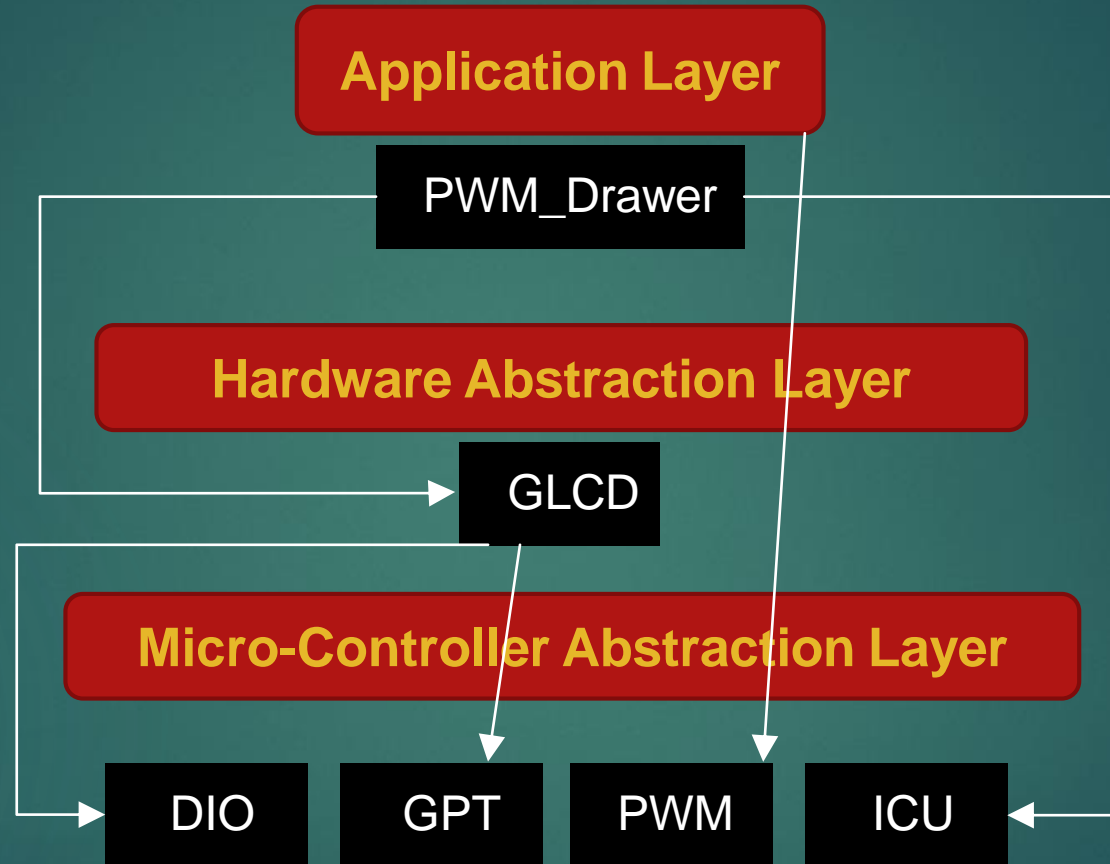


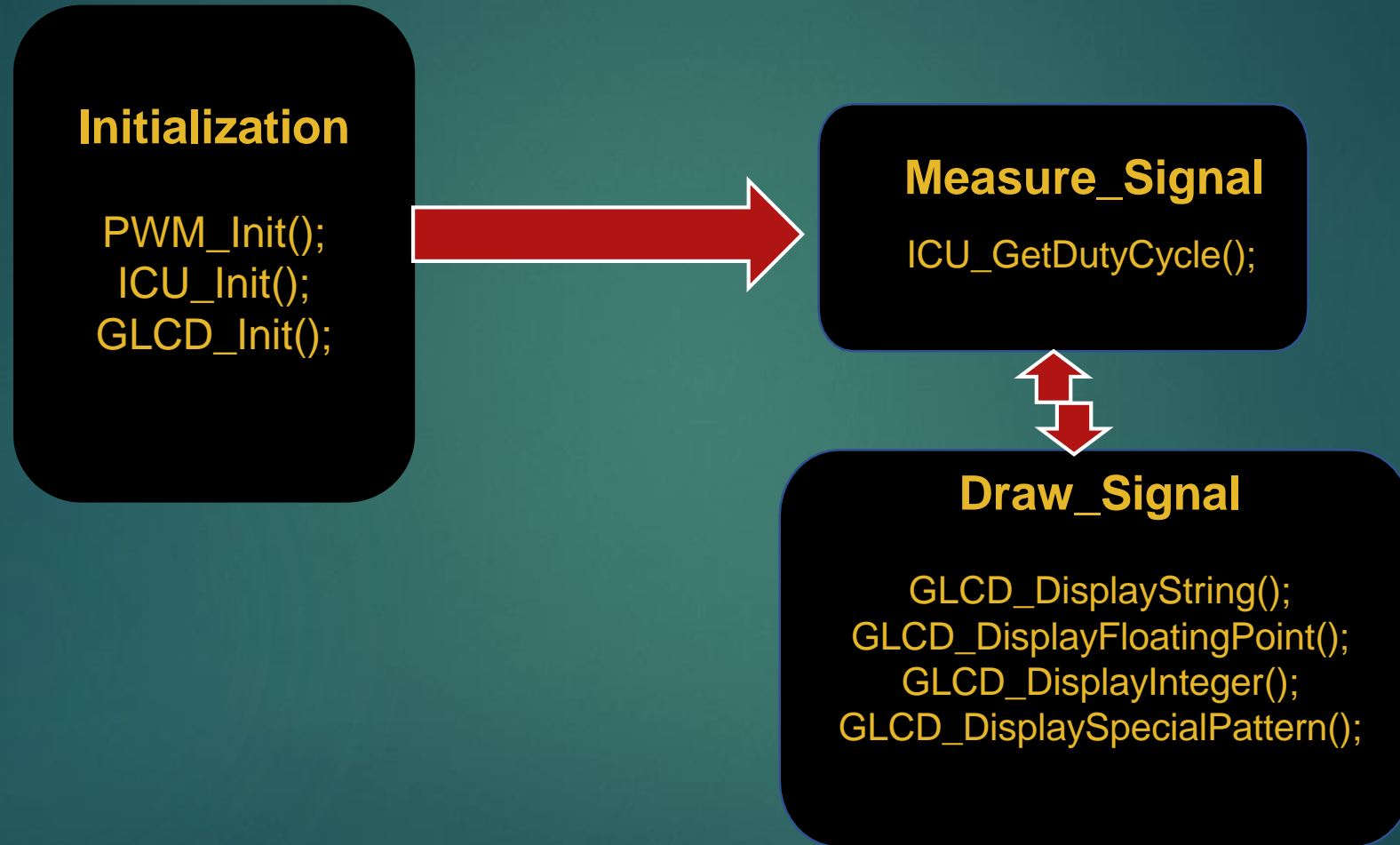
PWM Drawer using Graphical LCD and ATmega32

AMIT Graduation Project
Presented by: Eng. Abdelrahman ahmed safina
OCT 9 Group

Layered Architecture



Flowchart



Flowchart Continued (1)

Measure_Signal

ICU_GetDutyCycle();

Clear Input Capture Flag Set
Trigger Edge: RISING_EDGE

Wait for Input Capture → i.e. Start of Cycle

Clear Input Capture Flag and Timer Counter
Set Trigger Edge: FALLING_EDGE

Wait for Input Capture → i.e. High Count

Clear Input Capture Flag and Timer Counter
Set Trigger Edge: RISING_EDGE

Wait for Input Capture → i.e. Low Count

$$\text{Duty Cycle \%} = \frac{\text{High Time}}{\text{Period Time}} \times 100$$

$$\text{High Time ms} = \frac{\text{High Count} * \text{Prescaler} * 10^3}{F_{CP}}$$

$$\text{Period Time ms} = \frac{(\text{High Count} + \text{Low Count}) * \text{Prescaler} * 10^3}{F_{CP}}$$

Flowchart Continued (2)

Draw_Signal

```
GLCD_DisplayString();  
GLCD_DisplayFloatingPoint();  
GLCD_DisplayInteger();  
GLCD_DisplaySpecialPattern();
```

Choose a scale (milliseconds
to pixel) as $\frac{\text{Period Time}}{5}$

GLCD Line 0: Display Frequency Value in kHz.

GLCD Line 1: Display Duty Cycle Value in %.

GLCD Line 4: Display Period Time Value in
milliseconds.

GLCD Line 5: Display Arrow on First Cycle
Period Time.

