

GOVERNMENT COLLEGE OF ENGINEERING
(Affiliated to Anna University, Chennai)
THANJAVUR-613402



BONAFIDE CERTIFICATE

This is a bonafide record of the practical work done by
.....Register Number....., **SIXTH
SEMESTER B.E.(ECE) in the ET3491 - EMBEDDED SYSTEMS AND IOT
DESIGN LABORATORY**, during the academic year **2023 _ 2024 [EVEN]**.

DATE:

Signature of the staff in-charge

Signature of Head of the Department

Internal Examiner

External Examiner

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EXP NO:

**BASIC ARITHMETIC AND LOGICAL OPERATIONS USING
8051 A. 8 BIT ADDITION**

DATE:

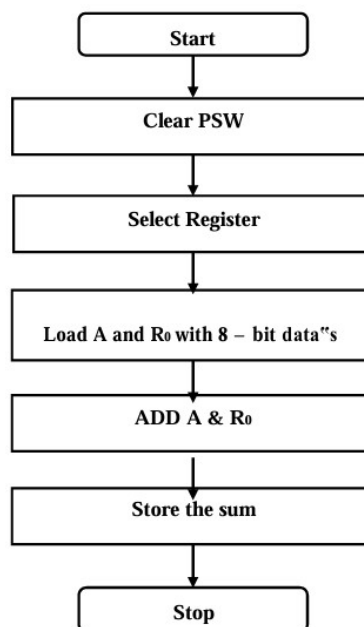
AIM:

To write a program to add two 8-bit numbers using 8051 microcontrollers.

ALGORITHM:

1. Clear Program Status Word.
2. Select Register bank by giving proper values to RS1 & RS0 of PSW.
3. Load accumulator A with any desired 8-bit data.
4. Load the register R 0 with the second 8- bit data.
5. Add these two 8-bit numbers.
6. Store the result.
7. Stop the program.

FLOW CHART:



PROGRAM:**RESULT:**

Thus the 8051 Assembly Language Program for addition of two 8 bit numbers was executed.

EXP NO:

DATE:

BASIC ARITHMETIC AND LOGICAL OPERATIONS USING 8051 B. 8 BIT SUBTRACTION

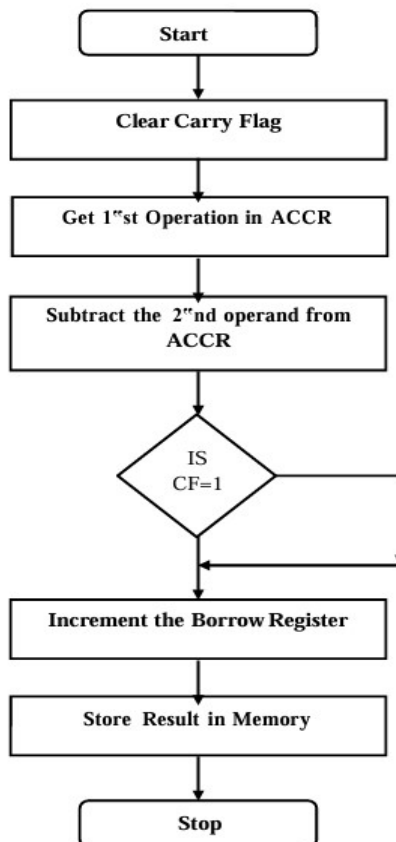
AIM:

To perform subtraction of two 8 bit data and store the result in memory.

ALGORITHM:

1. Clear the carry flag
2. Initialize the register for borrow.
3. Get the first operand into the accumulator.
4. Subtract the second operand from the accumulator.
5. If a borrow results increment the carry register.
6. Store the result in memory.

FLOW CHART:



PROGRAM:**RESULT:**

Thus the 8051 Assembly Language Program for Subtraction of two 8 bit numbers was executed.

EXP NO:

DATE:

**BASIC ARITHMETIC AND LOGICAL OPERATIONS
USING 8051 C. 8 BIT MULTIPLICATION**

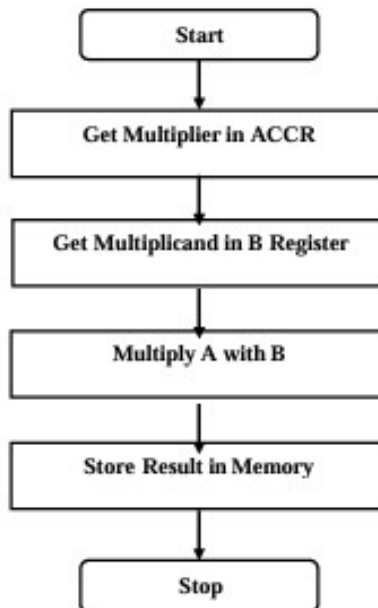
AIM:

To write a program to multiplication two 8-bit numbers using 8051 microcontrollers.

ALGORITHM:

1. Get the multiplier in the accumulator.
2. Get the multiplicand in the B register.
3. Multiply A with B.
4. Store the product in memory.

FLOW CHART:



PROGRAM:**RESULT:**

Thus the 8051 Assembly Language Program for multiplication of two 8 bit numbers was executed.

EXP NO:

DATE:

**BASIC ARITHMETIC AND LOGICAL OPERATIONS
USING 8051 D. 8 BIT DIVISION**

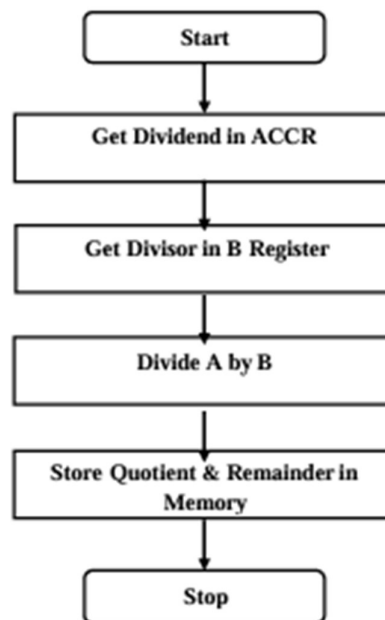
AIM:

To write a program to division two 8-bit numbers using 8051 microcontrollers.

ALGORITHM:

1. Get the Dividend in the accumulator.
2. Get the Divisor in the B register.
3. Divide A by B.
4. Store the Quotient and Remainder in memory

FLOW CHART:



PROGRAM:

RESULT:

Thus the 8051 Assembly Language Program for division of two 8 bit numbers was executed.

EXP NO:	BASIC ARITHMETIC AND LOGICAL OPERATIONS USING 8051 16 BIT ADDITION
DATE:	

AIM:

To write a program to add two 16-bit numbers using 8051 microcontrollers.

ALGORITHM:

1. Clear Program Status Word.
2. Select Register bank by giving proper values to RS1 & RS0 of PSW.
3. Load accumulator A with any desired 16-bit data.
4. Load the register R 0 with the second 16- bit data.
5. Add these two 16-bit numbers.
6. Store the result.
7. Stop the program.

PROGRAM:

RESULT:

Thus the 8051 Assembly Language Program for addition of two 16 bit numbers was executed.

EXP NO:	BASIC ARITHMETIC AND LOGICAL OPERATIONS USING 8051 16 BIT SUBTRACTION
DATE:	

AIM:

To perform subtraction of two 16 bit data and store the result in memory.

ALGORITHM:

1. Clear the carry flag
2. Initialize the register for borrow.
3. Get the first operand into the accumulator.
4. Subtract the second operand from the accumulator.
5. If a borrow results increment the carry register.
6. Store the result in memory.

PROGRAM:

RESULT:

Thus the 8051 Assembly Language Program for Subtraction of two 16 bit numbers was executed.

EXP NO:

GENERATION OF SQUARE WAVEFORM USING 8051

DATE:

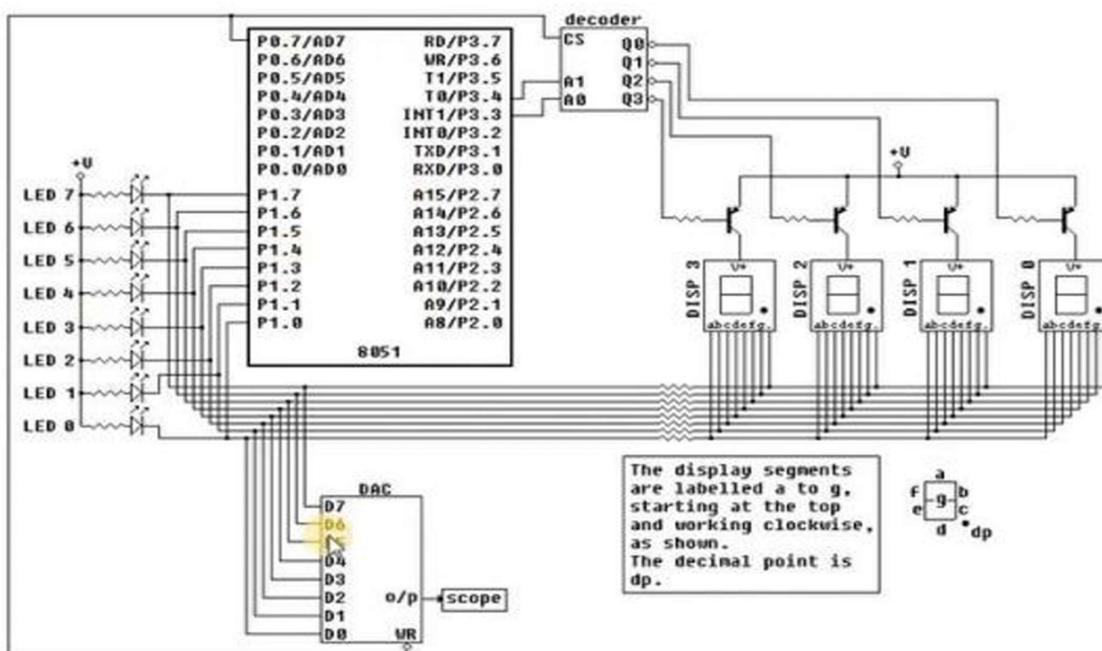
AIM :-

To interface the DAC with the 8051 microcontroller and generate the square waveform

