# 5 ANALOG INPUT – Code Snips

**Note: These Code Snips are taken straight from the book chapter; i.e. the “Programme Examples”. In some cases therefore they are not complete programmes.**

/\*Program Example 5.1: Uses analog input to control LED brightness, through DAC output

\*/

#include "mbed.h"

AnalogOut Aout(p18); //defines analog output on Pin 18

AnalogIn Ain(p20) //defines analog input on Pin 20

int main() {

while(1) {

Aout=Ain; //transfer analog in value to analog out, both are type float

}

}

Program Example 5.1: Controlling LED brightness by variable voltage

/\*Program Example 5.2: Uses analog input to control PWM duty cycle, fixed period

\*/

#include "mbed.h"

PwmOut PWM1(p23);

AnalogIn Ain(p20); //defines analog input on Pin 20

int main() {

while(1){

PWM1.period(0.010); // set PWM period to 10 ms

PWM1=Ain; //Analog in value becomes PWM duty, both are type float

wait(0.1);

}

}

Program Example 5.2: Controlling PWM pulse width with potentiometer

/\*Program Example 5.3: Uses analog input to control PWM period.

\*/

#include "mbed.h"

PwmOut PWM1(p23);

AnalogIn Ain(p20);

int main() {

while(1){

PWM1.period(Ain/10+0.001); // set PWM period

PWM1=0.5; // set duty cycle

wait(0.5);

}

}

Program Example 5.3: Controlling PWM frequency with potentiometer

/\*Program Example 5.4: Reads input voltage through the ADC, and transfers to PC terminal. Works for either App Board and Breadboard.

\*/

#include "mbed.h"

Serial pc(USBTX, USBRX); //enable serial port which links to USB

AnalogIn Ain(p20);

float ADCdata;

int main() {

pc.printf("ADC Data Values...\n\r"); [//send](file:///\\send) an opening text message

while(1){

ADCdata=Ain;

pc.printf("%1.3f \n\r",ADCdata); [//send](file:///\\send) the data to the terminal

wait(0.5);

}

}

Program Example 5.4: Logging data to the PC

/\*Program Example 5.5: Inputs signal through ADC, and outputs to DAC. View DAC output on oscilloscope. To demonstrate Nyquist, connect variable frequency signal generator to ADC input. Allows measurement of conversion times, and explores Nyquist limit. \*/

#include "mbed.h"

AnalogOut Aout(p18); //defines analog output on Pin 18

AnalogIn Ain(p20); //defines analog input on Pin 20

DigitalOut test(p5);

float ADCdata;

int main() {

while(1) {

ADCdata=Ain; //starts A-D conversion, and assigns analog value to ADCdata

test=1; //switch test output, as time marker

test=0;

Aout=ADCdata; // transfers stored value to DAC, and forces a D-A conversion

test=1; //a double pulse, to mark the end of conversion

test=0;

test=1;

test=0;

//wait(0.001); //optional wait state, to explore different cycle times

}

}

Program Example 5.5: Estimating data conversion times