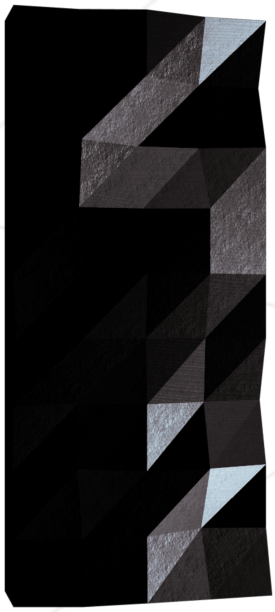

Embedded pool

Module08 : SPI

contact@42chips.fr

Summary: The SPI Who Loved Me

Version: 1

Chapter I

Introduction

"James Bond: Casino Royale" is a spy film released in 2006, based on the first novel in the James Bond series written by Ian Fleming. The film was directed by Martin Campbell and stars Daniel Craig in the lead role of James Bond.

The story begins when Bond is sent on a mission to confront Le Chiffre, a banker for international terrorists. Bond must prevent Le Chiffre from winning a high-stakes poker tournament at the Casino Royale in Montenegro, in order to deprive the terrorists of their funding.

Bond is aided by Vesper Lynd, a government agent who is responsible for managing the mission's money. However, Bond and Vesper soon find themselves confronted with deadly dangers as their mission becomes more complicated.

The film is known for its intense action scenes and its raw portrayal of James Bond, which differs from previous interpretations of the character. The film was a critical and commercial success, and relaunched the James Bond franchise with Daniel Craig in the lead role.

"James Bond: Casino Royale" is the best Bond film because of its intense action, captivating scenes, and Daniel Craig's raw portrayal of Bond. It is a film that relaunched the franchise with brilliance and achieved great critical and commercial success.

#007 #CasinoRoyale #DanielCraig #BestBond

Chapter II

General instructions

Unless explicitly stated otherwise, the following instructions will be valid for all assignments.

- The language used for this project is C.
- It is not necessary to code according to the 42 norm.
- The exercises are ordered very precisely from the simplest to the most complex. Under no circumstances will we consider or evaluate a complex exercise if a simpler one is not perfectly successful.
- You must not leave any files other than those explicitly specified by the exercise instructions in your directory during peer evaluation.
- All technical answers to your questions can be found in the `datasheets` or on the Internet. It is up to you to use and abuse these resources to understand how to complete your exercise.
- You must use the datasheet of the microcontroller provided to you and comment on the important parts of your program by indicating where you found the clues in the document, and if necessary, explaining your approach. Don't write long blocks of text, keep it clear.
- Do you have a question? Ask your neighbor to the right or left. You can ask in the dedicated channel on the Piscine's Discord, or as a last resort, ask a staff member.

Chapter III

Red Eye

	Exercise 00
SPI Rouge	
Turn-in directory : $ex00/$	
Files to turn in : `Makefile, *.c, *.h`	
Allowed functions : `avr/io.h, util/delay.h, avr/interrupt.h`	

Write a program that initializes SPI as master and turns on the LED D6 in red.

	Exercise : 01
Blue Squadron Centurion	
Turn-in directory : $ex01/$	
Files to turn in : `Makefile, rgb.c`	
Forbidden functions : `None`	

Do you remember exercise 1 from Module06? Let's do it again!

- You will have to write a program that controls the RGB LED D6.
- Here is a table of colors that must be displayed successively.

name	R#	G#	B#	color
red	ff	0	0	
green	0	ff	0	
blue	0	0	ff	
yellow	ff	ff	0	
cyan	0	ff	ff	
magenta	ff	0	ff	
white	ff	ff	ff	

- In a loop and changing color every second.

	Exercise 02
Cylon Centurion	
Turn-in directory : $ex02/$	
Files to turn in : `Makefile, *.c, *.h`	
Allowed functions : `avr/io.h, util/delay.h, avr/interrupt.h`	

Write a program that turns on the LEDs D6 to D8 successively.

- The total period of one cycle should be 1 second.
- The duration of each LED lighting should be 250ms.

Chapter IV

You throw quite a party.

	Exercise 03
Imperious Leader	
Turn-in directory : $ex03/$	
Files to turn in : `Makefile, *.c, *.h`	
Allowed functions : `avr/io.h, util/delay.h, avr/interrupt.h`	

Read the value of RV1 with your ADC.

- The LEDs D6 to D8 should light up according to the value of RV1 as a digital gauge would display it.
  - LED D6: 33%
  - LED D7: 66%
  - LED D8: 100%

Chapter V

Welcome to the party, pal.

	Exercise 05
IL-Series	
Turn-in directory : $ex05/$	
Files to turn in : `Makefile, *.c, *.h`	
Allowed functions : `avr/io.h, util/delay.h, avr/interrupt.h`	

- You must create a program that listens on the serial port.
- This program should modify the color of the LEDs D6, D7 or D8 based on the value sent by the standard input.
- You should display an RGB HEX color in the format `#RRGGBBDX`.
- `DX` will correspond to the value of the LED you wish to modify (D6/D7/D8).
- If the program reads `#FULLRAINBOW` on the standard input, the LEDs should light up according to a wheel() function that you will have created during exercise 2 of Module06.
- The program should display an error message if the parameter sent on the standard input is not readable with the usage.

```
#000000D6
#35aaaaD7
#221299D8
...
#FULLRAINBOW
```

	Exercise 05
Lucifer	
Turn-in directory : $ex05/$	
Files to turn in : `Makefile, *.c, *.h`	
Allowed functions : `avr/io.h, util/delay.h, avr/interrupt.h`	

- Write a program that will turn on the 3 LEDs D6, D7, and D8 and address the following issues:
  - The potentiometer RV1 is used to change the value of one of the 3 RGB primary colors.
  - The button SW1 is used to validate the value of the potentiometer and switch to the next primary color.
  - The button SW2 is used to switch from one LED to the next.