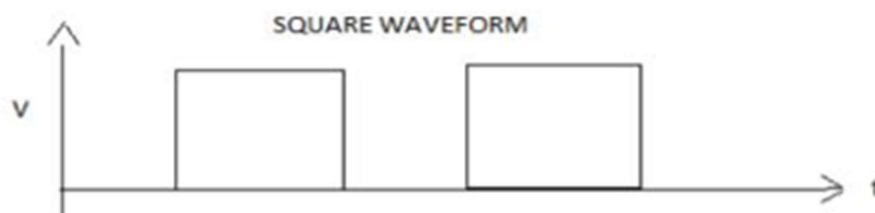
REQUIREMENTS :-

- Edsim51DI simulator/8051 trainer kit/DAC interfacing Board/CRO

CIRCUIT DIAGRAM :-



WAVEFORMS :-



PROGRAM :-

8051 TRAINER KIT PROGRAM :-

RESULT :-

Thus, the assembly language program for performing the interfacing of DAC with 8051 has been verified

EXP NO:

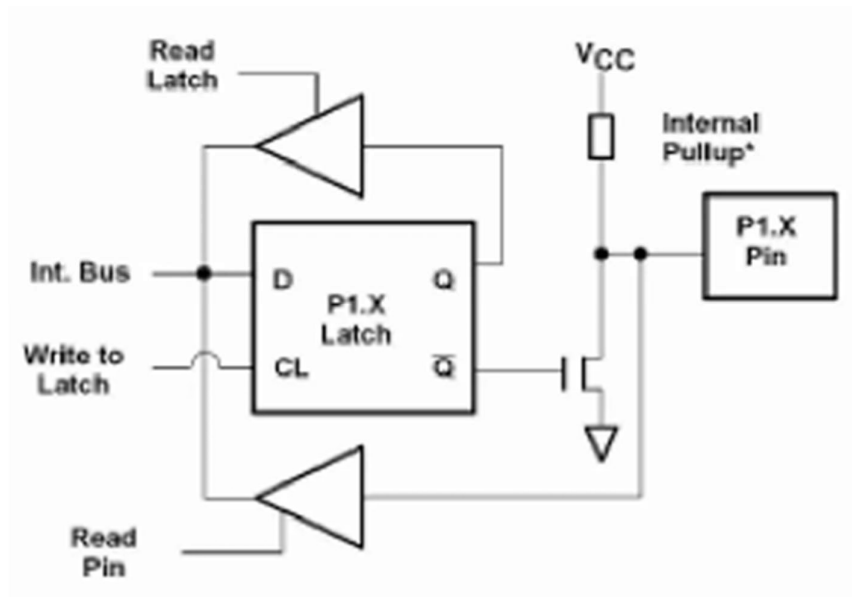
DATE:

Programming using on – Chip ports in 8051.

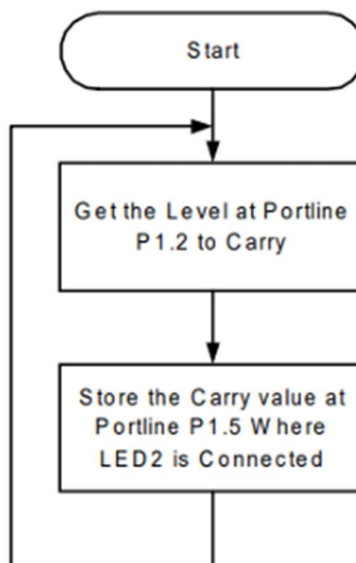
AIM:

To read the status of the switch connected to port line p1.2, p3.2 and display it on led connected to port line p1.5, p1.6

CIRCUIT :-



FLOW CHART :-



PROGRAM :

RESULT :

Thus, the assembly language Programming using on – Chip ports in 8051 has been verified.

EXP NO:

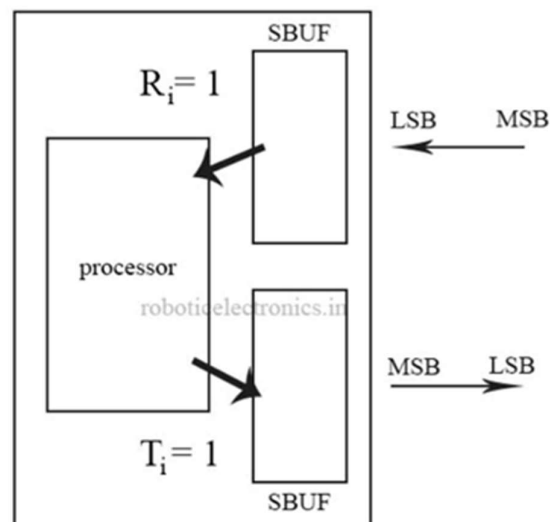
DATE:

Programming using Serial Ports in 8051.

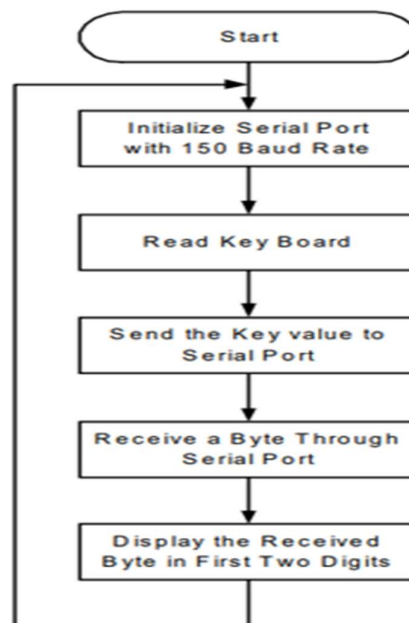
AIM :

To write a program for the 8051 to transfer character serially at 150 baud rate.

BLOCK DIAGRAM :



FLOW CHART :



PROGRAM :

RESULT :

Thus, the assembly language Programming using Serial Ports in 8051 has been verified.

EXP NO:	LED & FLASHIN OF LED'S
DATE:	

AIM :

To write and execute the program for LED & flashing LED 'S with ARM 7 (LPC2148) processor.

HARDWARE & SOFTWARE TOOLS REQUIRED :

S.No	HARDWARE & SOFTWARE REQUIREMENTS	QUANTITY
1	ARM processor board	1
2	USB / FRC Connector	few
3	LED Module	1
4	Power Supply adapter (5V,DC)	1
5	Keil & flash magic Software	1

PROCEDURE :

1. Create a New project, Go to "Project" and close the current project "Close Project".
2. Next Go to the Project New uvision Project Create New Project Select Device for Target.
3. Select the data base NXP LPC2148.
4. Add Startup file and Next go to "File" and click "New".
5. Write a program on the editor window and save as "Main.c".
6. Add this source file to Group and click on "Build Target" or F7.
7. Create a Hex file from "Project" menu and click on "Rebuild all target Files".
8. Open Flash magic and select the device LPC2148 in ARM 7 category, Choose the hardware connected COM port, baud rate 9600, interface None [ISP], Oscillator frequency 12.0 MHz and click on erase of flash code Rd plot.
9. Next browse the path of hex file and select the file.
10. After selecting ISP mode on the Hardware Kit and click on start then device will start to program

PROGRAM :

PROGRAM 2:

RESULT :

Thus, the program for LED & flashing LED has been executed and verified successfully.

EXP NO:	INTERFACING OF LCD
DATE:	

AIM :

To write and execute the program for LCD with ARM7 (lpc2148) processor.

HARDWARE & SOFTWARE TOOLS REQUIRED :

S.No	HARDWARE & SOFTWARE REQUIREMENTS	QUANTITY
1	ARM processor board	1
2	USB / FRC Connector	few
3	LED Module	1
4	Power Supply adapter (5V,DC)	1
5	Keil & flash magic Software	1

PROCEDURE :

1. Create a New project, Go to "Project" and close the current project "Close Project".
2. Next Go to the Project New uvision Project Create New Project Select Device for Target.
3. Select the data base NXP LPC2148.
4. Add Startup file and Next go to "File" and click "New".
5. Write a program on the editor window and save as "Main.c".
6. Add this source file to Group and click on "Build Target" or F7.
7. Create a Hex file from "Project" menu and click on "Rebuild all target Files"
8. Open Flash magic and select the device LPC2148 in ARM 7 category, COM port will be COM 3, baud rate 9600, interface None [ISP], Oscillator frequency 12.0 MHz and click on erase of flash code Rd plot.
9. Next browse the path of hex file and select the file.
10. After selecting ISP mode on the Hardware Kit and click on start then device will start to program

PROGRAM :

RESULT :

Thus, the program for INTERFACING OF LCD has been executed and verified successfully.

