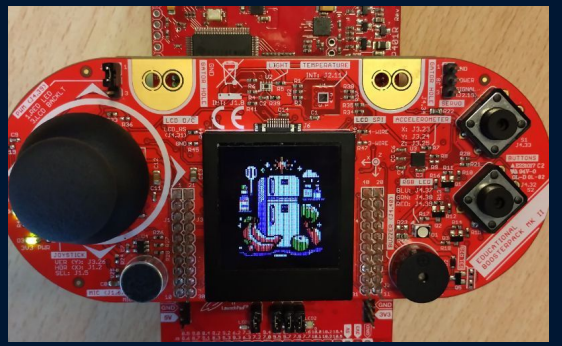
Fridge Guardian

Embedded Software for the Internet of Things



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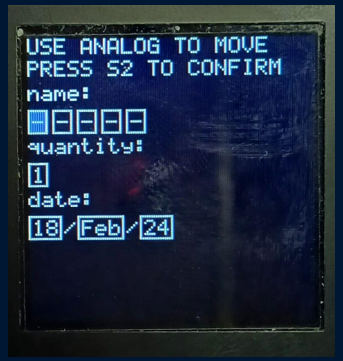
Problem Statement

Fridge Guardian =
Enhanced food storage experience

Expired food in your fridge ?
No more !

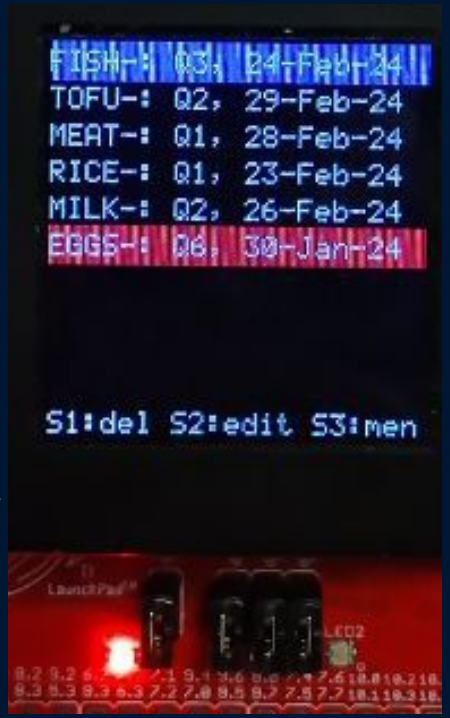
Working Scheme

The user interacts with the system using the joystick and the buttons. To go back to the menu, the joystick must be pressed.



The joystick is used to select a character and to go from one to another.

1. Input data



Use the joystick to move among food items. Buttons are used either to delete or to modify an item.

Date is checked hourly. Once a food item expired, it is red-highlighted in the food list and a red LED is toggle.

2. Get a red LED if a food item expired

Software Architecture

Data Processing | Interrupt Service Routine (ISR) | User Interface(UI)

```c
typedef struct FoodItem_t {
    uint8_t name[MAX_FOOD_NAME_LENGTH];
    uint8_t quantity;
    uint8_t day;
    uint8_t month;
    uint8_t year;
}FoodItem_t;
```

A structure is defined to store a food item information

```c
void RTC_C_IRQHandler(void)
{
    uint32_t status;

    status = RTC_C_getEnabledInterruptStatus();
    RTC_C_clearInterruptFlag(status);
    //interrupt handler for RTC event
    //called every time a new day arrives
    if (status & RTC_C_TIME_EVENT_INTERRUPT) //if
    {
        expiredFood();
    }
}
```

Mainly two ISR :

- ADC interrupt : handle interactions with the joystick
- RTC interrupt : red LED if expired food

UI on LCD screen is designed to be easy to use.
Two contexts are used : one is set for the background, the other for the foreground (text highlight)

Conclusion and upgrades

Temperature and Humidity sensor

To have real-time insights of temperature and humidity inside the fridge and adapt them automatically

Scanning a product

To avoid entering data by hand and to offer more user-friendly experience

Notifications

To prevent having expired food product in a more efficient manner