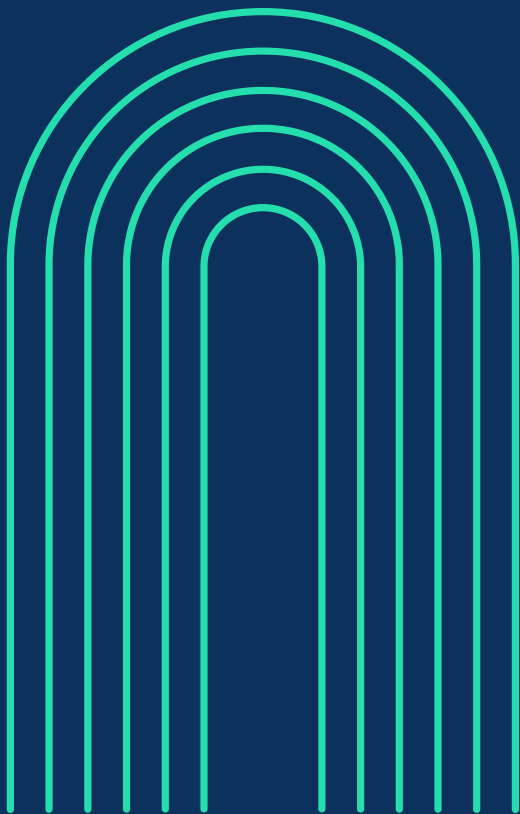


SFE – CSD



Embedded Systems

Assignment One



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BN:



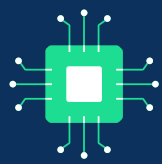
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THE DIFFERENT MICROCONTROLLER FAMILIES AND BRANDS.

1. **TM4C123GH6PM**

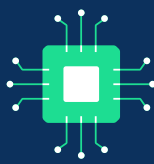
The TM4C123GH6PM is a high-performance microcontroller from Texas Instruments' Tiva C Series, equipped with an ARM Cortex-M4F processor and a floating-point unit (FPU) for efficient mathematical processing. It is designed for real-time control systems and is ideal for industrial and consumer applications that require robust performance and versatile peripheral options.

2. **STM32F103C8T6**

Part of the STM32F103x medium-density series, the STM32F103C8T6 is powered by an ARM® Cortex®-M3 32-bit RISC core running at 72 MHz. It includes advanced I/O, two 12-bit ADCs, three 16-bit timers, PWM, and communication interfaces like I2C, SPI, USART, USB, and CAN.

3. **ATmega328**

Known for its use in Arduino, the ATmega328 is a popular 8-bit AVR microcontroller with 32KB of flash memory. It provides ease of programming and a strong community backing, making it a favorite for many designers.



THE DIFFERENT MICROCONTROLLER FAMILIES AND BRANDS.

4. **PIC16F877A**

A favorite in the PIC microcontroller family, the PIC16F877A is still widely used by beginners and experts in embedded development. Despite being seen as outdated by some, it remains popular for its simplicity and effectiveness.

5. **ATtiny85**

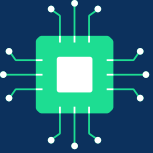
Known for its small size and low power consumption, the ATtiny85 is ideal for projects requiring minimal GPIOs and compact design. It's especially appreciated in the maker community for its versatility.

6. **MSP430G2452**

The MSP430 series by Texas Instruments is renowned for low power consumption. The MSP430G2452, based on a 16-bit RISC CPU, is a powerful yet affordable option for many embedded systems.

7. **ESP8266**

Espressif's ESP8266 revolutionized IoT by integrating Wi-Fi with microcontroller functionality at an affordable price. With its large community support and pre-certified modules, it's a popular choice for wireless projects



THE DIFFERENT MICROCONTROLLER FAMILIES AND BRANDS.

8. **ESP32**

As an advanced version of the ESP8266, the ESP32 includes dual-mode Bluetooth and Wi-Fi capabilities. With built-in security features and power management, it's ideal for modern IoT applications

9. **ATmega32U4**

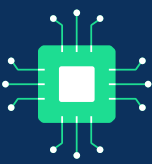
The ATmega32U4 is a low-power 8-bit AVR® microcontroller with USB 2.0 functionality, making it popular for projects needing direct USB connection. It's used in many custom keyboards and USB devices.

10. **STM8S103F3**

The STM8S103F3 provides an 8-bit core with advanced peripherals in a compact size, offering a balance of performance and low power consumption. It's a great choice for small, cost-sensitive projects.

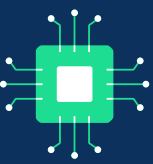
11. **NXP LPC1768**

Based on the ARM Cortex-M3 core, the NXP LPC1768 is designed for embedded applications requiring high performance and low power. It comes with a wide range of peripherals, making it suitable for a variety of tasks.



COMPARISON BETWEEN PIC16F877A AND TM4C123GH6PM

POC	PIC16f877A	TM4C123GH6PM
Core Architecture	8-bit PIC architecture	32-bit ARM Cortex-M4F
Performance	Up to 20 MHz	Up to 80 MHz
Flash Memory	14 KB	256 KB
SRAM	368 bytes	32 KB
EEPROM	256 bytes	supports external memory
Timers	3 (8-bit and 16-bit)	6 general-purpose timers
GPIO Pins	33	43
Applications	Home automation, simple I/O control, basic embedded systems	Industrial automation, motor control, real-time systems, consumer electronics



COMPARISON BETWEEN PIC16F877A AND TM4C123GH6PM

POC	PIC16f877A	TM4C123GH6PM
Power Consumption	Low power consumption for small-scale applications	Moderate, but optimized for high-performance tasks
Floating-Point Unit	Not available	Available
Real-Time Applications	Limited	Ideal for real-time and high-speed applications
Cost	Lower cost.	Higher Cost.
Development Boards	PIC Development Boards	Tiva C Series LaunchPad