EXP NO:

DATE:

INTERFACING OF MATRIX KEYBOARD

AIM :

To write and execute the program for Matrix Keyboard with ARM7 (lpc2148) processor.

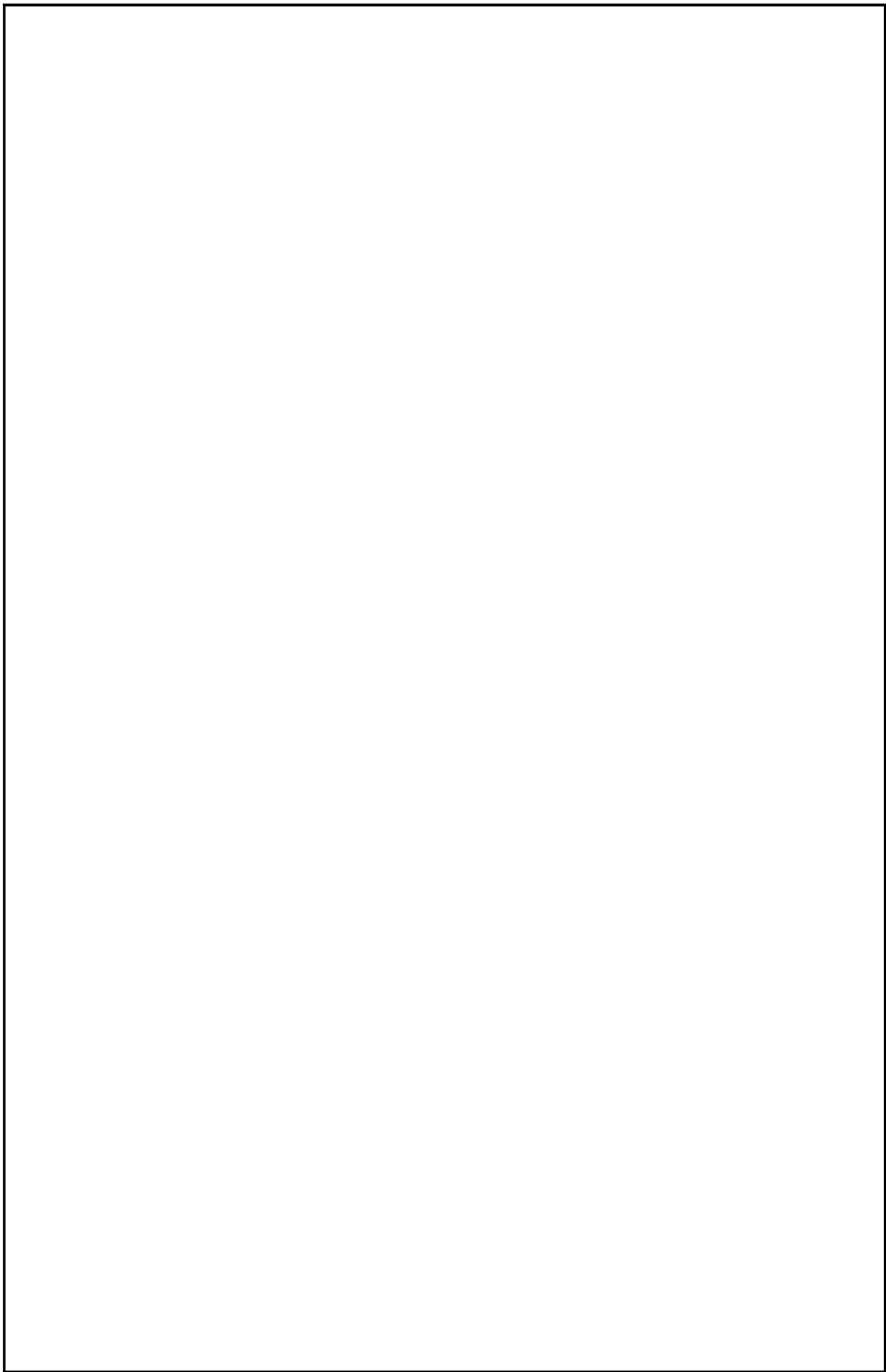
HARDWARE & SOFTWARE TOOLS REQUIRED :

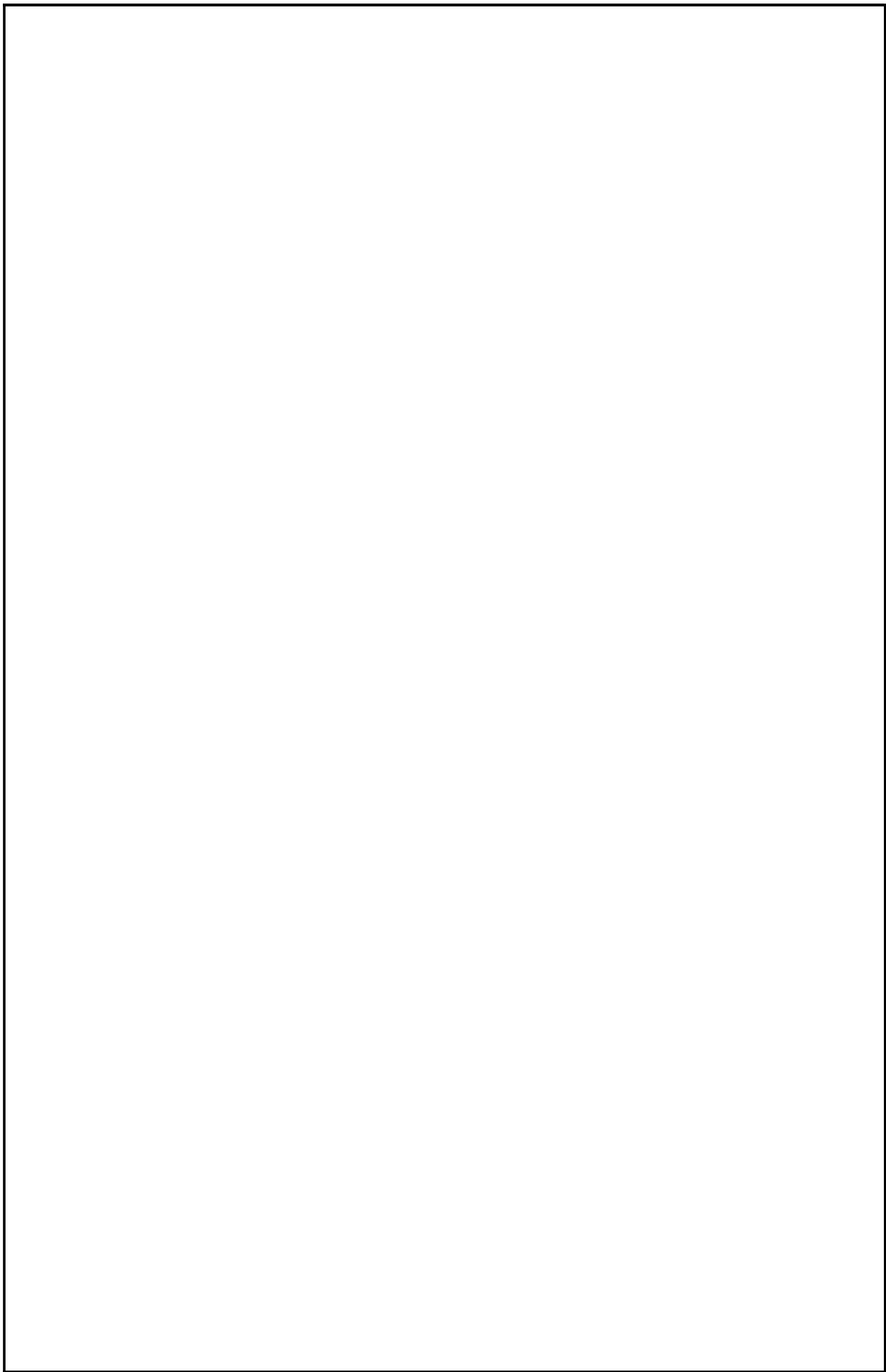
S.No	HARDWARE & SOFTWARE REQUIREMENTS	QUANTITY
1	ARM processor board	1
2	USB / FRC Connector	few
3	LED Module	1
4	Power Supply adapter (5V,DC)	1
5	Keil & flash magic Software	1
6	Matrix Keyboard Module	1

