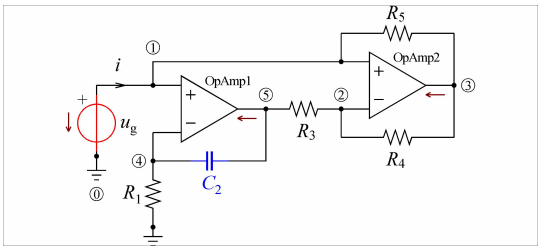
```
(%i1)  load("C:\\SALECx\\SALECx.mac") $
```

Dejan Tosic, SALECx 2019 v1.0
Symbolic Analysis of Linear Electric Circuits with Maxima

```
(%i2)  SALECxPrint: true $
```

```
(%i3)  Riordan_shema: [
         ["V", "Ug", 1, 0, Ug],
         ["OpAmp", "OpAmp1", [1,4], 5],
         ["R", "R1", 4, 0, R1],
         ["C", "C2", 4, 5, C2],
         ["R", "R3", 5, 2, R3],
         ["OpAmp", "OpAmp2", [1,2], 3],
         ["R", "R4", 2, 3, R4],
         ["R", "R5", 1, 3, R5]
        ]$
```




```
(%i4)  Riordan_response: SALECx(Riordan_shema);
```

Symbolic Analysis of Linear Electric Circuits with Maxima
SALECx version 1.0, Prof. Dr. Dejan Tošić, tosic@etf.rs
Number of nodes excluding 0 node: 5
Electric circuit specification: [[V,Ug,1,0,Ug],[OpAmp,OpAmp1,[1,4],5],[R,R1,4,0,R1],[C,C2,4,5,C2],[R,R3,5,2,R3],[OpAmp,OpAmp2,[1,2],3],[R,R4,2,3,R4],[R,R5,1,3,R5]]
Supported element: [true,true,true,true,true,true,true,true]
Element values: [Ug,false,R1,C2,R3,false,R4,R5]
Initial conditions: [false,false,false,false,false,false,false,false]

MNA equations: $$\left[\frac{V_1-V_3}{R5}+I_{Ug}=0,\ \frac{V_2-V_3}{R4}+\frac{V_2-V_5}{R3}=0,\ \frac{V_3-V_1}{R5}+\frac{V_3-V_2}{R4}+I_{OpAmp2}=0,\left(V_4-V_5\right)C2\,s+\frac{V_4}{R1}=0,\left(V_5-V_4\right)C2\,s+\frac{V_5-V_2}{R3}+I_{OpAmp1}=0,\ V_1-V_2=0,\ V_1-V_4=0,\ V_1=Ug\right]$$

MNA variables: $$\left[V_1,V_2,V_3,V_4,V_5,I_{OpAmp2},I_{OpAmp1},I_{Ug}\right]$$

(Riordan_response) $$\left[V_1=Ug,\ V_2=Ug,\ V_3=-\frac{R4\,Ug-C2\,R1\,R3\,Ug\,s}{C2\,R1\,R3\,s},\ V_4=Ug,\ V_5=\frac{C2\,R1\,Ug\,s+Ug}{C2\,R1\,s},\ I_{OpAmp2}=\frac{R5\,Ug+R4\,Ug}{C2\,R1\,R3\,R5\,s},\ I_{OpAmp1}=-\frac{C2\,R3\,Ug\,s+Ug}{C2\,R1\,R3\,s},\ I_{Ug}=-\frac{R4\,Ug}{C2\,R1\,R3\,R5\,s}\right]$$

```
(%i5)  Zin: Ug/(-I["Ug"]), Riordan_response;
```

(Zin) $$\frac{C2\,R1\,R3\,R5\,s}{R4}$$

```
(%i6)  Lsynthetic: Zin/s;
```

(Lsynthetic) $$\frac{C2\,R1\,R3\,R5}{R4}$$