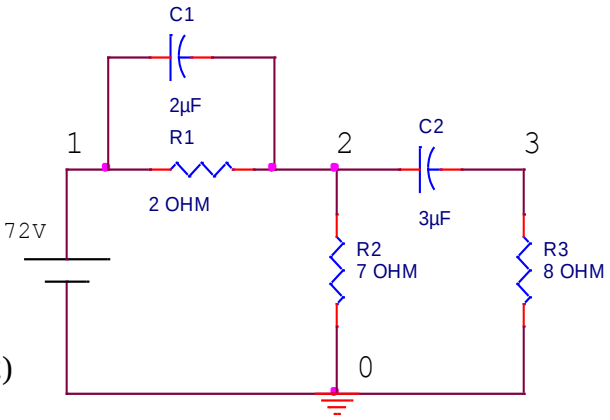
LAB #09

Objective: **Implementation of Simple RC Circuits and finding its response.**

Exercise#01: **Apply the above code in PSpice and show the output and verify the result with manual calculation.**

Example #01:




```
Va 1 0 72V
R1 1 2 2ohm
C1 1 2 2uF
R2 2 0 7ohm
C2 2 3 3uF
R3 3 0 8ohm
.DC Va 0 72 72
.PRINT DC V(R1) V(R2) V(R3) V(C1) V(C2)
.PRINT DC I(R1) I(R2) I(R3) I(C1) I(C2)
.options nopage
.END
```

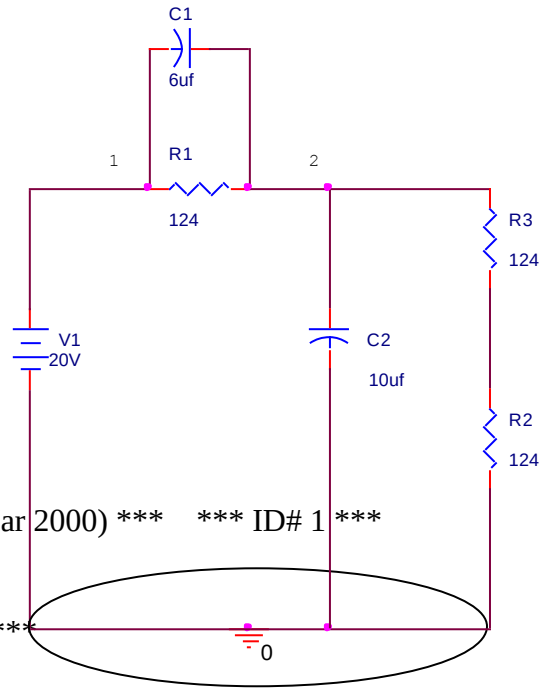
Output:

```
**** 04/17/21 08:49:33 ********* PSpice 9.2 (Mar 2000) ******** ID# 1 ********
Name: Ahmad Baseer       Roll no:124
****     CIRCUIT DESCRIPTION
******************************************************************************
Va 1 0 72V
R1 1 2 2 ohm
C1 1 2 2uF
R2 2 0 7 ohm
C2 2 3 3uF
R3 3 0 8 ohm
.DC Va 0 72 72
.PRINT DC V(R1) V(R2) V(R3) V(C1) V(C2)
.PRINT DC I(R1) I(R2) I(R3) I(C1) I(C2)
.options nopage
.END
****     DC TRANSFER CURVES            TEMPERATURE =   27.000 DEG C
Va            V(R1)        V(R2)        V(R3)        V(C1)        V(C2)

0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
7.200E+01  1.600E+01  5.600E+01  0.000E+00  1.600E+01  5.600E+01

****     DC TRANSFER CURVES            TEMPERATURE =   27.000 DEG C
Va            I(R1)        I(R2)        I(R3)        I(C1)        I(C2)

0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
7.200E+01  8.000E+00  8.000E+00  0.000E+00  0.000E+00  0.000E+00
```

Exercise#02: Write down the code in PSpice and find the voltage and current across each component (resistors and capacitor) .

Code:

```
V1 1 0 20V
R1 1 2 124 ohm
C1 1 2 6uF
R2 2 0 124 ohm
C2 2 0 10uF
R3 2 0 124 ohm
.DC V1 0 20 20
.PRINT DC V(R1) V(R2) V(R3) V(C1) V(C2)
.PRINT DC I(R1) I(R2) I(R3) I(C1) I(C2)
.options nopage
.END
```