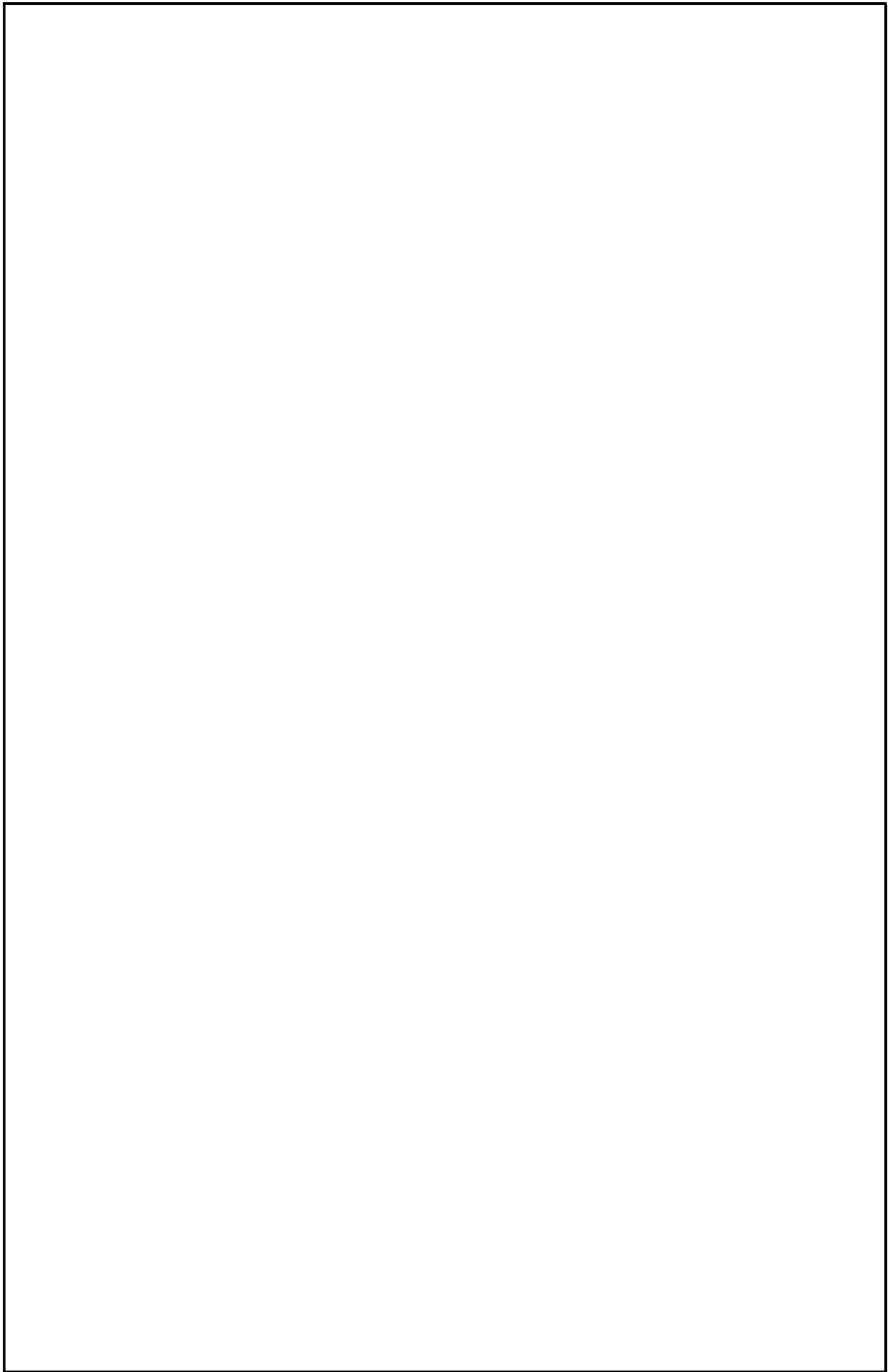
PROCEDURE :

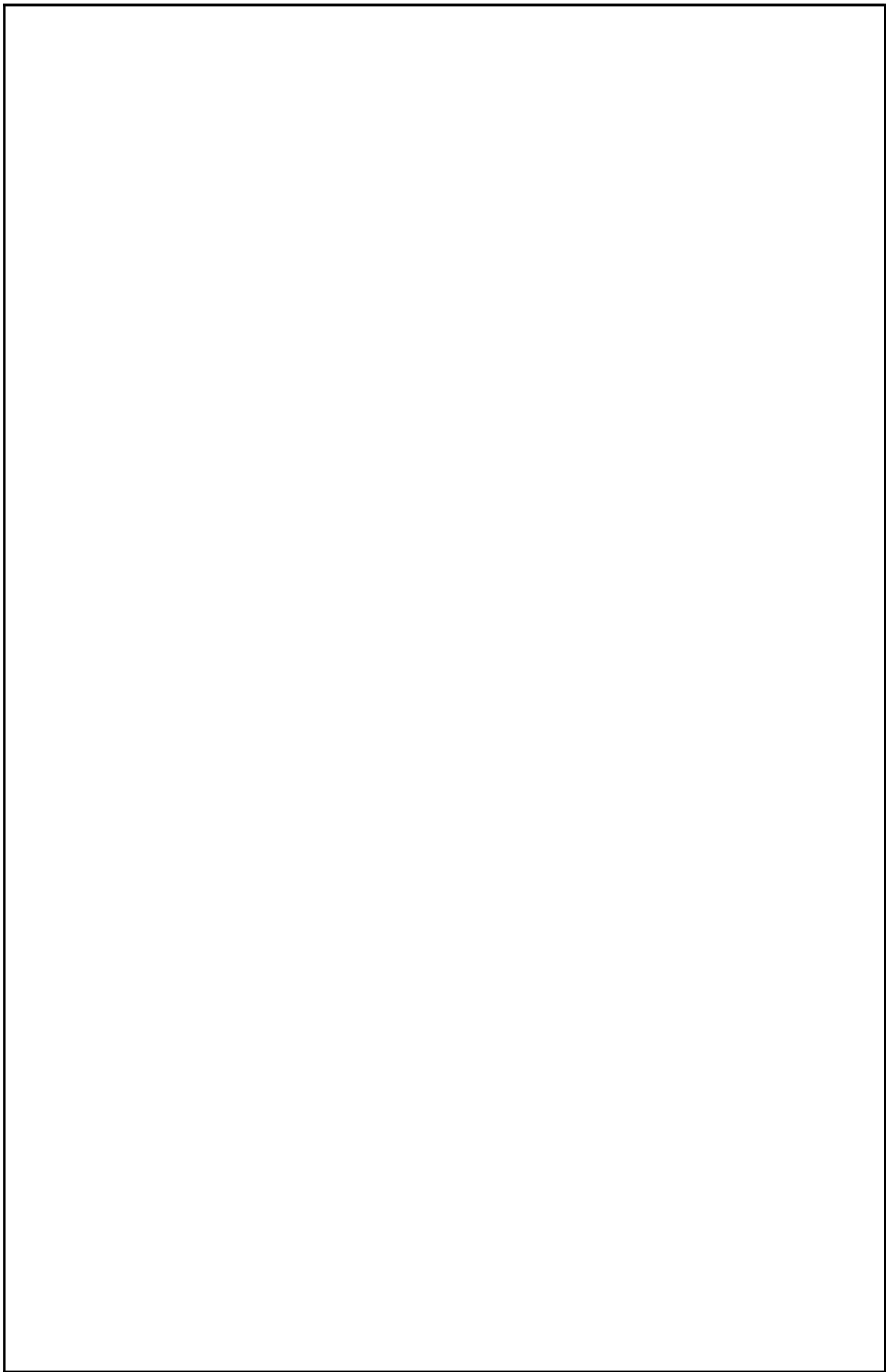
1. Create a New project, Go to "Project" and close the current project "Close Project".
2. Next Go to the Project New uvision Project Create New Project Select Device for Target.
3. Select the data base NXP LPC2148.
4. Add Startup file and Next go to "File" and click "New".
5. Write a program on the editor window and save as "Main.c".
6. Add this source file to Group and click on "Build Target" or F7.
7. Create a Hex file from "Project" menu and click on "Rebuild all target Files".
8. Open Flash magic and select the device LPC2148 in ARM 7 category, COM port will be COM 3, baud rate 9600, interface None [ISP], Oscillator frequency 12.0 MHz and click on erase of flash code Rd plot.
9. Next browse the path of hex file and select the file.
10. After selecting ISP mode on the Hardware Kit and click on start then device will start to program

PROGRAM :









RESULT :

Thus, the program for INTERFACING OF MATRIX KEYBOARD has been executed and verified successfully.

EXP NO:

DATE:

INTERFACING OF STEPPER MOTOR

AIM :

To write and execute the program for Stepper Motor with ARM7 (lpc2148) processor.

HARDWARE & SOFTWARE TOOLS REQUIRED :

S.No	HARDWARE & SOFTWARE REQUIREMENTS	QUANTITY
1	ARM processor board	1
2	USB / FRC Connector	few
3	Stepper Motor Module	1
4	Power Supply adapter (5V,DC)	1
5	Keil & flash magic Software	1

PROCEDURE:

1. Create a New project, Go to "Project" and close the current project "Close Project".
2. Next Go to the Project New uvision Project Create New Project Select Device for Target.
3. Select the data base NXP LPC2148.
4. Add Startup file and Next go to "File" and click "New".
5. Write a program on the editor window and save as "Main.c".
6. Add this source file to Group and click on "Build Target" or F7.
7. Create a Hex file from "Project" menu and click on "Rebuild all target Files".
8. Open Flash magic and select the device LPC2148 in ARM 7 category, COM port will be COM 3, baud rate 9600, interface None [ISP], Oscillator frequency 12.0 MHz and click on erase of flash code Rd plot.
9. Next browse the path of hex file and select the file.
10. After selecting ISP mode on the Hardware Kit and click on start then device will start to Program

PROGRAM:

RESULT :

Thus, the program for Stepper Motor has been executed and verified successfully.

