```c
/*
 * asynchronous_sw_read.c
 *
 * Created: 3/18/2021 5:47:32 PM
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 */

#define BAUD_RATE 4800L                                                 // baud rate.
#define F_CPU 4000000UL                                                 // 4 MHz clock.
#include <avr/io.h>
#include <util/delay.h>

uint8_t USART_sw_read();                                                //  declaration for read function.

char c;                                                                 //  global char variable.

int main(void)
{
    while (1)
    {
        c = (char) USART_sw_read();                                     // read UART input to c.
    }
}

uint8_t USART_sw_read() {
    PORTB.DIRCLR = PIN1_bm;                                             // PB1 set as input.

    uint8_t d;                                                          // bit time.
    if (BAUD_RATE == 4800L) {
        d = 48;
    } else if (BAUD_RATE == 9600L) {
        d = 99;
    } else if (BAUD_RATE == 19200L) {
        d = 201;
    } else return 0x00;

    uint8_t data = 0;
    uint8_t reading = 1;

    while (reading == 1) {
        while ((PORTB_IN & PIN1_bm) == 1) {}                                //  wait for falling edge.
```

```
42          _delay_us(d/2);
43          if ((PORTB_IN & PIN1_bm) != 0) continue;                    //  ↪
              check for false start.
44          _delay_us(d);                                               //  ↪
              delay for bit time.
45
46          uint8_t i = 0;
47          for (i; i < 8; ++i) {
48              data >>= data | ((PORTB_IN | PIN1_bm) << 6);             //  ↪
                  read little endian input.
49              _delay_us(d);                                           //  ↪
                  delay for bit time.
50          }
51          reading = 0;
52      }
53      return data;
54  }
55
```