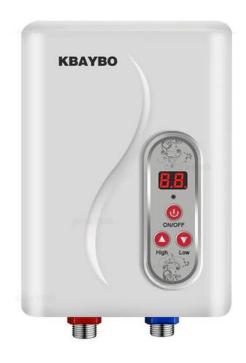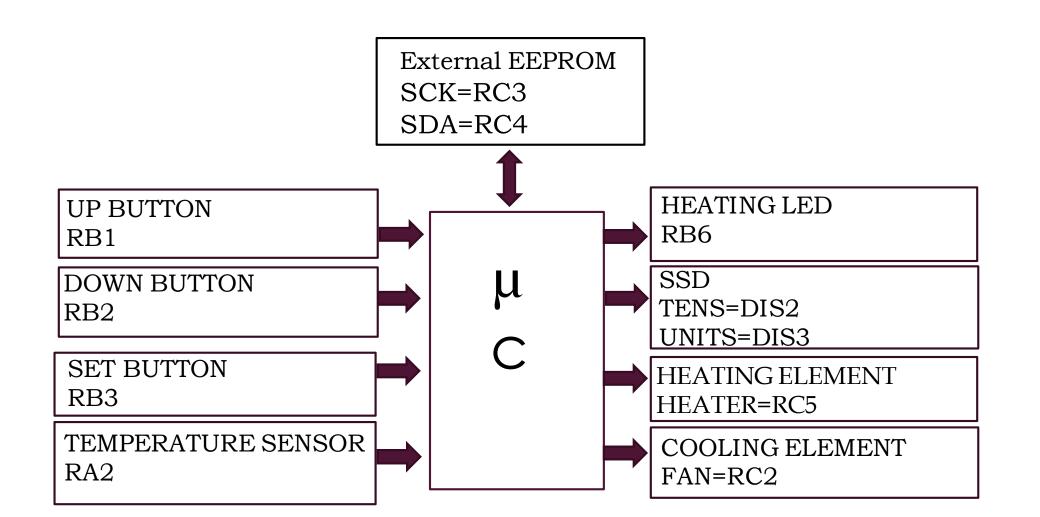# ELECTRIC WATER HEATER

BY: RINAD GAMAL EL-DIN ASHOUR
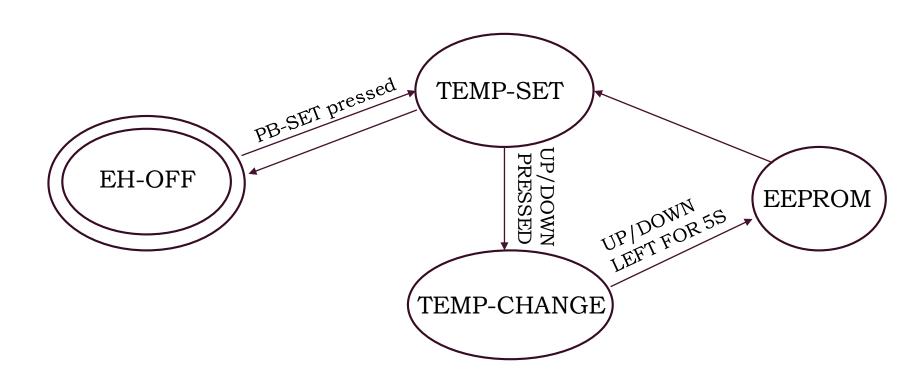
Swift Act training
 final project
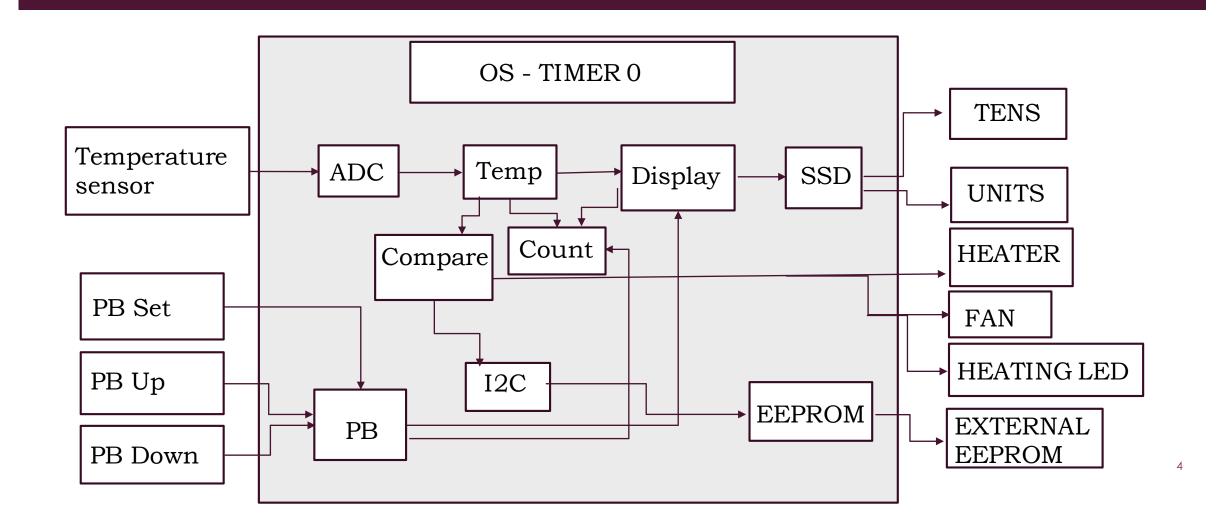
OVERVIEW AND CONNECTIONS