EXP NO:	INTERFACING ADC & DAC
DATE:	

AIM :

To Write and Execute a program for reading an on-chip ADC, convert it into decimal and to display it and to generate a buzzer using DAC interfacing.

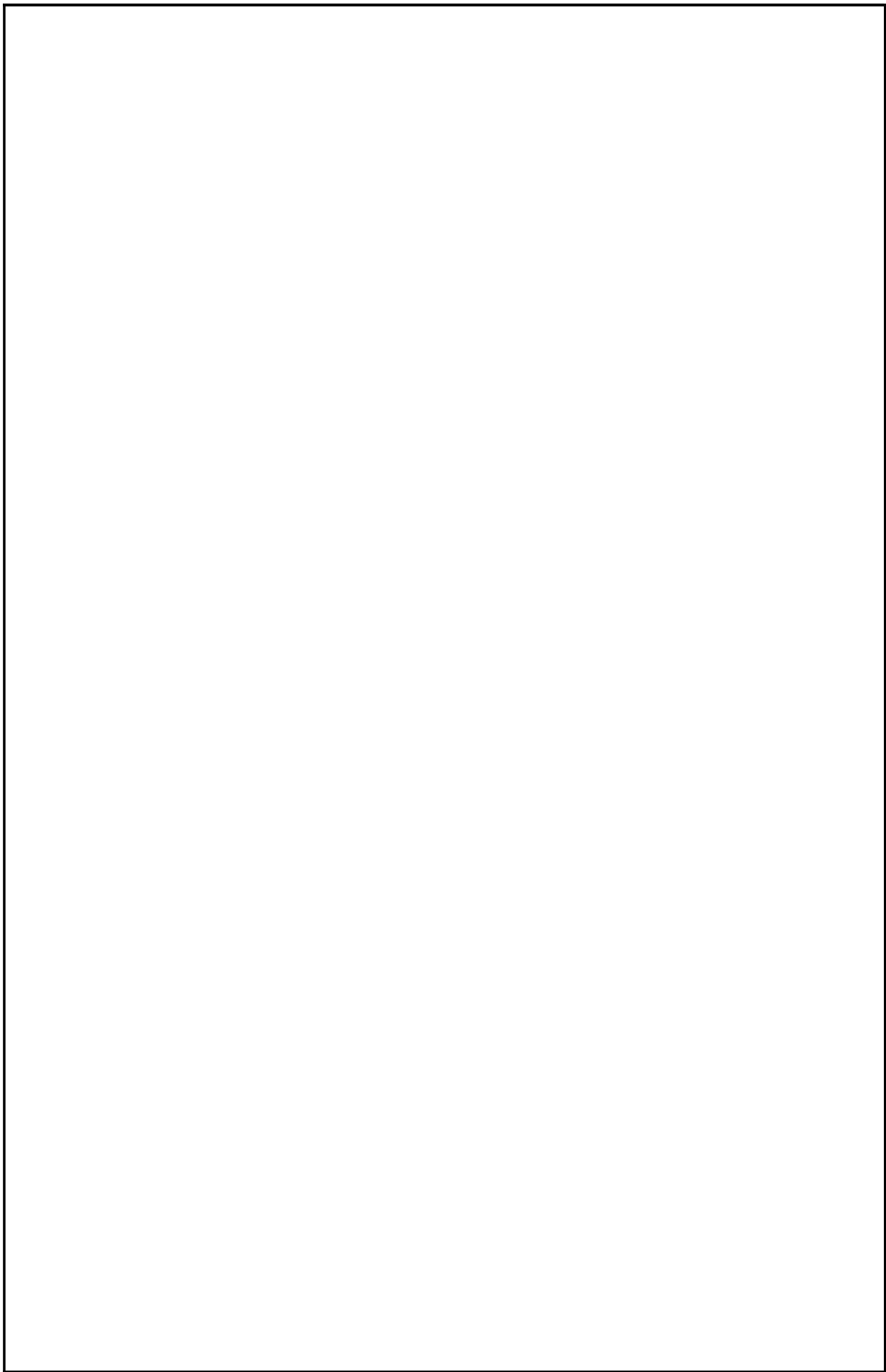
HARDWARE & SOFTWARE TOOLS REQUIRED :

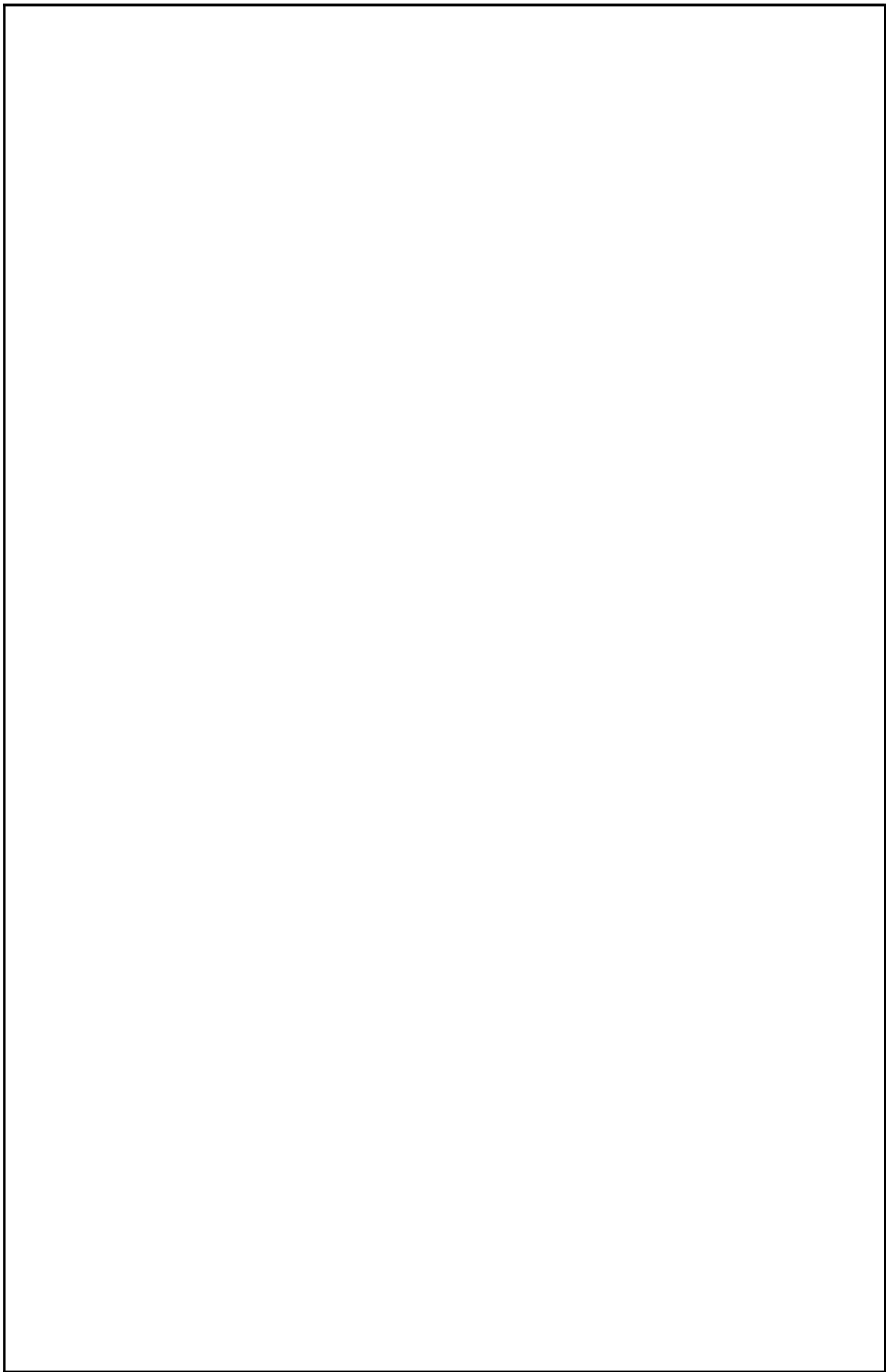
S.No	HARDWARE & SOFTWARE REQUIREMENTS	QUANTITY
1	ARM processor board	1
2	USB / FRC Connector	few
3	Stepper Motor Module	1
4	Power Supply adapter (5V,DC)	1
5	Keil & flash magic Software	1

