

Polling vs Interrupts

CM0506 – Small Embedded Systems

Dr Alun Moon

Department of Computer and Information Science

Lecture 5

Polling

Periodically checking devices

```
while(1) {  
    wait(200);  
    if (buttonPressedAndReleased(&pin[JLEFT])) {  
        flashing[LED1] = !flashing[LED1];  
    }  
    if (buttonPressedAndReleased(&pin[JDOWN])) {  
        flashing[LED2] = !flashing[LED2];  
    }  
}
```

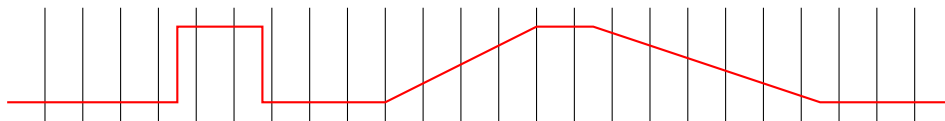
- Check for condition of device
- if data is available
- read the device or do something
- repeat

Polling

```
bool buttonPressedAndReleased(gpioPin_t *pin) {  
    bool result = false;  
    if (gpioPinVal(pin) == 0) {  
        while (gpioPinVal(pin) == 0) {  
            /* skip */  
        }  
        result = true;  
    }  
    return result;  
}
```

- Software has to keep checking status of device

Polling



Level sensitive Test value of input at sample points

- what is 1 or 0

Edge sensitive Test for changes in level

Rising Edge level goes from low (0) to high (1)

Falling Edge level goes from high (1) to low (0)

What happens if the signal changes between sample points?

Polling

- Also called **Synchronous** I/O
- For many applications: most polled samples will mean “nothing happening here”
- Considerable time may be spent executing code for long intervals when no input is available to work on
- This may be OK if there is nothing else to do ... but ...

Polling more than one input

- What if there are many inputs which have to be sampled?

Polling more than one input

- What if there are many inputs which have to be sampled?
- The application will have to scan each input and react if the input is active (interesting)

Polling more than one input

- What if there are many inputs which have to be sampled?
- The application will have to scan each input and react if the input is active (interesting)
- Manageable under some circumstances

Polling more than one input

- What if there are many inputs which have to be sampled?
- The application will have to scan each input and react if the input is active (interesting)
- Manageable under some circumstances
- It may become difficult if the number of inputs is large and other tasks require processing.

Polling more than one input

- What if there are many inputs which have to be sampled?
- The application will have to scan each input and react if the input is active (interesting)
- Manageable under some circumstances
- It may become difficult if the number of inputs is large and other tasks require processing.
- System may be slow to react to inputs

Polling more than one input

- What if there are many inputs which have to be sampled?
- The application will have to scan each input and react if the input is active (interesting)
- Manageable under some circumstances
- It may become difficult if the number of inputs is large and other tasks require processing.
- System may be slow to react to inputs
 - you have to wait until the next sample for that input