**Experiment 6**

**LOGICAL & BRANCH INSTRUCTIONS**

**Introduction:**

In 8051 Microcontroller there is 17 different instructions under the Logical Group. In total there are 46 opcodes. These instructions do not affect the flag bits but the CJNE affects the CY flag. In these instructions, the 11-bit address and 16-bit addresses are used.A branch is an instruction in a computer program that can cause a computer to begin executing a different instruction sequence and thus deviate from its default behaviour of executing instructions in order. The target address is the absolute address given as an operand to the instruction.

**Objective:**

● To understand BCD addition of packed BCD numbers.

● To understand usage of masking using logical instructions.

● To understand usage of CJNE comparison branch instruction.

**Post Lab code:**

org 0X0

MOV r0,#23h

mov r1,#35h

mov a,r0

add a,r1

mov r2,a

jb ac,cs1

jnb ac,cs2

jmp en

cs1:

jc ad66

mov a,r2

anl a,#0f0h

swap a

cjne a,#9h,cs1a

jmp en

cs1a:

jc ad06

jnc ad66

jmp en

cs2:

mov 8h,psw

mov a,r2

anl a,#0fh

cjne a,#09h,cs2a

jmp cs2a1

cs2a:

jc cs2a1

jnc cs2a2

cs2a1:

agn:

mov psw,8h

jc ad60

mov 8h,psw

mov a,r2

anl a,#0f0h

swap a

cjne a,#09h,cs2b

jmp ad0

cs2a2:

mov psw,8h

jc ad66

mov a,r2

anl a,#0f0h

swap a

cjne a,#09h,cs2b2

jmp ad06

cs2b:

jc ad0

jnc ad60

cs2b2:

jc ad06

jnc ad66

ad0:

mov a,#0h

add a,r2

jmp en

ad06:

mov a,#06h

jc ad66

mov a,r2

anl a,#0f0h

swap a

cjne a,#09h,cs2b2

jmp ad06

cs2b:

jc ad0

jnc ad60

cs2b2:

jc ad06

jnc ad66

ad0:

mov a,#0h

add a,r2

jmp en

ad06:

mov a,#06h

add a,r2

mov r2,a

jb ac,agn

jmp en

ad60:

mov a,#60h

add a,r2

jmp en

ad66:

mov a,#66h

add a,r2

en:

mov r0,a

mov p2,#0h

mov b,#2

div ab

mov r1,b

cjne r1,#0h,her

setb p2.3

her: jmp her

end

**output:**





**Applications:**

The branch instructions are used to change the sequence of instruction execution. Use branch instructions to change the sequence of instruction execution.BCD numbers are very much important because we can use them to interface the seven segment displays and logical instruction are also helpful to handle data in the form of bits .Comparison instruction is also very much important to compare our data and work according to the result.

**Issues:**

No issues faced.

**Conclusions:**

In this lab we learn about cjne instruction and its iplementaion.the main task is to packed bcd number and add them and also n packed bcd number.

**Lab code**

|  |  |
| --- | --- |
| org 0h  MOV r0,#39h  mov r1,#63h  mov a,r0  add a,r1  mov r2,a  jb ac,cs1  jnb ac,cs2  jmp en  cs1:  jc ad66  mov a,r2  anl a,#0f0h  swap a  cjne a,#9h,cs1a  jmp en  cs1a:  jc ad06  jnc ad66  jmp en  cs2:  mov 8h,psw  mov a,r2  anl a,#0fh  cjne a,#09h,cs2a  jmp cs2a1  cs2a:  jc cs2a1  jnc cs2a2  cs2a1:  agn:  mov psw,8h  jc ad60  mov 8h,psw  mov a,r2  anl a,#0f0h | swap a  cjne a,#09h,cs2b  jmp ad0  cs2a2:  mov psw,8h  jc ad66  mov a,r2  anl a,#0f0h  swap a  cjne a,#09h,cs2b2  jmp ad06  cs2b:  jc ad0  jnc ad60  cs2b2:  jc ad06  jnc ad66  ad0:  mov a,#0h  add a,r2  jmp en  ad06:  mov a,#06h  add a,r2  mov r2,a  jb ac,agn  jmp en  ad60:  mov a,#60h  add a,r2  jmp en  ad66:  mov a,#66h  add a,r2  en:  end |

**output:**



