EXPERIMENT-9

HARDWARE INTERFACING – STEPPER MOTOR

Aim: To Interface a stepper motor to 8086 Microprocessor through 8255

Programmable Peripheral Interface (PPI).

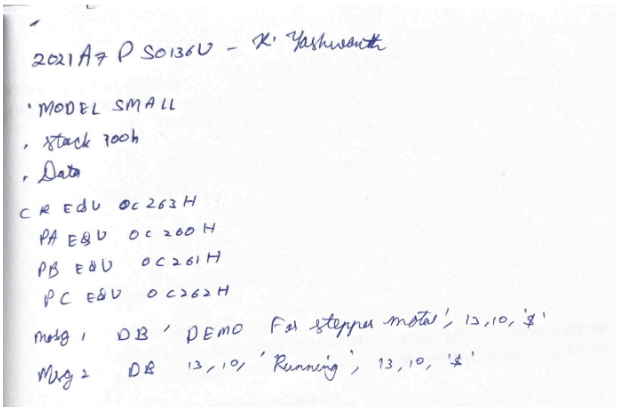
Equipment's:

- PC with Linux operating system Loaded
- 8255 Interfacing card (PCI Card)
- Stepper Motor Driver board
- Stepper Motor

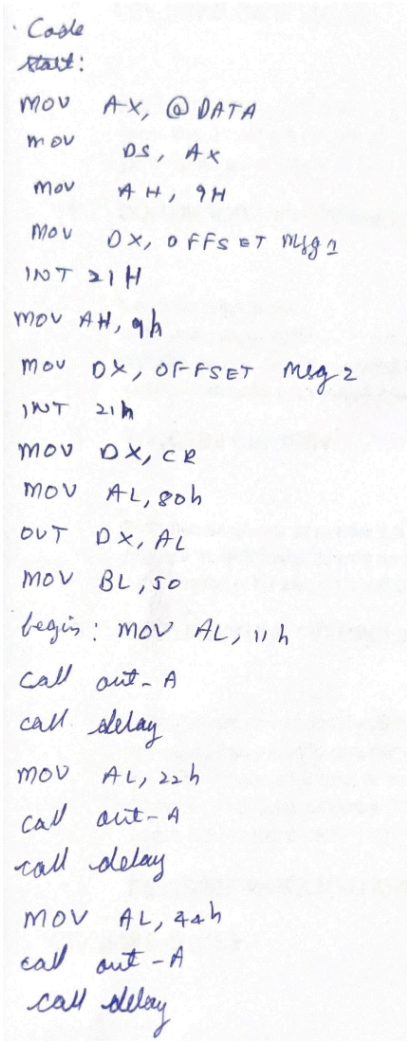
Video recording of demonstration:

[lab9-aim_op_2021A7PS0136U.mp4]

Assembly language program to rotate the Stepper Motor:



```
2021A7PS0136U - K. Yashwanth
.MODEL SMALL
.stack 100h
.Data
CR EQU 0C263H
PA EQU 0C260H
PB EQU 0C261H
PC EQU 0C262H
msg1 DB 'DEMO For stepper motor', 13,10, '$'
Msg2 DB 13,10,'Running', 13,10, '$'
```



```
.Code
start:
MOV AX, @DATA
mov DS, AX
mov AH, 9H
MOV DX, OFFSET Msg1
INT 21H
MOV AH, 9h
MOV DX, OFFSET Msg2
INT 21h
MOV DX, CR
MOV AL, 80h
OUT DX, AL
MOV BL, 50
begin: MOV AL, 11h
call out_A
call delay
MOV AL, 22h
call out-A
call delay
MOV AL, 44h
call out-A
call delay
```

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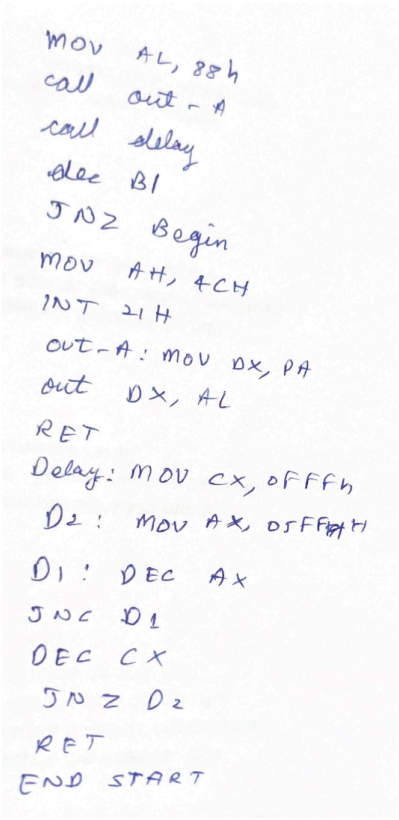


