



(SMART HOME)

AMIT PROJECT

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NAME	MAHMOUD KHALED AHMED MOHAMED MORSII
GROUP	ALEX_19
E-MAIL	USFKHALED1998@GMAIL.COM
PHONE NUMBER	01280173129

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SMART HOME

I. INTRODUCTION:

SMART HOME IS COLLABORATION OF TECHNOLOGY AND SERVICES THROUGH A NETWORK FOR BETTER QUALITY LIVING. A SMART HOME ALLOWS THE ENTIRE HOME TO BE AUTOMATED AND THEREFORE PROVIDE EASE AND CONVENIENCE TO EVERYDAY ACTIVITIES IN THE HOME. THIS TECHNOLOGY IS USED TO MAKE ALL ELECTRONIC DEVICES TO ACT 'SMART'. IN THE NEAR FUTURE ALMOST ALL THE ELECTRONIC DEVICES WILL TAKE ADVANTAGE OF THIS TECHNOLOGY THROUGH HOME NETWORKS AND THE INTERNET. MANY PEOPLE THINK THIS TECHNOLOGY AS PURE NETWORKING. OTHERS THINK THIS TECHNOLOGY WILL REDUCE THEIR WORK-LOAD, BUT SMART HOME TECHNOLOGY IS COMBINATION OF BOTH AND MUCH MORE. SMART HOME TECHNOLOGY IS CURRENTLY BEING IMPLEMENTED FOR ENTIRE HOUSE IN PARTICULARLY KITCHEN AND LIVING ROOM. BASICALLY, SMART HOME FACILITATES USERS WITH SECURITY, COMFORTABLE LIVING AND ENERGY MANAGEMENT FEATURES AS WELL AS ADDED BENEFITS FOR DISABLED INDIVIDUALS.

FOR EXAMPLE, IN A HOME WITH REMOTELY CONTROLLABLE LIGHTS, CAMERAS AND LOCKS, IT SHOULD BE EASY TO AUTOMATICALLY ALTER LIGHTS BASED ON THE WEATHER AND TIME OF DAY AS WELL AS REMOTELY VIEW WHO IS AT THE DOOR BEFORE UNLOCKING IT. BUT SUCH STRAIGHT FORWARD HOME-WIDE TASKS ARE REMARKABLY UNAVAILABLE FROM THE MAINSTREAM DESPITE THE FACT THAT THE NEEDED HARDWARE DEVICES (SUCH AS WIRELESS LIGHT SWITCHES, DOOR LOCKS, AND CAMERAS) ARE REASONABLY PRICED. MANY ANALYSTS PREDICT THAT THE SMART HOME OF THE FUTURE IS LIKELY TO CONTAIN 15 TO 30 CONNECTED DEVICES AND SENSORS, ALL LINKED VIA A HOME AREA NETWORK AND CONNECTED TO THE INTERNET.

HERE WE WILL MAKE VERY SIMPLE SMART HOME WHICH CAN CONTROL OPENING OR CLOSING OF THE DOOR ALSO IT CAN BE USE IN OPENING OR CLOSING THE LIGHT OF THE HOME REMOTLLY USING BLEUTOOTH MODULE, ALSO WE CONNECT TO CONTROL UNIT AN LCD TO MAKE THE USER UNDERSTAND WHAT HAPPEN.

II. OBJECTIVE:

TWO ECU'S COMMUNICATE WITH EACH OTHER THE FIRST IS A CONTROL ECU WHICH TAKES THE INPUT FROM BLUETOOTH AND SEND IT TO THE SINK (ACTUATOR) ECU VIA SPI TO INTERPRET WHICH ACTION SHOULD BE TAKEN.

IF WE SEND UPPERCASE OR LOWERCASE OF LETTER A THE ACTUATOR_ONE WILL BE ACTIVATED; ALSO THE LCD SCREEN WILL WRITE WHAT HAPPEN AND GIVE OPTION IF THE USER WANT TO IN-ACTIVATE IT.

IF WE SEND UPPERCASE OR LOWERCASE OF LETTER B THE ACTUATOR_ONE WILL BE INACTIVATED; ALSO THE LCD SCREEN WILL WRITE WHAT HAPPEN AND GIVE OPPTION IF THE USER WANT TO ACTIVATE ACTUATOR_ONE OR ACTUATOR_TWO.

IF WE SEND UPPERCASE OR LOWERCASE OF LETTER C THE ACTUATOR_TWO WILL BE ACTIVATED; ALSO THE LCD SCREEN WILL WRITE WHAT HAPPEN AND GIVE OPTION IF THE USER WANT TO IN-ACTIVATE IT.

