

## lag\_1.gce

### Attributes

```
mainvars: x y  
rparms: tr=1
```

### Description

lag\_1.gce is used to create a variable that lags the given variable. The real parameter `tr` determines the amount by which `y` lags `x`. The equation used is,

$$\frac{dy}{dt} = \frac{1}{T_r} (-y + x) .$$

AC behaviour is not implemented.

Fig. 1 shows typical waveforms obtained with `lag_1.gce`. The corresponding circuit file is given below.

```

title: test_lag_1.in

begin_circuit
  gelement type=vsrcac vxn=va a=1 f_hz=50 phi=0
  gelement type=lag_1 x=va y=y tr=5m

  outvar:
+    va=var_of_va
+    y=var_of_y
end_circuit

begin_solve
  solve_type=startup
  initial_sol initialize
end_solve

begin_solve
  solve_type=trns
  initial_sol previous
  begin_output
    filename=test_lag_1.dat limit_lines=500000
    variables: va y
  end_output
  method: t_start=0 t_end=100m itmax_trns=500000
+  back_euler=yes norm_2=1e-6 deltat=0.1m
+  n_wrtiterno=1000
end_solve

end_cf

```

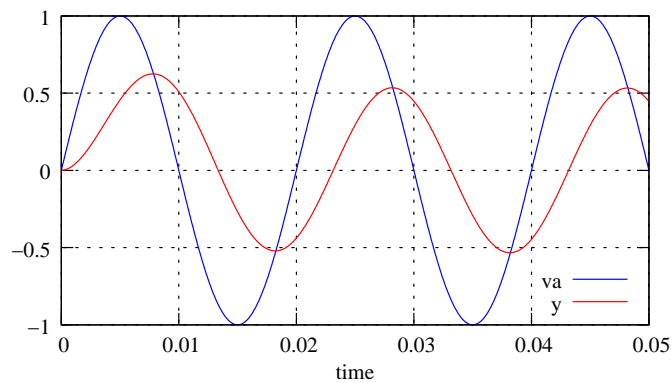


Figure 1: Waveforms obtained with `lag_1.gce` (see the circuit file for details).