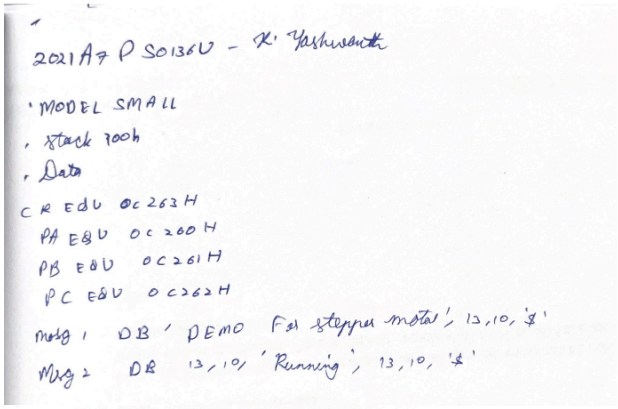
```
MOV AL, 88h
call out-A
call delay
dec B1
JNZ Begin
MOV AH, 4CH
INT 21H
out-A: MOV DX, PA
out DX, AL
RET
Delay: MOV CX, 0FFFh
D2: MOV AX, 05FFFH
D1: DEC AX
JNC D1
DEC CX
JNZ D2
RET
END START
```

Assignment problems:

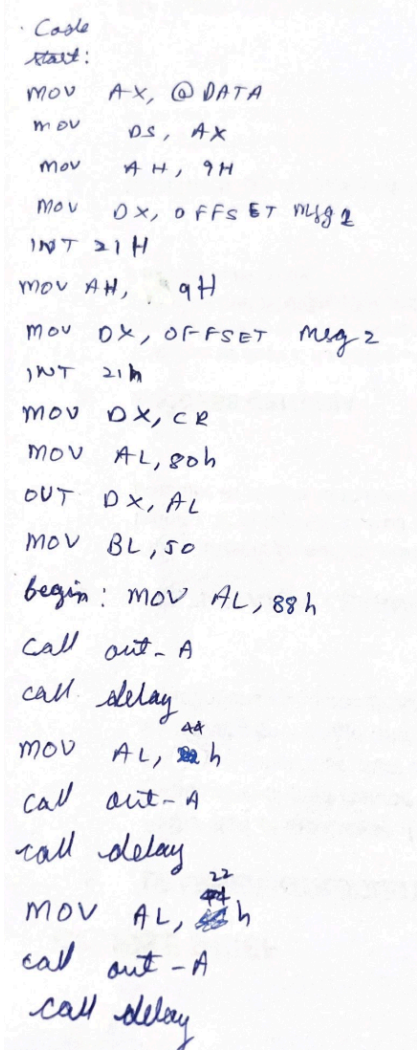
Assembly language program and video recording to rotate the Stepper Motor in reverse direction:

Video recording of assignment circuit simulation:

[lab9-asgn1_op_2021A7PS0136U.mp4]



```
2021A7PS0136U - K. Yashwanth
.MODEL SMALL
.stack 100h
.Data
CR EQU 0C263H
PA EQU 0C260H
PB EQU 0C261H
PC EQU 0C262H
msg1 DB 'DEMO For stepper motor', 13,10, '$'
Msg2 DB 13,10, 'Running', 13,10, '$'
```



```
.code
start:
MOV AX, @DATA
mov DS, AX
mov AH, 9H
MOV DX, OFFSET Msg2
INT 21H
MOV AH, 9H
MOV DX, OFFSET Msg2
INT 21h
MOV DX, CR
MOV AL, 80h
OUT DX, AL
MOV BL, 50
begin: MOV AL, 88h
Call out_A
call delay
MOV AL, 44h
Call out-A
call delay
MOV AL, 22h
call out-A
call delay
```

