Good Vs Bad Coding Styles

EE337

Microcontroller Pt51

Presented by : Zeal Sheth

Assembly Language Code: Bad Coding Style

- Main program is Wall of Code
- Non Modular Code
- Poor Indentation
- Repetition of bunch of code lines
- Overwriting of register values
- No Comments

Assembly Language Code: Bad Coding Style

```
;-----------------------------------------
;TITLE: BAD CODING STYLES TO
 BLINK LEDs
;AUTHOR : ZEAL SHETH (WEL)
;-----------------------------------------
LED EQU P0

ORG 00H
LJMP MAIN
;---------------------

ORG 100H
MAIN:

MOV LED,#00H
BACK:MOV A,#55H
MOV LED,A
;-----------------------------------------
 MOV R1, #0FFH
 MOV R2, #0FFH
DELAY1:
NOP
DJNZ R1, DELAY1
DJNZ R2, DELAY1

MOV A,#0AAH
MOV LED,A

MOV R1, #0FFH
MOV R2, #0FFH
DELAY1:
NOP
DJNZ R1, DELAY1
DJNZ R2, DELAY1

SJMP BACK

FIN:        SJMP        FIN ;ALL DONE.
;-----------------------------------------
```

Main Program is hugh wall of code . Non modular. Difficult to debug

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MOV A,#0AAH
MOV LED,A

MOV R1, #0FFH
MOV R2, #0FFH
DELAY1:
NOP
DJNZ R1, DELAY1
DJNZ R2, DELAY1

SJMP BACK

FIN:        SJMP        FIN ;ALL DONE.
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```

No Indentation :Each new label corresponds to loop

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MOV LED,A
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```

Repetition of bunch of code lines: Can be converted to subroutine

```
 MOV R1, #0FFH
 MOV R2, #0FFH
DELAY1:
NOP
DJNZ R1, DELAY1
DJNZ R2, DELAY1

MOV A,#0AAH
MOV LED,A

MOV R1, #0FFH
MOV R2, #0FFH
DELAY1:
NOP
DJNZ R1, DELAY1
DJNZ R2, DELAY1

SJMP BACK

FIN:        SJMP        FIN ;ALL DONE.
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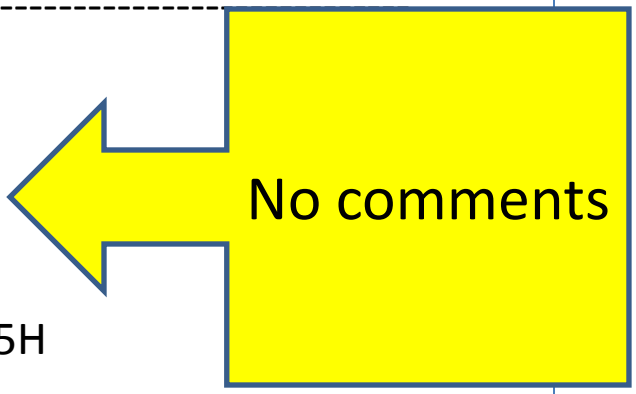


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 MOV R1, #0FFH
 MOV R2, #0FFH
DELAY1:
NOP
DJNZ R1, DELAY1
DJNZ R2, DELAY1

MOV A,#0AAH
MOV LED,A

MOV R1, #0FFH
MOV R2, #0FFH
DELAY1:
NOP
DJNZ R1, DELAY1
DJNZ R2, DELAY1

SJMP BACK

FIN:        SJMP        FIN ;ALL DONE.
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```

Assembly Language Code: Good Coding Style

- Main program is set of function (subroutine) calls
- Modular Code : Easy Debugging
- Subroutine : For Repeated bunch of code lines
- Proper Indentation
- Stack to prevent overwriting of register values
- Appropriate Comments

Assembly Language Code:Good Coding Style

```
;---------------------------------------------------
;TITLE: GOOD CODING STYLES TO BLINK LED
;AUTHOR : ZEAL SHETH (WEL)
;---------------------------------------------------

LED EQU P0
ORG 00H
LJMP MAIN
;---------------------------------------------------
ORG 50H
DELAY:
      PUSH PSW
      PUSH AR1; STORE R1 (BANK 0
                ; ON THE STACK
      PUSH AR2

      MOV R1, #0FFH
      MOV R2, #0FFH
DELAY1:
      NOP
      DJNZ R1, DELAY1
      DJNZ R2, DELAY1

      POP AR2 ; POP MUST BE IN
              ;REVERSE ORDER OF PUSH
      POP AR1
      POP PSW
      RET
;---------------------------------------------------
ORG 100H
MAIN:
        MOV LED,#00H   ;MAKE P0 AS
                       ;OUTPUT PORT
        MOV A,#55H
        BACK:
            MOV LED,A
            LCALL DELAY
            CPL A
             SJMP BACK

FIN:   SJMP FIN          ;ALL DONE.
;---------------------------------------------------
```

Modular Code : Easy Debug

Assembly Language Code:Good Coding Style

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ORG 00H
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ORG 50H
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      PUSH AR2

      MOV R1, #0FFH
      MOV R2, #0FFH
DELAY1:
      NOP
      DJNZ R1, DELAY1
      DJNZ R2, DELAY1

      POP AR2 ; POP MUST BE IN
            ;REVERSE ORDER OF PUSH
      POP AR1
      POP PSW
      RET
;---------------------------------------------------
ORG 100H
MAIN:
        MOV LED,#00H   ;MAKE P0 AS
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        MOV A,#55H
        BACK:
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Subroutine DELAY for reusability

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      POP AR1
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      RET
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Proper Indentation

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      MOV R2, #0FFH
DELAY1:
      NOP
      DJNZ R1, DELAY1
      DJNZ R2, DELAY1

      POP AR2 ; POP MUST BE IN
              ;REVERSE ORDER OF PUSH
      POP AR1
      POP PSW
      RET
;---------------------------------------------------
ORG 100H
MAIN:
        MOV LED,#00H   ;MAKE P0 AS
                       ;OUTPUT PORT
        MOV A,#55H
        BACK:
            MOV LED,A
            LCALL DELAY
            CPL A
             SJMP BACK

FIN:  SJMP FIN          ;ALL DONE.
;---------------------------------------------------
```

Push and Pop to store register values so that they are not overwritten

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      DJNZ R2, DELAY1

      POP AR2 ; POP MUST BE IN
              ;REVERSE ORDER OF PUSH
      POP AR1
      POP PSW
      RET
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Appropriate comments

Thank You