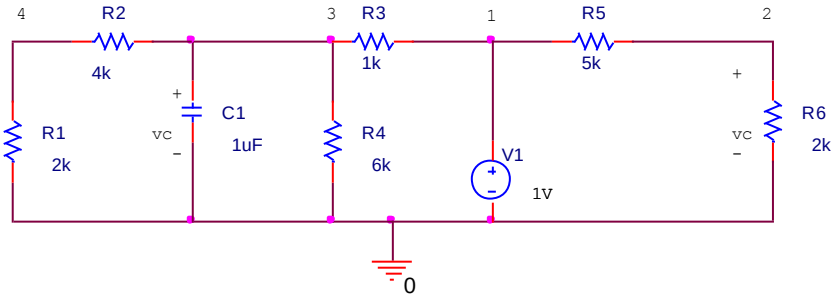


Output:

```
**** 04/17/21 09:10:00 ********* PSpice 9.2 (Mar 2000) ***    *** ID# 1 ***
Name: Ahmad Baseer       Roll no:124
****     CIRCUIT DESCRIPTION
******************************************************************************
V1 1 0 20
R1 1 2 124
C1 1 2 6uF
R2 2 0 124
C2 2 0 10uF
R3 2 0 124
.DC V1 0 20 20
.PRINT DC V(R1) V(R2) V(R3) V(C1) V(C2)
.PRINT DC I(R1) I(R2) I(R3) I(C1) I(C2)
.options nopage
.END
**** 04/17/21 09:10:00 ********* PSpice 9.2(Mar 2000) ******** ID# 1 ********
Name: Ahmad Baseer       Roll no:124****     DC TRANSFER CURVES
TEMPERATURE =   27.000 DEG C
******************************************************************************
V1           V(R1)        V(R2)        V(R3)        V(C1)        V(C2)

0.000E+00   0.000E+00   0.000E+00   0.000E+00   0.000E+00   0.000E+00
2.000E+01   1.333E+01   6.667E+00   6.667E+00   1.333E+01   6.667E+00

**** 04/17/21 09:10:00 ********* PSpice 9.2 (Mar 2000) ******** ID# 1 ********
Name: Ahmad Baseer       Roll no:124
****     DC TRANSFER CURVES            TEMPERATURE =   27.000 DEG C
******************************************************************************
V1            I(R1)        I(R2)         I(R3)        I(C1)         I(C2)

0.000E+00   0.000E+00   0.000E+00   0.000E+00   0.000E+00   0.000E+00
2.000E+01   1.075E-01   5.376E-02   5.376E-02   0.000E+00   0.000E+00
```

Exercise#03: Write down the code in PSpice and find the voltage and current across each component (resistors and capacitor).

Code:




```
V1 1 0 1
R1 4 0 2k
C1 3 0 1uF
R2 4 3 4k
R3 3 1 1k
R4 3 0 6k
R5 1 2 5k
R6 2 0 2k
.DC V1 0 1 1
.PRINT DC V(R1) V(R2) V(R3) V(C1) V(R4) V(R5) V(R6)
.PRINT DC I(R1) I(R2) I(R3) I(C1) I(R4) I(R5) I(R6)
.options nopage
.END
```

Output:

```
**** 04/17/21 09:51:38 ********* PSpice 9.2 (Mar 2000) ******** ID# 1 ********
Name: Ahmad Baseer       Roll no:124
****     CIRCUIT DESCRIPTION
******************************************************************************
V1 1 0 1V
R1 4 0 2k ohm
C1 3 0 1uF
R2 4 3 4k ohm
R3 3 1 1k ohm
R4 3 0 6k ohm
R5 1 2 5k ohm
R6 2 0 2k ohm
.DC V1 0 20 20
.PRINT DC V(R1) V(R2) V(R3) V(C1) V(R4) V(R5) V(R6)
.PRINT DC I(R1) I(R2) I(R3) I(C1) I(R4) I(R5) I(R6)
.options nopage
.END
****     DC TRANSFER CURVES            TEMPERATURE =   27.000 DEG C
V1            V(R1)         V(R2)         V(R3)         V(C1)         V(R4)
0.000E+00   0.000E+00   0.000E+00   0.000E+00   0.000E+00   0.000E+00
1.000E+00   2.500E-01  -5.000E-01   -2.500E-01   7.500E-01   7.500E-01
****     DC TRANSFER CURVES            TEMPERATURE =   27.000 DEG C
V1            V(R5)         V(R6)
0.000E+00   0.000E+00   0.000E+00
1.000E+00   7.143E-01   2.857E-01

****     DC TRANSFER CURVES            TEMPERATURE =   27.000 DEG C
V1            I(R1)         I(R2)         I(R3)         I(C1)         I(R4)
0.000E+00   0.000E+00   0.000E+00   0.000E+00   0.000E+00   0.000E+00
1.000E+00   1.250E-04  -1.250E-04   -2.500E-04   0.000E+00   1.250E-04
****     DC TRANSFER CURVES            TEMPERATURE =   27.000 DEG C
V1            I(R5)         I(R6)
0.000E+00   0.000E+00   0.000E+00
1.000E+00   1.429E-04   1.429E-04
```