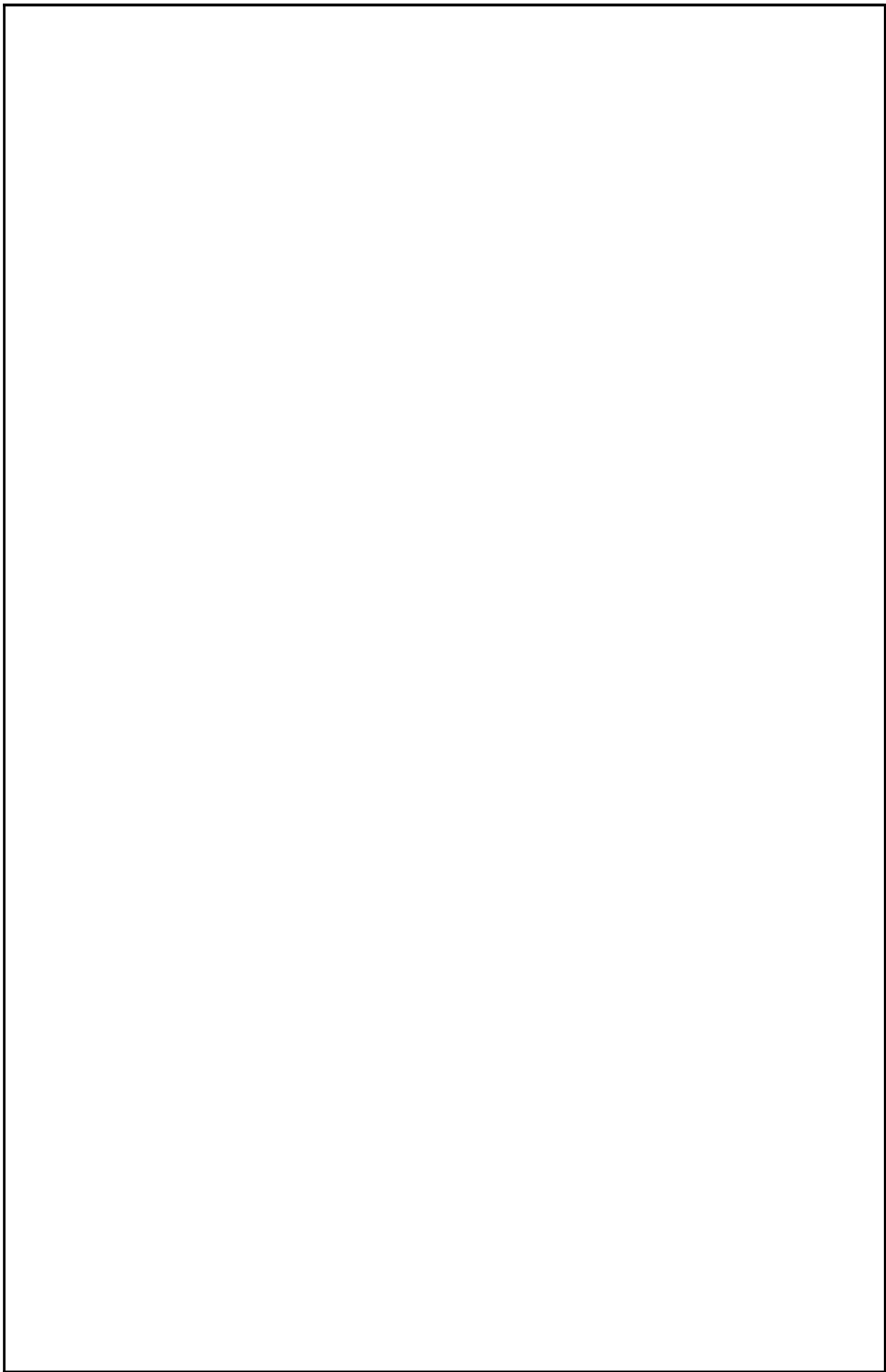
PROCEDURE :

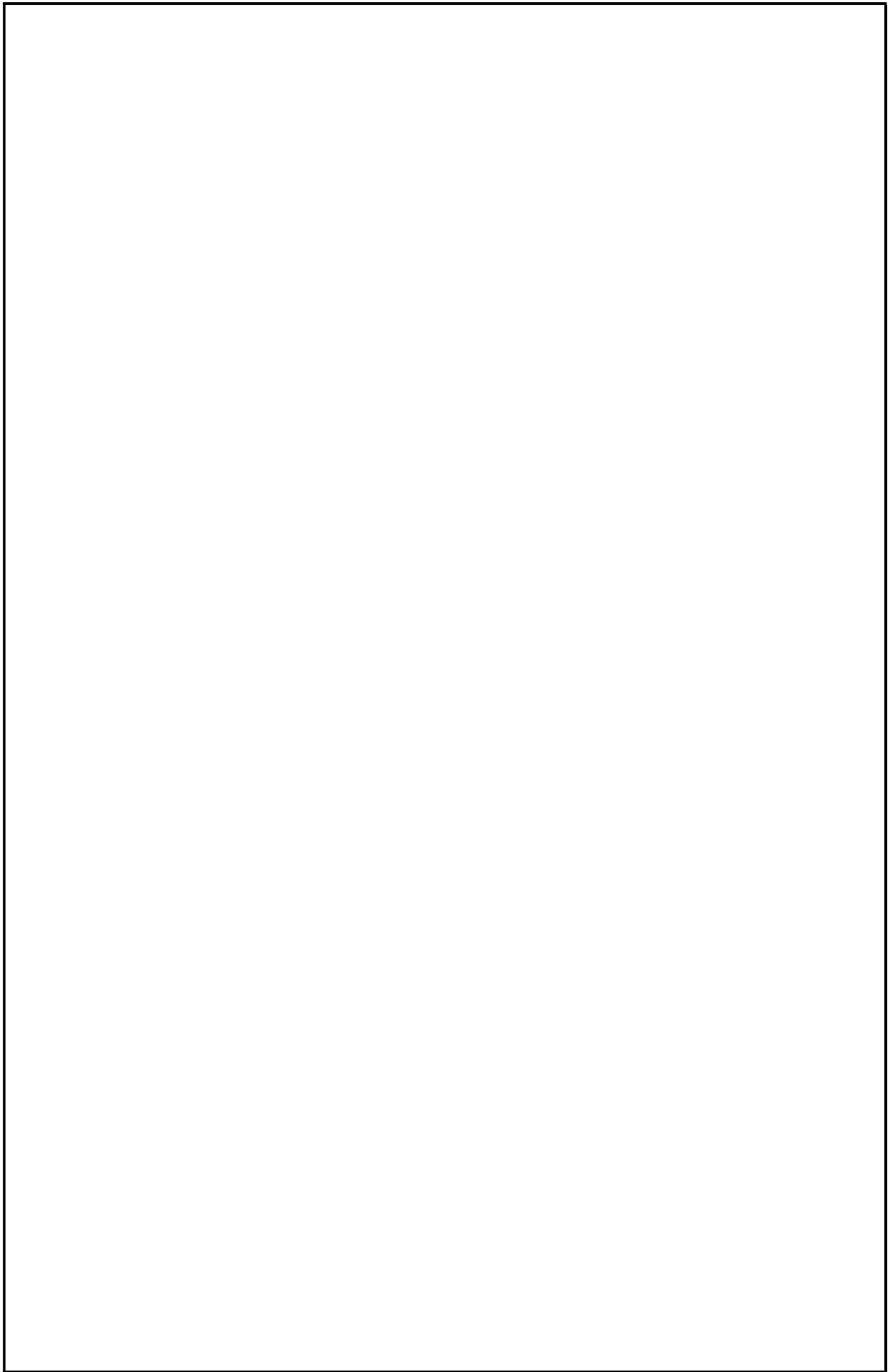
1. Create a New project, Go to "Project" and close the current project "Close Project".
2. Next Go to the Project New uvision Project Create New Project Select Device for Target.
3. Select the data base NXP LPC2148.
4. Add Startup file and Next go to "File" and click "New".
5. Write a program on the editor window and save as "Main.c".
6. Add this source file to Group and click on "Build Target" or F7.
7. Create a Hex file from "Project" menu and click on "Rebuild all target Files".
8. Open Flash magic and select the device LPC2148 in ARM 7 category, COM port will be COM 3, baud rate 9600, interface None [ISP], Oscillator frequency 12.0 MHz and click on erase of flash code Rd plot.
9. Next browse the path of hex file and select the file.
10. After selecting ISP mode on the Hardware Kit and click on start then device will start to program

