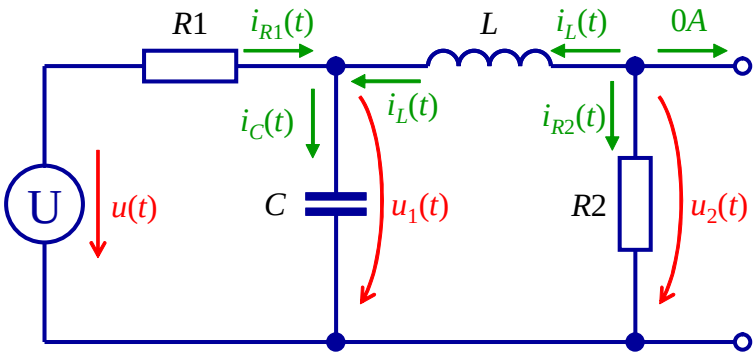
Metoda uzlových napětí - ukázka

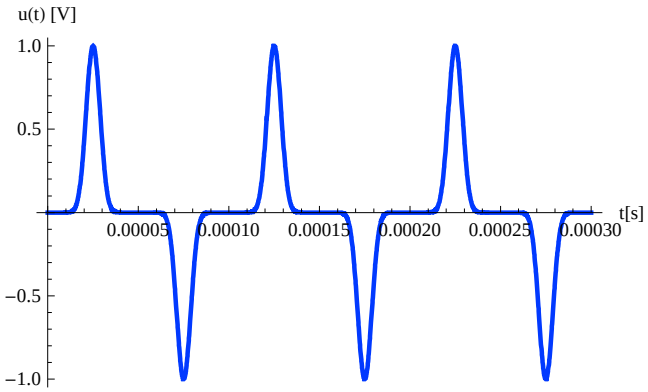
Zadání



In[29]:=
```
ClearAll["Global`*"];
```

In[30]:=
```
f0 = 10^4;
vstup = Sin[2 * Pi * f0 * t]^17;
tau = 1/f0;
tmax = 3 tau;
pl[co_, popis_, barva_] := Plot[Evaluate[co], {t, 0, tmax},
   AxesOrigin → {0, 0}, PlotRange → {Automatic, {-1.05, 1.05}}, PlotStyle →
    Evaluate[{Hue[#], Thickness[0.008]} & /@ barva], AxesLabel → {"t[s]", popis}];
pl1 = pl[vstup, "u(t) [V]", {0.63}]
```

Out[35]=



In[36]:=
```
dos = {R1 → 1 kΩ, c → 1 μF, R2 → 10 kΩ, L → 50 mH, mH → 10^-3, μF → 10^-6, kΩ → 10^3, u[t] → vstup};
```

Popis obvodu

In[37]:=
```
uzel1 = {(u[t] - u1[t])/R1 + iL[t] == c * u1'[t], u1[0] == 0, u2[t] - u1[t] == L * iL'[t], iL[0] == 0};
uzel2 = {iL[t] + u2[t]/R2 == 0};
vse = Union[uzel1, uzel2] //. dos;
```

Řešení

In[40]:=
```
nezname = {u1[t], u2[t], iL[t]};
res = NDSolve[vse, nezname, {t, 0, tmax}][[1]];
```

Zobrazení výsledků

In[42]:=
```
pl[{100 * u2[t] /. res, vstup}, "u(t) , 100u2(t) [V]", {0, 0.63}]
```

Out[42]=