DIGITAL LOGIC DESIGN

(EL-1005)

SPRING-2024



BS-CS-2A

COURSE INSTRUCTOR

ENGR. MUHAMMAD AFNAN

PROJECT PROPOSAL

ARDUINO CALCULATOR

MEMBER

K230907 ZUBAIR AHMED

K230773 MEHWISH ZEHRA

BRIEF OVERVIEW/INTRODUCTION

The Arduino Calculator is a project that utilizes the Arduino platform to create a calculator-like device. It can perform basic arithmetic operations such as addition, subtraction, multiplication, and division. The calculator can be built using various components, including buttons, an LCD display, and the Arduino board itself. By programming the Arduino board, I can define and even alter the behavior of the calculator and customize its functionality.

CIRCUIT & BLOCK DIAGRAM – BLUEPRINT/ SCHEMATIC/ LAYOUT

A diagram of a computer

Description automatically generated

ABOUT PROJECT:

The Arduino calculator project aims to create a simple calculator using an Arduino board, a 4x4 keypad, and an LCD display.

MOTIVATION

To demonstrate the capabilities of the Arduino platform and provide hands-on learning experience in embedded programming. How a custom-based approach can address more challenges and problems on a higher scale and meet required market demands.

SOFTWARE APPROACH

The software development for the Arduino calculator involves writing code in the Arduino IDE. The code utilizes libraries such as the Keypad library and the Liquid Crystal library to interface with the keypad and LCD display, respectively. These libraries provide convenient functions and methods to handle input from the keypad and display output on the LCD screen.

HARDWARE COMPONENTS

The hardware components used in this project include an Arduino board (ARDUINO NANO/UNO), (4x4 KEYPAD CALCULATOR, 10K POTENTIOMETER, BREADBOARD, and a (16x2 LCD DISPLAY). The keypad is connected to the Arduino board using digital pins (JUMPER WIRES), (ARDUINO CABLE) while the LCD display is connected using digital and analog pins.

UNDERSTANDING OF PROJECT

The core functionality of the Arduino calculator includes performing basic arithmetic operations such as addition, subtraction, multiplication, and division. The user can input numbers and operators using the keypad, and the result is displayed on the LCD screen. The code handles the input and performs the corresponding calculations based on the operator selected.

To develop the software, the Arduino IDE is used, which provides a user-friendly interface for writing, compiling, and uploading code to the Arduino board. The code is tested and debugged using the serial monitor in the Arduino IDE, which allows for monitoring and debugging the program's behavior.

In terms of testing methodologies, the Arduino calculator project can be tested by inputting various calculations and verifying that the correct results are displayed on the LCD screen. The code can be further optimized and tested for edge cases and error handling to ensure the calculator functions reliably.

Overall, the Arduino calculator project provides a practical application of the Arduino platform and allows users to gain hands-on experience in programming and hardware interfacing. It serves as a starting point for learning more advanced concepts and expanding the functionality of the calculator.

COST EXPENSES PERTAINING MATERIALS

Arduino Nano/Uno Rs: 950

4\*4 Calculator Keypad Rs: 250

10K Potentiometer Rs: 450

Breadboard Rs: 340

LCD Display Rs: 580

Jumper Wire Rs: 230

Arduino UNO Cable Rs: 250

TUTORIAL SITES FOR LOGIC AND LAYOUT

Techtronicharsh.com

https://www.instructables.com/Arduino-Calculator-Using-4X4-Keypad/