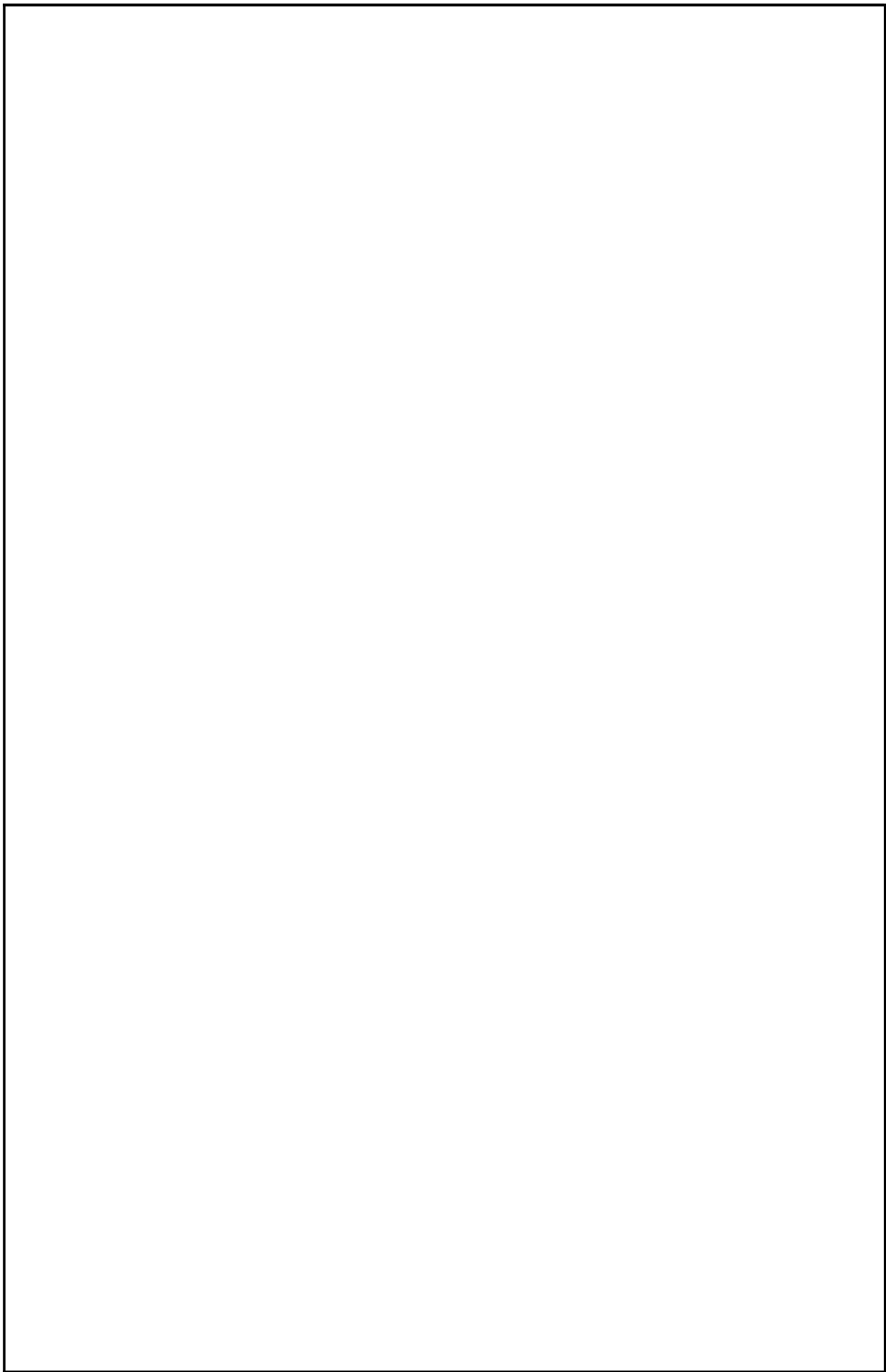
PROGRAM :

