```
> # Jordan form example, ch5
> with(LinearAlgebra):
> # Problem 5.3-49
> A:=<139,-14,-52,-14,28|-22,5,7,8,-7|370,-38,-139,-38,76|152,-16,
  -59,-13,35|95,-10,-38,-7,23>^+;
```

$$A := \begin{bmatrix} 139 & -14 & -52 & -14 & 28 \\ -22 & 5 & 7 & 8 & -7 \\ 370 & -38 & -139 & -38 & 76 \\ 152 & -16 & -59 & -13 & 35 \\ 95 & -10 & -38 & -7 & 23 \end{bmatrix}$$

(1)

```
> J,Q:=JordanForm(A,output=['J','Q']);
  # JordanForm duplicates diagonal form AP=PD
```

$$J, Q := \begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0 & -3 & 0 & 0 & 0 \\ 0 & 0 & 3 & 0 & 0 \\ 0 & 0 & 0 & 6 & 0 \\ 0 & 0 & 0 & 0 & 9 \end{bmatrix}, \begin{bmatrix} 0 & -10 & -\dfrac{5}{3} & 0 & \dfrac{38}{3} \\ \dfrac{19}{2} & 0 & -\dfrac{35}{3} & \dfrac{13}{6} & 0 \\ 0 & -30 & -\dfrac{5}{3} & 0 & \dfrac{95}{3} \\ -\dfrac{19}{6} & -10 & -\dfrac{5}{3} & \dfrac{13}{6} & \dfrac{38}{3} \\ \dfrac{19}{6} & -10 & -\dfrac{5}{3} & \dfrac{13}{6} & \dfrac{19}{3} \end{bmatrix}$$

(2)

```
> # Another example: 3 Jordan blocks
> B:=Matrix([[3, 3, -2, -1], [1, 4, -1, -1], [1, 1, 2, -1], [1, 3,
  -2, 1]]);
```

$$B := \begin{bmatrix} 3 & 3 & -2 & -1 \\ 1 & 4 & -1 & -1 \\ 1 & 1 & 2 & -1 \\ 1 & 3 & -2 & 1 \end{bmatrix}$$

(3)

```
> J,Q:=JordanForm(B,output=['J','Q']);
```

$$J, Q := \begin{bmatrix} 2 & 0 & 0 & 0 \\ 0 & 3 & 1 & 0 \\ 0 & 0 & 3 & 0 \\ 0 & 0 & 0 & 2 \end{bmatrix}, \begin{bmatrix} 2 & -1 & 0 & 1 \\ -1 & -1 & 1 & 0 \\ -1 & -1 & 2 & 0 \\ 1 & -1 & 0 & 1 \end{bmatrix}$$

(4)

```
> # 3 Jordan blocks - do you see them?
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