LAPORAN KUIS 4 PMC

Tifany Saulina Nababan

1328070

1. Penurunan Rumus

Penurunan Rumus Tegangan Kapasitor

$$I_C = C \frac{dV_C}{dt}$$

$$\frac{V_i - V_0}{R} = C \frac{\Delta V_0}{\Delta t}$$

$$\frac{V_i - V_0}{RC} = \frac{V_0(t) - V_0(t - \Delta t)}{\Delta t}$$

$$\frac{V_i}{RC} - \frac{V_0}{RC} = \frac{V_0(t)}{\Delta t} - \frac{V_0(t - \Delta t)}{\Delta t}$$

$$\frac{V_0(t)}{\Delta t} + \frac{V_0}{RC} = \frac{V_0(t - \Delta t)}{\Delta t} + \frac{V_i}{RC}$$
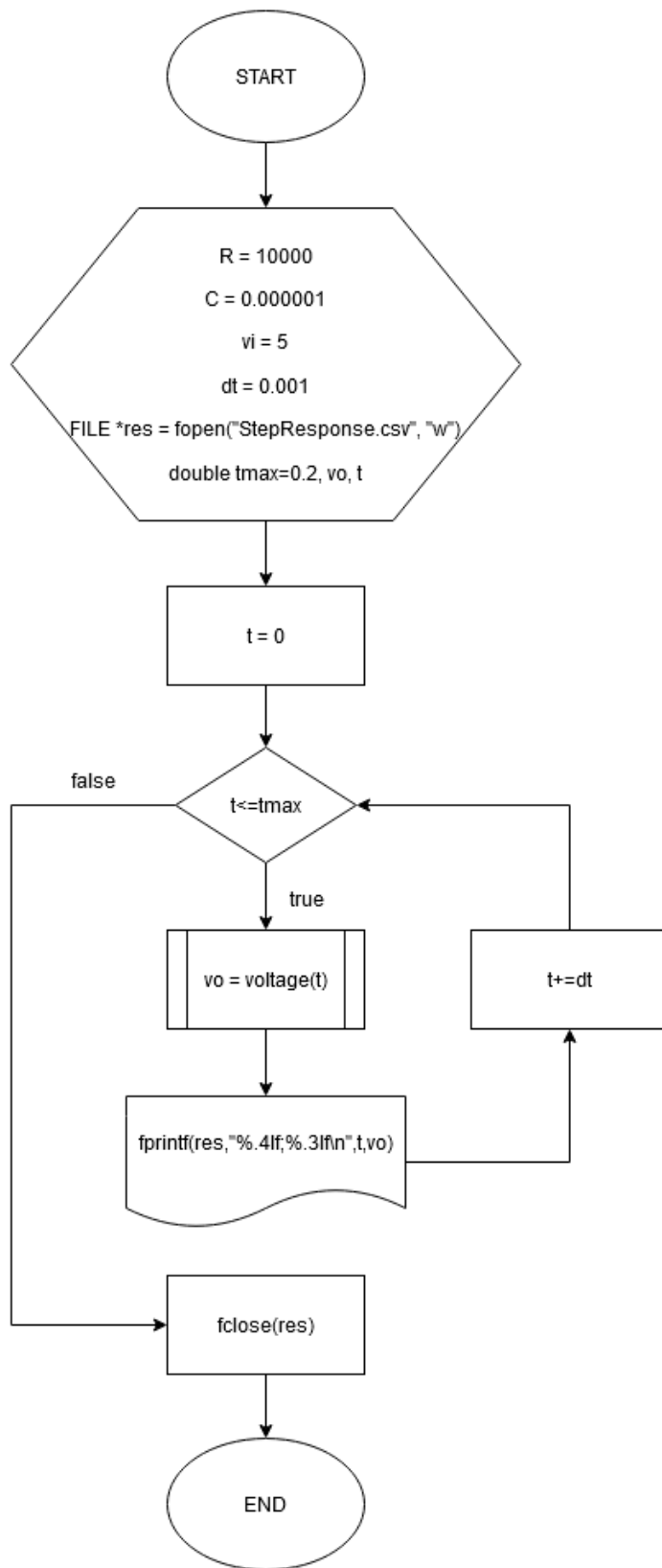
$$\frac{V_0(R + \Delta t)}{RC\Delta t} = \frac{V_0(t - \Delta t) \cdot RC + V_i \cdot \Delta t}{\Delta t \cdot RC}$$

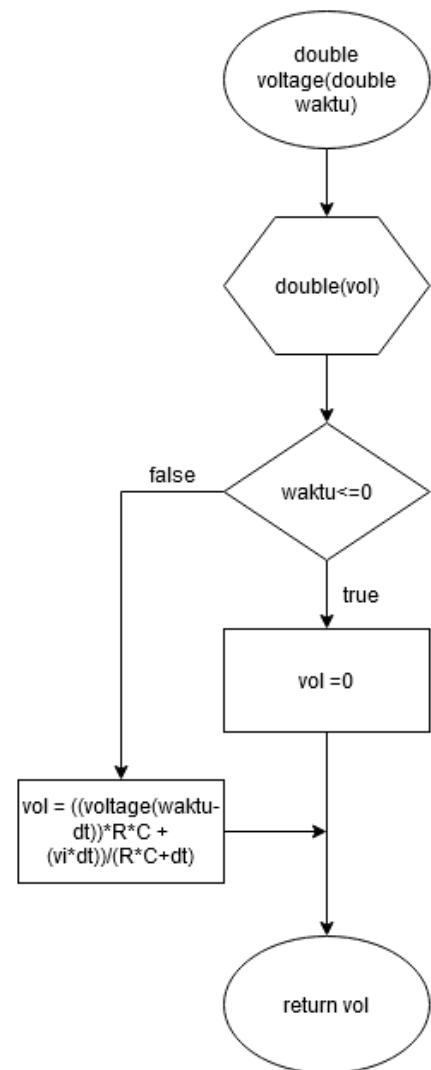$$V_0 = \frac{V_0(t - \Delta t) \cdot RC + V_i \cdot \Delta t}{RC + \Delta t}$$

Tifany S. M
13218070

2. Flowchart

FLOWCHART: main()

START

R = 10000

C = 0.000001

vi = 5

dt = 0.001

FILE *res = fopen("StepResponse.csv", "w")

double tmax=0.2, vo, t

t = 0

t<=tmax

false

true

vo = voltage(t)

t+=dt

fprintf(res,"%.4lf;%.3lf\n",t,vo)

fclose(res)

END

FLOWCHART: voltage(waktu)

double voltage(double waktu)

double(vol)

waktu<=0

false

true

vol =0

vol = ((voltage(waktu-dt))*R*C + (vi*dt))/(R*C+dt)

return vol

3. Chart

Step Response Capasitor