2 Questions

Question 1: Assume you have a function that can give microsecond of delay. How you can adjust the brightness of an LED using the delay function?

Question 2: What are the ports connected to onboard LEDs (Port connected to Red, Green and Blue LEDs) on FRDM-KL25Z board?

Question 3: Assume we reduced the clock of the processor to 100 Hz and processor executes 1 instruction per clock. Given the function below, do you expect a precise 1-second delay? Explain why or why not.

```c
void Delay(volatile unsigned int time_del) {
  while (time_del--)
    {
  }
}

void main(){
  Delay(100);
}
```

Question 4: Explain pull-up and pull-down resistor. Why are they needed?

Answers:

Q1- We can adjust an LED's brightness by varying the on/off time ratio within a cycle (duty cycle). Shorter delays for the 'on' state makes the LED appear more darker. And shorter delays for the off state makes the LED brighter

Q2- Red LED Cathode: PTB18; Green LED Cathode: PTB19; Blue LED Cathode: PTD1 (See Table 5)

Q3- Since there is call and return instructions each time we call the delay function; a delay function that counts to 100, might not precisely yield a 1 second delay because of these additional instructions.

Q4- pull-up and pull-down resistors are used to ensure a known state for a digital signal. A pull-up resistor connects to the power supply to define a default 'high' state, while a pull-down connects to ground to define a 'low' state. They prevent undefined states (floating) when inputs are disconnected.

Table 5. RGB LED Signal Connections

RGB LED	KL25Z128
Red Cathode	PTB18
Green Cathode	PTB19
Blue Cathode	PTD1 [1]