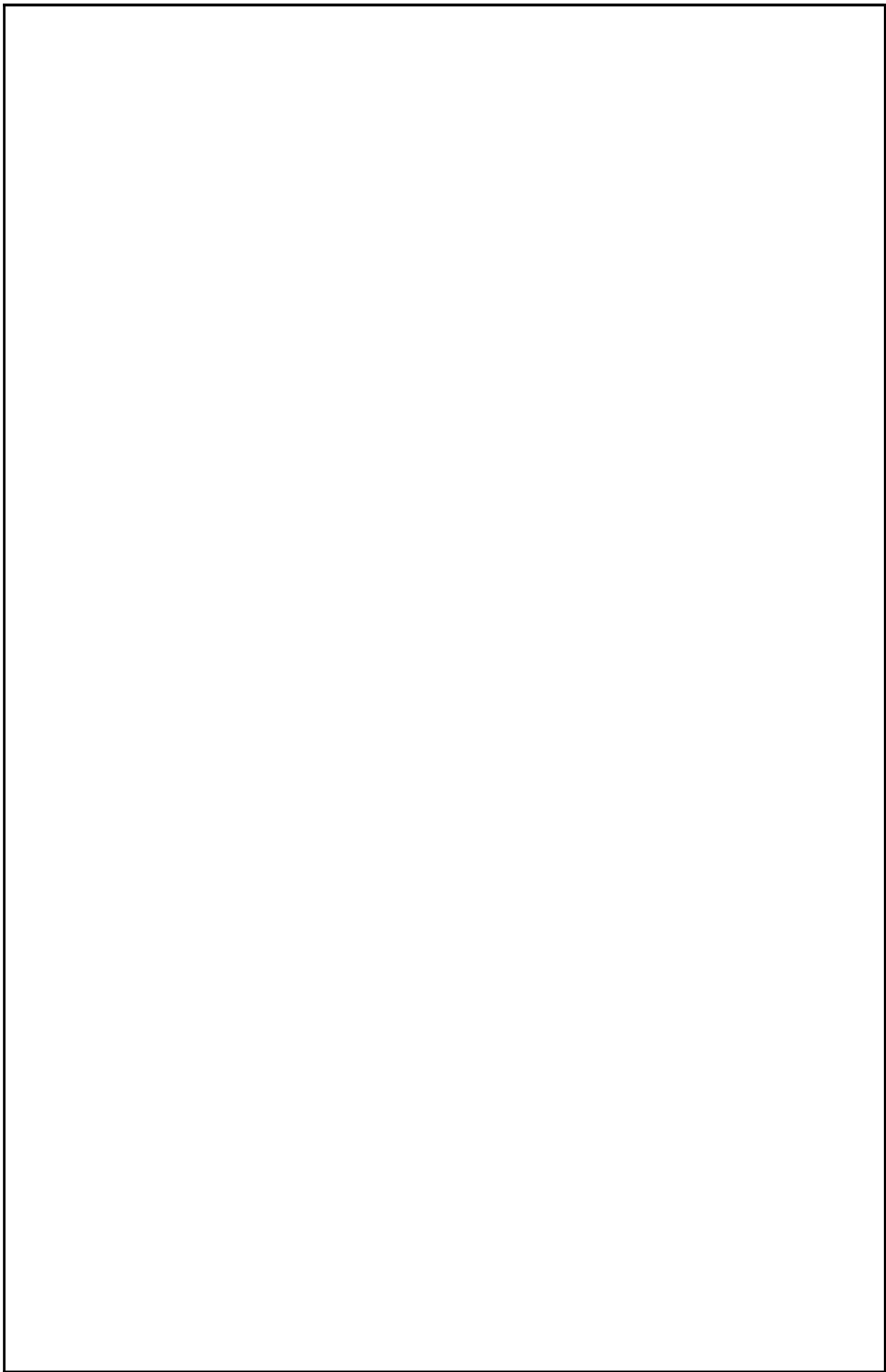


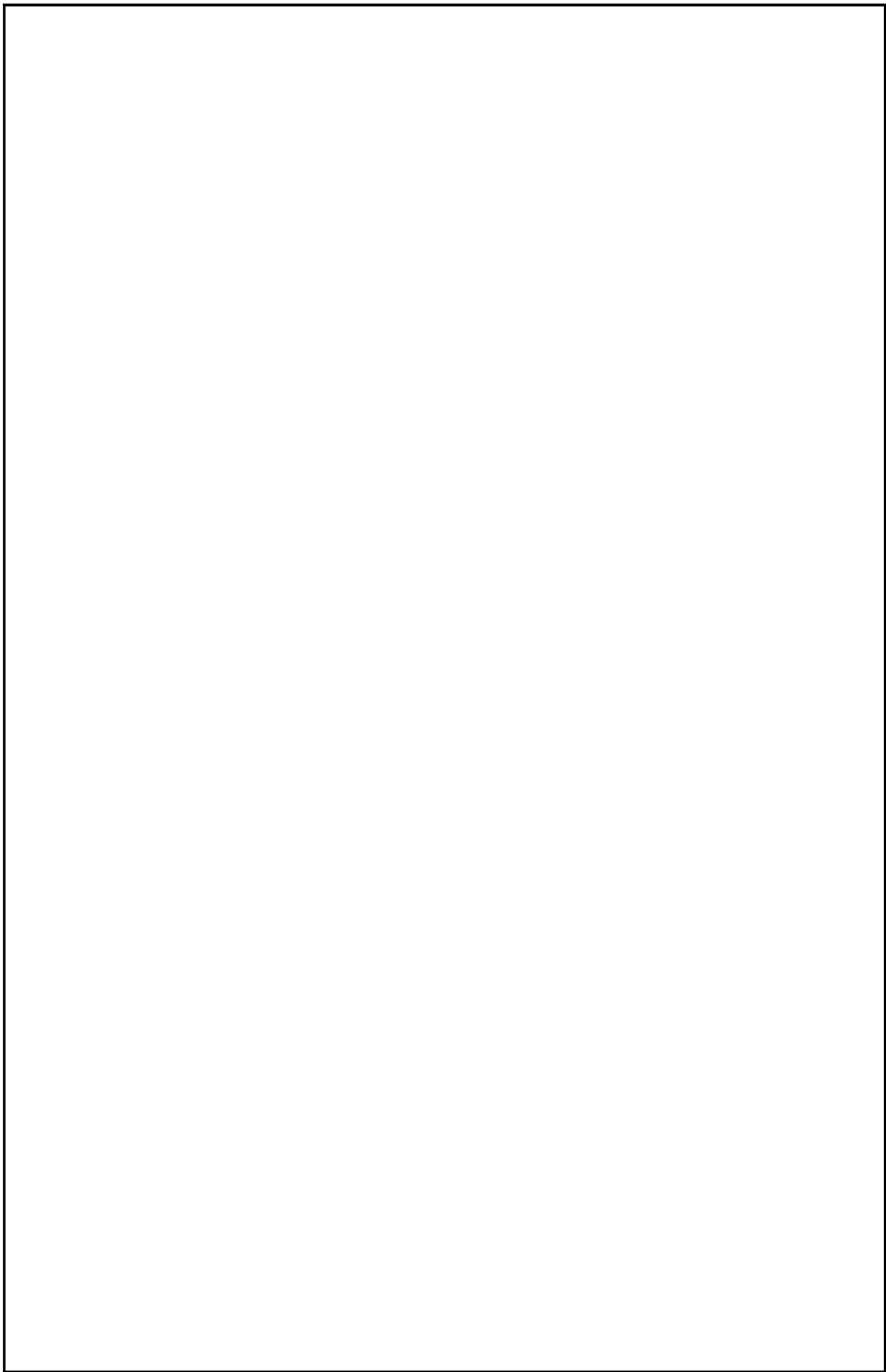


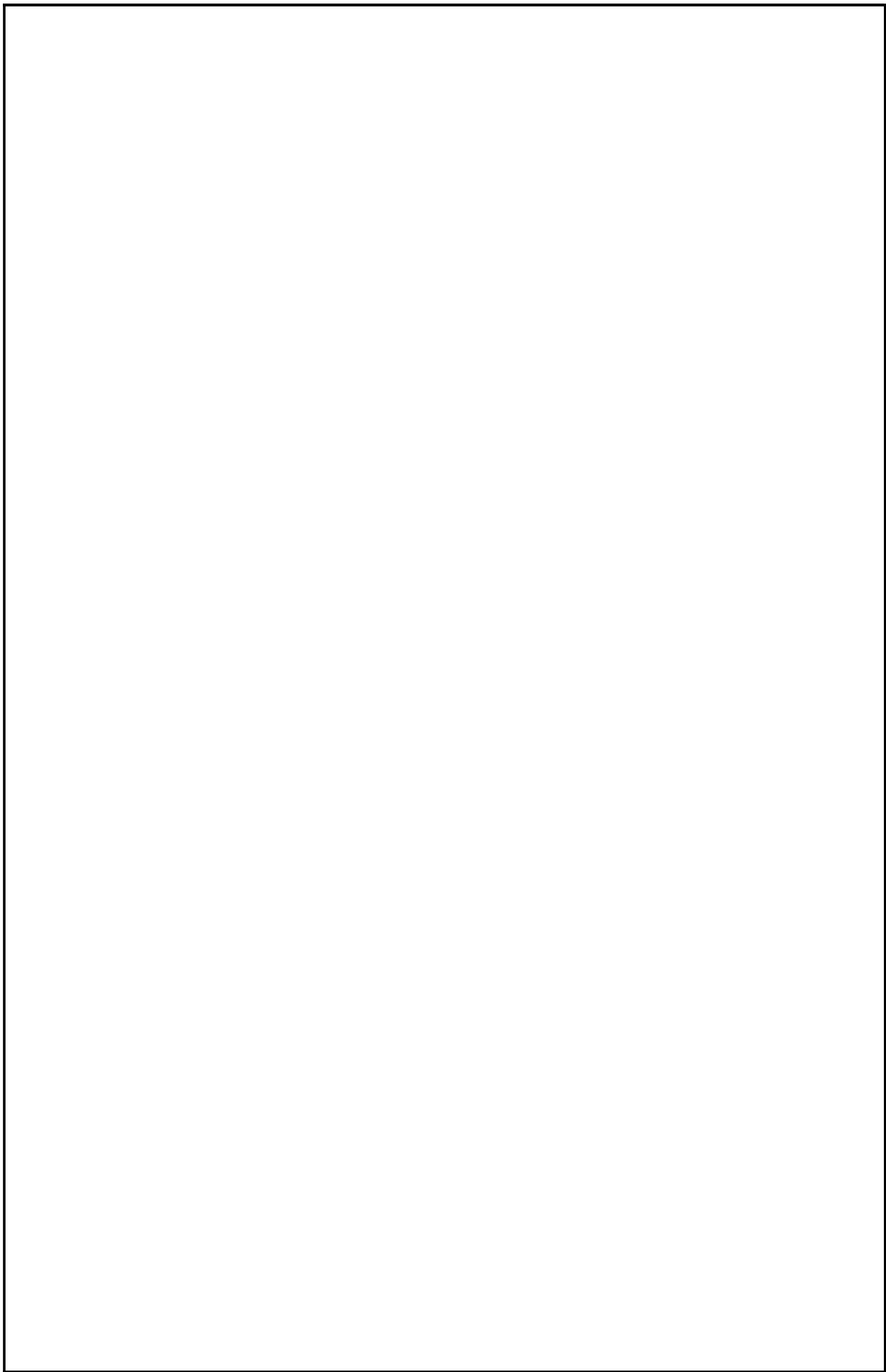


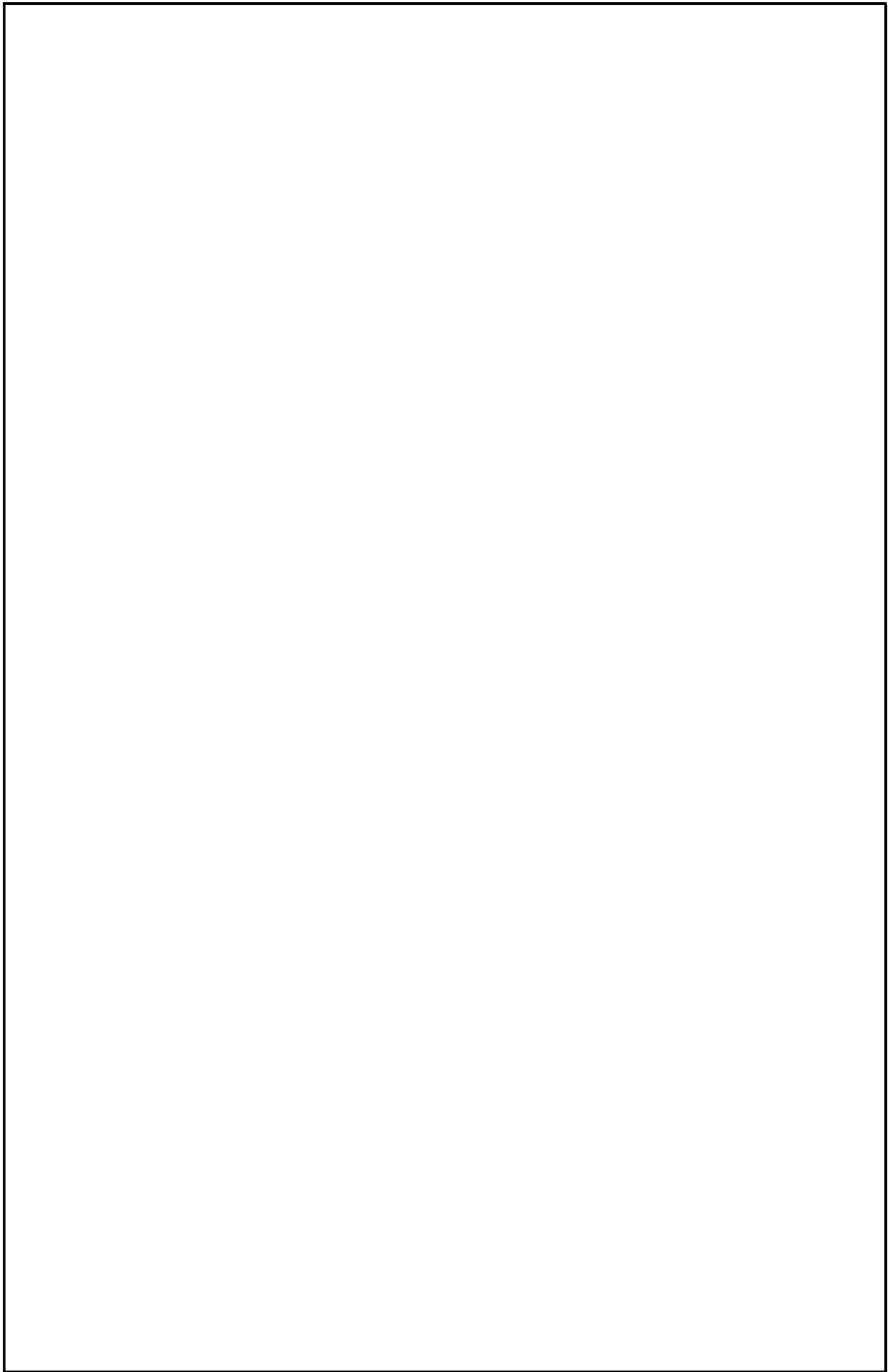












RESULT :

Thus, the program for Interfacing ADC & DAC has been executed and verified successfully.

