[2, 2]}
```

$$\left(x^2\, b[1, 1]\, c[1, 1] + x\, y\, b[1, 2]\, c[1, 2]\right) c[2, 1] + \left(x\, y\, b[1, 2]\, c[1, 1] + y^2\, b[2, 2]\, c[1, 2]\right) c[2, 2]$$

```
D[t, y, y]
```

$$2\, b[2, 2]\, c[1, 2]\, c[2, 2]$$

```
Expand[{D[t, x] == 0, D[t, y] == 0, t == 0}]
```

$$\left\{2\, x\, b[1, 1]\, c[1, 1]\, c[2, 1] + y\, b[1, 2]\, c[1, 2]\, c[2, 1] + y\, b[1, 2]\, c[1, 1]\, c[2, 2] == 0,\ x\, b[1, 2]\, c[1, 2]\, c[2, 1] + x\, b[1, 2]\, c[1, 1]\, c[2, 2] + 2\, y\, b[2, 2]\, c[1, 2]\, c[2, 2] == 0,\ x^2\, b[1, 1]\, c[1, 1]\, c[2, 1] + x\, y\, b[1, 2]\, c[1, 2]\, c[2, 1] + x\, y\, b[1, 2]\, c[1, 1]\, c[2, 2] + y^2\, b[2, 2]\, c[1, 2]\, c[2, 2] == 0\right\}$$

```
m = {{2 x b[1, 1], y b[1, 2], y b[1, 2], 0}, {0, x b[1, 2], x b[1, 2], 2 y b[2, 2]},
   {x^2 b[1, 1], x y b[1, 2], x y b[1, 2], y^2 b[2, 2]}, {0, 0, 0, 0}};
```

```
KroneckerProduct[{c[1, 1], c[1, 2]}, {c[2, 1], c[2, 2]}]
```

$$\left\{\left\{c[1, 1]\, c[2, 1],\ c[1, 1]\, c[2, 2]\right\},\ \left\{c[1, 2]\, c[2, 1],\ c[1, 2]\, c[2, 2]\right\}\right\}$$

```
{#[[1]] // MatrixForm, MatrixForm /@ #[[2]]} &[Eigensystem[m]]
```

$$\left\{\begin{pmatrix} 0 \\ 0 \\ \frac{1}{2}\left(2\,x\,b[1,1]+x\,b[1,2]+x\,y\,b[1,2]-x\sqrt{4\,b[1,1]^2-4\,b[1,1]\,b[1,2]+b[1,2]^2+2\,y\,b} \\ \frac{1}{2}\left(2\,x\,b[1,1]+x\,b[1,2]+x\,y\,b[1,2]+x\sqrt{4\,b[1,1]^2-4\,b[1,1]\,b[1,2]+b[1,2]^2+2\,y\,b}\end{pmatrix}\right.$$

$$\begin{pmatrix} -\dfrac{2\left(2\,b[1,1]-b[1,2]-\sqrt{4\,b[1,1]^2-4\,b[1,1]\,b[1,2]+b[1,2]^2+2\,y\,b[1,2]^2+y^2\,b[1,2]^2}\right)}{x\left(-2\,b[1,1]+b[1,2]-y\,b[1,2]+\sqrt{4\,b[1,1]^2-4\,b[1,1]\,b[1,2]+b[1,2]^2+2\,y\,b[1,2]^2+y^2\,b[1,2]^2}\right)} \\ \dfrac{2\,b[1,2]}{2\,b[1,1]-b[1,2]+y\,b[1,2]-\sqrt{4\,b[1,1]^2-4\,b[1,1]\,b[1,2]+b[1,2]^2+2\,y\,b[1,2]^2+y^2\,b[1,2]^2}} \\ 1 \\ 0 \end{pmatrix},$$

$$\left.\begin{pmatrix} \dfrac{2\left(2\,b[1,1]-b[1,2]+\sqrt{4\,b[1,1]^2-4\,b[1,1]\,b[1,2]+b[1,2]^2+2\,y\,b[1,2]^2+y^2\,b[1,2]^2}\right)}{x\left(2\,b[1,1]-b[1,2]+y\,b[1,2]+\sqrt{4\,b[1,1]^2-4\,b[1,1]\,b[1,2]+b[1,2]^2+2\,y\,b[1,2]^2+y^2\,b[1,2]^2}\right)} \\ \dfrac{2\,b[1,2]}{2\,b[1,1]-b[1,2]+y\,b[1,2]+\sqrt{4\,b[1,1]^2-4\,b[1,1]\,b[1,2]+b[1,2]^2+2\,y\,b[1,2]^2+y^2\,b[1,2]^2}} \\ 1 \\ 0 \end{pmatrix}\right\}\right\}$$

```
var = Flatten[{{c[1, 1] c[2, 1], c[1, 1] c[2, 2]}, {c[1, 2] c[2, 1], c[1, 2] c[2, 2]}}];
Solve[(# == 0) & /@ (var - {0, -1, 1, 0}), Flatten[Table[c[i, j], {i, 2}, {j, 2}]]]
```

```
{}
```

```
(# == 0) & /@ (var - {0, -1, 1, 0})
```

```
{c[1, 1] c[2, 1] == 0, 1 + c[1, 1] c[2, 2] == 0, -1 + c[1, 2] c[2, 1] == 0, c[1, 2] c[2, 2] == 0}
```