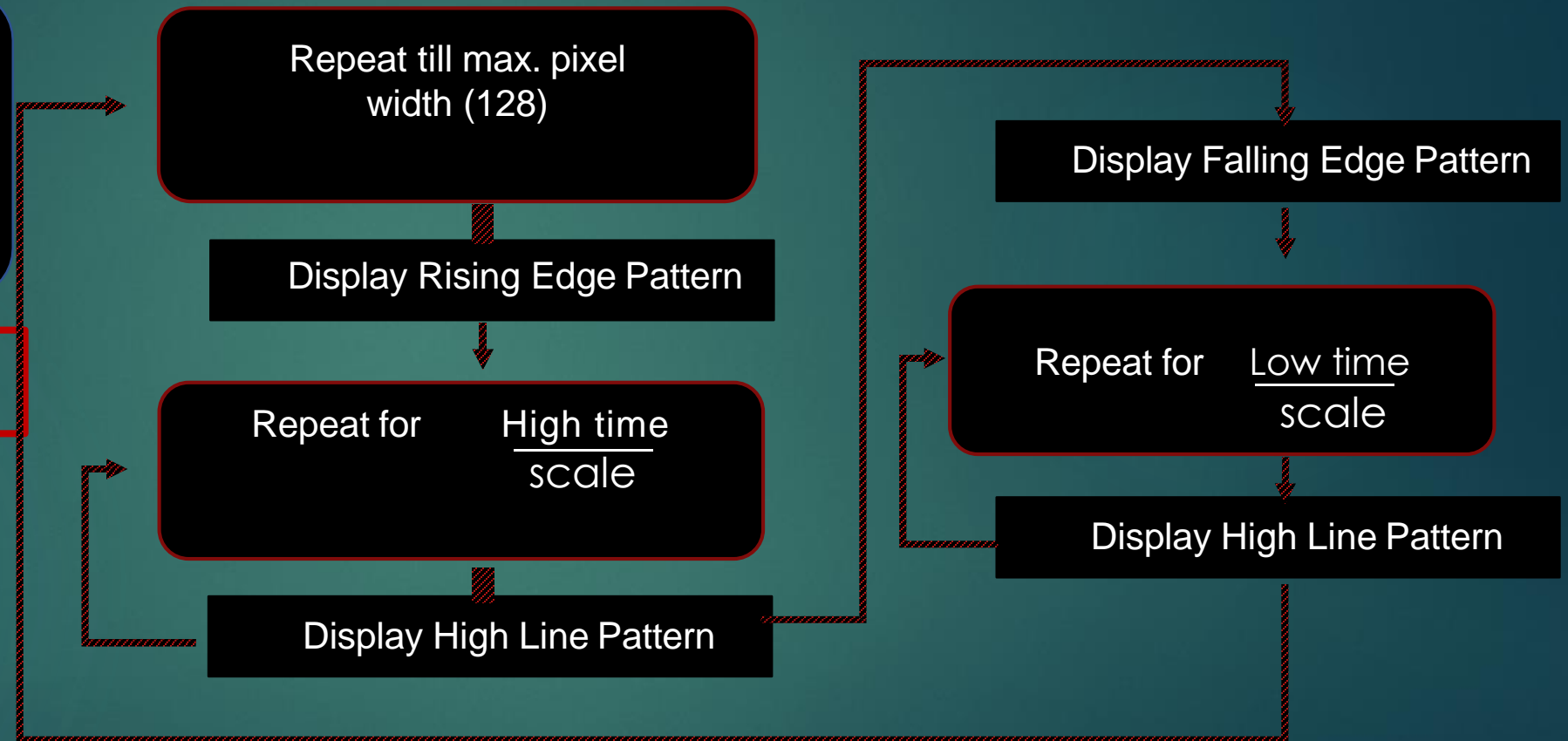
GLCD Line 6: Display the PWM signal shape.

Flowchart Continued (3)

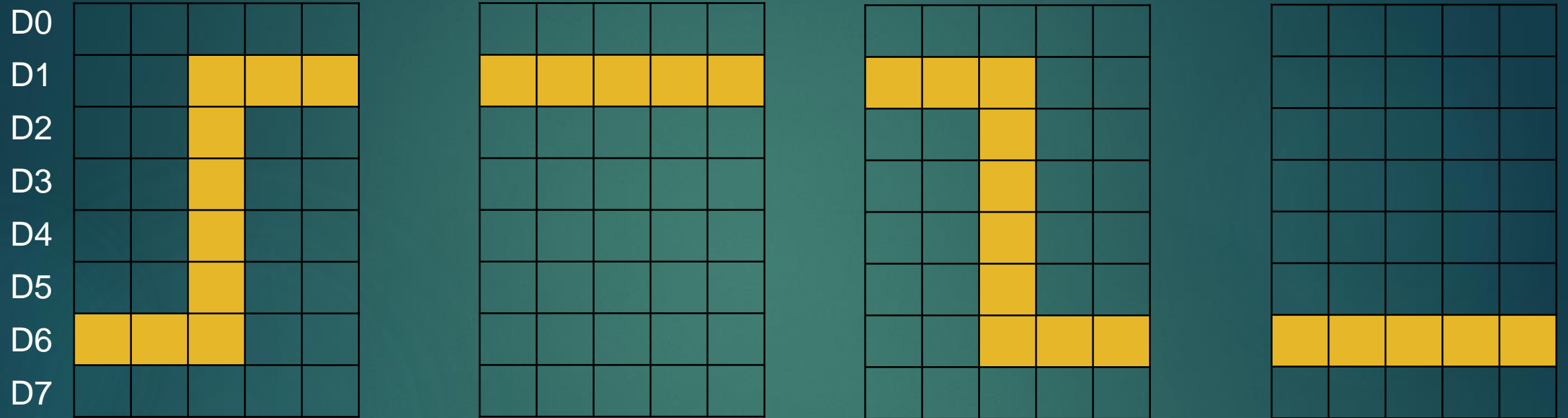
Draw_Signal

al
GLCD_DisplayString();
GLCD_DisplayFloatingPoint();
GLCD_DisplayInteger();
GLCD_DisplaySpecialPattern();

GLCD Line 6: Display the PWM
signal shape.



Special Patterns on Graphical LCD



Special Patterns on Graphical LCD

D0
D1
D2
D3
D4
D5
D6
D7

