/\*working variables\*/

unsigned long lastTime;

double Input, Output, Setpoint;

double ITerm, lastInput;

double kp, ki, kd;

int SampleTime = 1000; //1 sec

void Compute()

{

unsigned long now = millis();

int timeChange = (now - lastTime);

if(timeChange>=SampleTime)

{

/\*Compute all the working error variables\*/

double error = Setpoint - Input;

ITerm += (ki \* error);

double dInput = (Input - lastInput);

/\*Compute PID Output\*/

Output = kp \* error + ITerm - kd \* dInput;

/\*Remember some variables for next time\*/

lastInput = Input;

lastTime = now;

}

}

void SetTunings(double Kp, double Ki, double Kd)

{

double SampleTimeInSec = ((double)SampleTime)/1000;

kp = Kp;

ki = Ki \* SampleTimeInSec;

kd = Kd / SampleTimeInSec;

}

void SetSampleTime(int NewSampleTime)

{

if (NewSampleTime > 0)

{

double ratio = (double)NewSampleTime

/ (double)SampleTime;

ki \*= ratio;

kd /= ratio;

SampleTime = (unsigned long)NewSampleTime;

}

}