IF WE SEND UPPERCASE OR LOWERCASE OF LETTER D THE ACTUATOR_TWO WILL BE INACTIVATED; ALSO THE LCD SCREEN WILL WRITE WHAT HAPPEN AND GIVE OPTION IF THE USER WANT TO ACTIVATE ACTUATOR_ONE OR ACTUATOR_TWO.

WE WILL USE AVR (ATMEGA 32A) TO PREFORM THE PREVIOUS CASES.

III. DRIVERS DESCRIPTION:

1. MASTER CU FILE:

- **UART DRIVER:**

INITIALIZE UART FUNCTIONALITY TO CONNECT MCU WITH MOBILE PHONE.

HANDLE RECEIVED/SENT DATA FROM/WITHIN THE MCU USING THE FUNCTIONALITY OF THE UART PROTOTYPES.

INCLUDE FILES ARE: UART.H & UART.C.

- **MYDEFINES DRIVER:**

USED TO DEFINED SOME COSTANT USED IN ALL THE DRIVERS.

INCLUDE FILES ARE: MYDEFINES.H & MYDEFINES.C.

- **IO DRIVER:**

USED TO SET PIN OR PORT CONFIGURATION, ALSO IT INCLUDE SOME PROTOTYPE WHICH CAN USE IN TOGGLING THE PIN, PRESS ON PIN (IF WE WANT TO USE PUSH BUTTOM).

INCLUDE FILES ARE: IODRIVER.H & IODRIVER.C.

- **LCD_8BIT DRIVER:**

INITIALIZE 8_BIT LCD FUNCTIONALITY TO CONNECT IT WITH MATER_CU TO GIVE INDUCATION ABOUT WHAT HAPPENED AND GIVE SOME OPOSITIONS TO THE USER. IT INCLUDE SOME PROTOTYPES LIKE INITIATION, SEND CHAR, SEND COMMAND, SEND INTEGER, AND SEND STRING OF CHAR.

INCLUDE FILES ARE: LCD_8BIT.H & LCD_8BIT.C.

- **SPI DRIVER:**

INITIALIZE SPI FUNCTIONALITY TO MAKE MCUS COMMUNICATE WITH EACH OTHER.

IT INCLUDE THE GENERAL SPI PROTOTYPES WHICH CAN WORK IN ANY MOOD MASTER OR SLAVE BUT IN MASTER_CU WE USED MASTER MOOD SPI ONLY HANDLE RECEIVED/SENT DATA FROM/WITHIN THE MCU USING INTERRUPT METHOD.

INCLUDE FILES ARE: SPI.H & SPI.C.

- **MAIN.C**

CONTAIN THE CODE WHICH HANDLE THE PREFORMANCE OF MASTER CU TO WORK AS WE WANT.

2. EX S PRO FILE (SLAVE CU):

- **MYDEFINES DRIVER:**

USED TO DEFINED SOME COSTANT USED IN ALL THE DRIVERS.

INCLUDE FILES ARE: MYDEFINES.H & MYDEFINES.C.

- **IO DRIVER:**

USED TO SET PIN OR PORT CONFIGURATION, ALSO IT INCLUDE SOME PROTOTYPE WHICH CAN USE IN TOGGLING THE PIN, PRESS ON PIN (IF WE WANT TO USE PUSH BUTTOM).

INCLUDE FILES ARE: IODRIVER.H & IODRIVER.C.

- **MAIN.C:**

CONTAIN THE CODE WHICH HANDLE THE PREFORMANCE OF SLAVE CU TO WORK AS WE WANT, ALSO IT CONTAIN THE PROTOTYPE OF SLAVE SPI.

IV. CONCLUSION:

WE RUN THE CODE IN GENERAL FORM SO WE CAN SEND ANY DATA TO PERFORM THE FUNCTION WE WANT TO DO LIKE OPEN THE LIGHT OR CLOSE IT, ALSO WE CAN USE IT WITH DOOR TO OPEN IT OR CLOSE AND THERE IS AN LCD TO GIVE INDICATION ABOUT WHAT HAPPEN IN ADDITION IT GIVE SOME OPTIONS THE USER CAN DO.

ALSO THE SIMULATION ON PROTEUS IS RUN SAFELY WITHOUT ANY ERRORS OR WARNING.

VI. CODE LINK:

[HTTPS://GITHUB.COM/USFKHALED98/SMART HOME AMIT
FINAL PROJECT1.GIT](https://github.com/USFKHALED98/SMART_HOME_AMIT_FINAL_PROJECT1.GIT)