Εργαστήριο Προηγμένοι Μικροεπεξεργαστές

Αναφορά 2ης Εργαστηριακής Άσκησης

# **Ομάδα Β3**

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| Φοιτητές | ΑΜ |
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**Μέρος Α**

**Σημείωση:**

Το βήμα αύξησης του cnt έχει τεθεί στό 20 και όχι 1 που ζητάει η εκφώνηση για να φαίνονται πιο εύκολα τα αποτελέσματα.

Πείραμα σε ΑΤ91

#include <fuct1.h>

#include <stdio.h>

#include <stdlib.h>

#include <sys/ioct1.h>

#include <sys/mman.h>

#include <sys/stat.h>

#include <sys/types.h>

#include <unistd.h>

#include <header.h>

PIO \*pioa = NULL;

void FIQ\_handler(void);

AIC \*aic = NULL;

TC \*tc = NULL;

unsigned int cnt = 100;

int main(int argc, const char \*argv[]) {

unsigned int tmp;

unsigned int bitmask;

unsigned int next;

STARTUP;

pioa->OER = 0x10;

pioa->PER = 0x10;

tmp = pioa->ISR;

while (1) {

switch (tmp) {

case '00':

CLEANUP;

return 0;

case '01':

cnt += 20;

break;

case '10':

cnt -= 20;

break;

}

if (cnt > 100) {

cnt = 100;

}

if (cnt < 0) {

cnt = 0;

}

dimiourgia\_pwm\_pulse(10, cnt);

}

CLEANUP;

return 0;

}

void dimiourgia\_pwm\_pulse(int kukloi, int duty\_kuklos) {

int i;

for (i = 0; i < kukloi; i++) {

int x;

for (x = 0; x < duty\_kuklos; x++) {

pioa->CODR = 0x10;

}

for (x = duty\_kuklos; x < 100; x++) {

pioa->SORD = 0x10;

}

}

}

void FIQ\_handler(void) {}

Πείραμα σε Tinkercad

Το κύκλωμα φαίνεται εδώ:

<https://www.tinkercad.com/things/jfWBMqzNBgK-askhsh-2-meros-a/editel>

#define PRES 0

#define RELEAS 1

unsigned int prev\_but1\_state;

unsigned int prev\_but2\_state;

int cnt;

void setup() {

Serial.begin(9600);

pinMode(5, OUTPUT);

pinMode(3, INPUT\_PULLUP);

pinMode(2, INPUT\_PULLUP);

prev\_but1\_state = RELEAS;

prev\_but2\_state = RELEAS;

cnt = 100;

}

void loop() {

unsigned int but1\_state = digitalRead(2);

if (but1\_state == RELEAS && prev\_but1\_state == PRES) {

cnt+=20;

}

unsigned int but2\_state = digitalRead(3);

if (but2\_state == RELEAS && prev\_but2\_state == PRES) {

cnt-=20;

}

prev\_but1\_state = but1\_state;

prev\_but2\_state = but2\_state;

if (cnt > 100) {

cnt = 100;

}

if (cnt < 0) {

cnt = 0;

}

dimiourgia\_pwm\_pulse(10, cnt);

Serial.println(cnt);

}

void dimiourgia\_pwm\_pulse(int kukloi, int duty\_kuklos) {

int i;

for (i=0; i<kukloi; i++) {

int x;

for (x=0; x<duty\_kuklos; x++) {

digitalWrite(5, LOW);

}

for (x=duty\_kuklos; x<100; x++) {

digitalWrite(5, HIGH);

}

}

}

**Μέρος Β**

Πείραμα σε ΑΤ91

#include <fuct1.h>

#include <stdio.h>

#include <stdlib.h>

#include <sys/ioct1.h>

#include <sys/mman.h>

#include <sys/stat.h>

#include <sys/types.h>

#include <unistd.h>

#include <header.h>

PIO \*pioa = NULL;

void FIQ\_handler(void);

AIC \*aic = NULL;

