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/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Project: Static Design \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

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**System modules:**

* Two DC motors.
* Four pushbuttons.
* Microcontroller.

**Interfacing between modules:**

* Four pushbuttons are controlled by DIO peripheral.
* Four pushbuttons control the two dc motors (M1, M2) by DIO, TIMER and PWM peripherals.
* One of push buttons (P1) control the direction of motors (M1, M2) is forward or reversed and their speed by DIO and PWM peripheral.
* Another one (P2) controls the motors (M1, M2) movement to forward or reversed by DIO.
* The last two pushbuttons (P3, P4) control the direction of dc motors (M1, M2) right or left by DIO peripheral.

**Static design:**

* P1 is forward and 0% speed by default.
* If P1 pressed once, when user presses P2 the motors move forward with 30% of their max speed as long as user presses the button.
* If P1 is pressed again, when user presses P2 the motors move forward with 60% of their max speed as long as user presses the button.
* If P1 is pressed again, when user presses P2 the motors move forward with 90% of their max speed as long as user presses the button.
* If P1 is pressed again, the motors direction will be reversed and with 30% speed.
* If P1 presses again, the system will return to default case and the loop will be repeated.
* When P3 is pressed the motors will turn right as long as user presses the button.
* When P4 is pressed the motors will turn left as long as user presses the button.
* DIO, PWM and TIMER functions:

void DIO\_init(ST\_DIO\_config\_t\* configurations);

void DIO\_write(uint8\_t port,EN\_pins pin, uint8\_t data);

void DIO\_read(uint8\_t port,EN\_pins pin, uint8\_t \*data);

void DIO\_toggle(uint8\_t port,EN\_pins pin);

void PWM\_init(ST\_PWM\_config\_t\* configurations);

void PWM\_start(EN\_frequency\_t frequency, EN\_duty\_t dutyCycle);

void PWM\_stop(void);

void TIMER\_init(ST\_TIMER\_config\_t\* configurations);

void TIMER\_start(uint64\_t ticks);

void TIMER\_read(uint8\_t \*value);

void TIMER\_set(uint8\_t value);

void TIMER\_checkStatus(uint8\_t \*status);

**Layered Architecture:**

* MCAL**:** DIO, TIMER and PWM Peripherals.
* EUCAL:Pushbuttons (1 to 4) and Two DC Motors.

