Okay, we'll split the document on three parts:

- Sources of information about WS2812b;
- How to use library;
- Detailed information about library;
- Error handling;

Sources of information about WS2812b:

- Data sheet link: https://cdn-shop.adafruit.com/datasheets/WS2812B.pdf
- Example what should be done, but with STM32F411 instead of Arduino. (https://www.youtube.com/watch?v=9hJyyUTflXA)

How to use library:

- Create a project with so many pins in Output state as many diode lines you want to plug in;
- Take file libFiles/ws2812.c and put it into your project inside Src folder;
- Take file libFiles/ws2812.h and put it into your project inside Inc folder;
- Write following string in your main.c file: (#include "ws2812.h") most likely in "/* USER CODE BEGIN Includes */ - /* USER CODE END Includes */" section;
- Now you can use the libraries methods;

Detailed information about library:

- Library has 15 methods and one Structure to work with and is OOP-like (as much as C language allows). Methods are following (with blue we'll mark methods which are for user and red – which are not likely to be used by user, e.g. were used by developer and can lead to troubles):
- delay_asm() - makes microsecond delays;
- send_byte() - sends byte to the diode creating needed signals;

- set_tape() - creates and returns object of your tape of diodes;
- reset() - clears all the diodes of the and switches them off;
- light_all_diod_tape() - lights all the diodes to certain colour by RGB model;
- set_buffer() - sets buffer of the tape colour values in chosen positions with chosen RGB colour;
- light_from_buffer() - lights diodes with all values in buffer;
- light_single_diod() - lights single diod with RGB model;
- *get_colour() - returns a pointer of array with three integer values of colour: RGB.
- pattern_colouring – lights chosen diodes with a defined pattern;
- decrease_colour_brightness() - sets colour brightness to a given percentage out of current;
- increase_colour_brightness() - sets colour brightness to a given percentage out of max;
- ErrorHandler() - raises errors (more, later);
- light_diod_tape() - lights chosen diodes with given colour;
- set_pattern_colouring() - sets pattern to a buffer, but does not light the tape;

Error handling:

- Error is going to be represented with blinking red diodes.
- Counting how many diodes are blinking, you will be able to identify the problem type and fix it.
- There are 6 types of problem (i.e. 6 diodes is the biggest number to be blinking):
- **Type 1: bad value for RGB in method (must be in range 0 <= x <= 255);**
- **Type 2: bad indexes in method (must be >= 0 and <= size of tape);**
- **Type 3: same as type 2, but for *get_colour() method;**

- **Type 4: bad pattern function usage;**
- **Type 5: problems with decreasing brightness;**
- **Type 6: problems with increasing brightness;**

All sufficient information has been told already, so thank you for attention!