TC \*tc = NULL;

int main(int argc, const char \*argv[]) {

unsigned int tmp;

unsigned int bitmask;

unsigned int next;

STARTUP;

pioa->OER = 0x10;

pioa->PER = 0x10;

tmp = pioa->ISR;

while ((tmp = getchar()) != 'e') {

int i;

for (i = 0; i <= 100; i += 10) {

dimiourgia\_pwm\_pulse(100, i);

}

for (i = 100; i > 0; i -= 10) {

dimiourgia\_pwm\_pulse(100, i);

}

}

CLEANUP;

return 0;

}

void dimiourgia\_pwm\_pulse(int kukloi, int duty\_kuklos) {

int i;

for (i = 0; i < kukloi; i++) {

int x;

for (x = 0; x < duty\_kuklos; x++) {

pioa->CODR = 0x10;

}

for (x = duty\_kuklos; x < 100; x++) {

pioa->SORD = 0x10;

}

}

}

void FIQ\_handler(void) {}

Πείραμα σε Tinkercad

Το κύκλωμα φαίνεται εδώ:

<https://www.tinkercad.com/things/71Xb1tVSs8o-askhsh-2-meros-b/editel>

#define PRES 0

#define RELEAS 1

unsigned int prev\_but\_state;

int state;

void setup() {

Serial.begin(9600);

pinMode(2, INPUT\_PULLUP);

pinMode(5, OUTPUT);

state = 1;

prev\_but\_state = RELEAS;

}

void loop() {

unsigned int but\_state = digitalRead(2);

if (but\_state == RELEAS && prev\_but\_state == PRES) {

while (1) {

int j;

for (j=0; j<=100; j+=10) {

Serial.println(j);

dimiourgia\_pwm\_pulse(100, j);

}

for (j=100; j>0; j-=10){

Serial.println(j);

dimiourgia\_pwm\_pulse(100, j);

}

}

}

prev\_but\_state = but\_state;

}

void dimiourgia\_pwm\_pulse(int kukloi, int duty\_kuklos) { int i;

for (i=0; i<kukloi; i++) {

int x;

for (x=0; x<duty\_kuklos; x++) {

digitalWrite(5, LOW);

}

for (x=duty\_kuklos; x<100; x++) {

digitalWrite(5, HIGH);

}

}

}

**Μέρος Γ**

Πείραμα σε Tinkercad

To κύκλωμα φαίνεται εδώ:

<https://www.tinkercad.com/things/aXg5ob6ENMu-askhsh-2-meros-g/editel>

#define PRES 0

#define RELEAS 1

unsigned int prev\_but\_state;

int state;

int game\_lvl;

volatile int cnt = 100;

volatile bool win = false;

void setup() {

Serial.begin(9600);

pinMode(2, INPUT\_PULLUP);

pinMode(5, OUTPUT);

attachInterrupt(digitalPinToInterrupt(2), buttonUpdate, FALLING);

prev\_but\_state = RELEAS;

game\_lvl = 0;

}

void loop() {

int rounds\_won = 0;

for (int j = 0; j < 3; ++j) {

bool result = playround();

if (result) {

++rounds\_won;

}

}

Serial.print(rounds\_won);

}

void buttonUpdate() {

if (cnt == 0) {

win = true;

}

}

bool playround() {

int cur\_try = 0;

cnt = 100;

while (1) {

dimiourgia\_pwm\_pulse(10 - game\_lvl, cnt);

if (win) {

win = false;

cur\_try = 0;

++game\_lvl;

return true;

}

cnt--;

if (cnt < 0) {

++cur\_try;

cnt = 100;

if (cur\_try >= 3) {

return false;

}

}

}

}

void dimiourgia\_pwm\_pulse(int kukloi, int duty\_kuklos) {

int i;

for (i = 0; i < kukloi; i++) {

int x;

for (x = 0; x < duty\_kuklos; x++) {

digitalWrite(5, HIGH);

}

for (x = duty\_kuklos; x< 100; x++) {

digitalWrite(5, LOW);

}

}

}