External EEPROM
SCK=RC3
SDA=RC4

UP BUTTON
RB1

DOWN BUTTON
RB2

SET BUTTON
RB3

TEMPERATURE SENSOR
RA2

μ
C

HEATING LED
RB6

SSD
TENS=DIS2
UNITS=DIS3

HEATING ELEMENT
HEATER=RC5

COOLING ELEMENT
FAN=RC2

STATE MACHINE

DETAILED DESIGN

- PB
  1. PB_Init
  2. PB_Update
  3. PB_GetState
- SSD
  1. SSD_Init
  2. SSD_Update
  3. SSD_SetSymbol
  4. SSD_SetState
  5. SSD_GetSymbol
  6. SSD_GetState

- Count
  1. count_Init
  2. count_Update
  3. count_GetCount
- Compare
  1. compare_Init
  2. compare_Update
- Temp
  1. temp_Init
  2. temp_Update
  3. temp_GetResults

- Timer
  1. TMR_Init
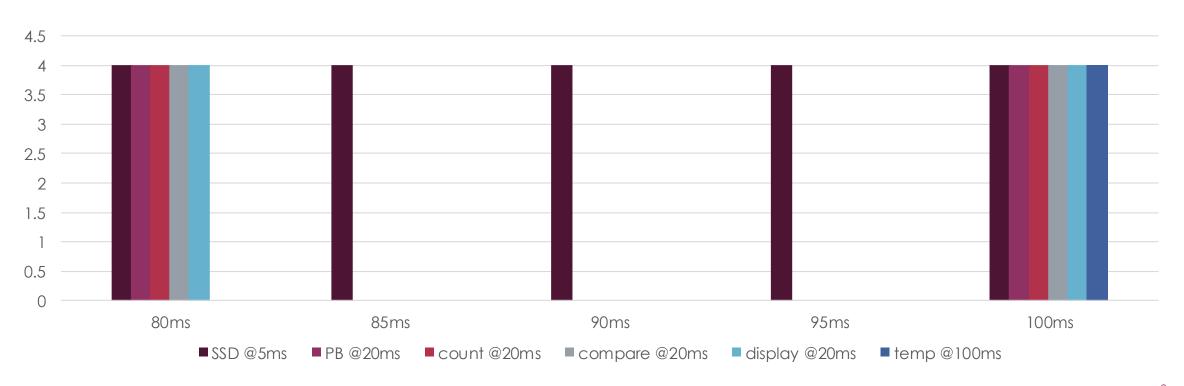 2. TMR_Start
  3. TMR_CheckOverFlow
  4. TMR_Stop
  5. TMR_Update
- ADC
  1. ADC_Init
  2. ADC_Update
  3. ADC_GetResult
- Display
  1. display_Init
  2. display_Update
  3. display_ONOFF
  4. display_SetState
  5. display_GetState
  6. display_GetPOWERState
- I2C
  1. i2c_init
  2. i2c_start
  3. i2c_stop
  4. i2c_wb
  5. i2c_rb
- EEPROM
  1. e2pext_r
  2. e2pext_w

TIMING ANALYSIS

Task	BCET (ms)	WCET (ms)	Period of Task (ms)
PB	$\cong 0$	$\cong 0$	20
Compare	$\cong 0$	$\cong 0$	20
Count	$\cong 0$	$\cong 0$	20
Display	$\cong 0$	$\cong 0$	20
SSD	$\cong 0$	$\cong 0$	5
Temp	$\cong 0$	$\cong 0$	100
		TICK (ms)	5
		Major Cycle (ms)	100

SCHEDULABILITY CHECK

Legend: ■ SSD @5ms ■ PB @20ms ■ count @20ms ■ compare @20ms ■ display @20ms ■ temp @100ms

THANK YOU