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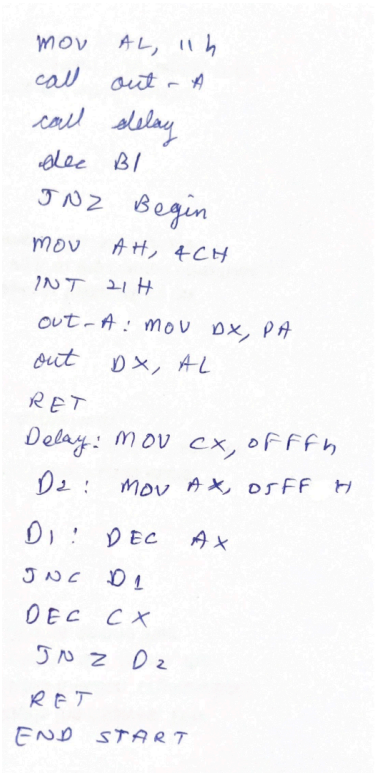

```
MOV AL, 11h
call out-A
call delay
dec BL
JNZ Begin
MOV AH, 4CH
INT 21H
OUT-A: MOV DX, PA
out DX, AL
RET
Delay: MOV CX, 0FFFh
D2: MOV AX, 05FF H
D1: DEC AX
JNC D1
DEC CX
JNZ D2
RET
END START
```

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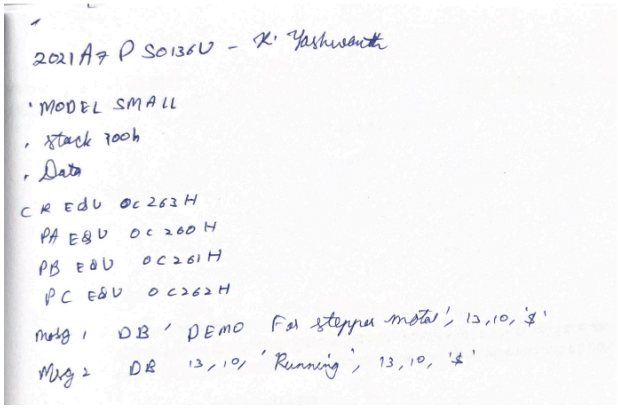
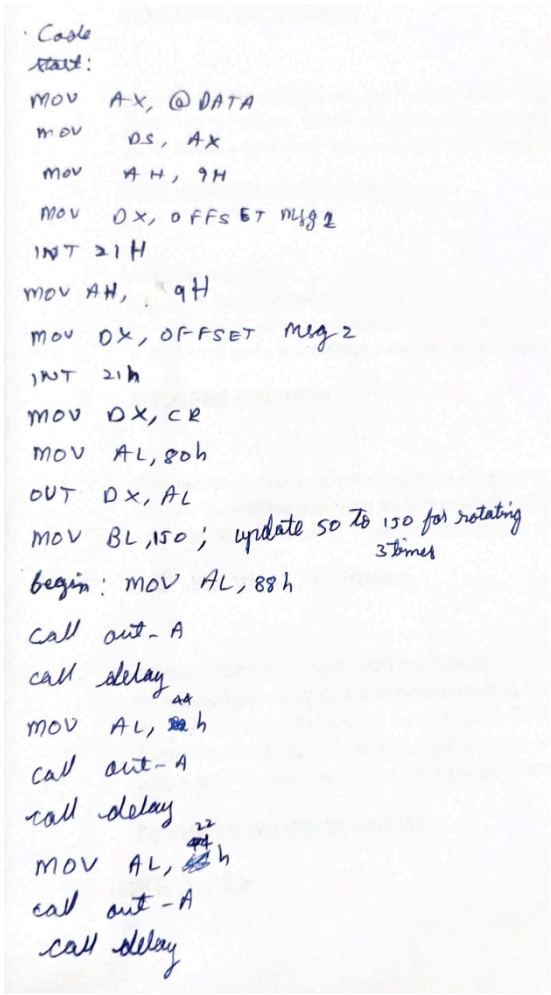
Assembly language program and video recording to rotate the Stepper Motor 3 times in any direction:

[lab9-asgn2_op_2021A7PS0136U.mp4]



```
2021A7PS0136U - K. Yashwanth
.MODEL SMALL
.stack 100h
.Data
CR EQU 0c263H
PA EQU 0C260H
PB EQU 0C261H
PC EQU 0C262H
msg1 DB 'DEMO For stepper motor', 13,10, '$'
Msg2 DB 13,10, 'Running', 13,10, '$'
```



```
.Code
start:
MOV AX, @DATA
mov DS, AX
mov AH, 9H
MOV DX, OFFSET Msg1
INT 21H
MOV AH, 9H
MOV DX, OFFSET Msg2
INT 21h
MOV DX, CR
MOV AL, 80h
OUT DX, AL
MOV BL, 150 ; update 50 to 150 for rotating 3 times
begin: MOV AL, 88h
call out-A
call delay
MOV AL, 44h
call out-A
call delay
MOV AL, 22h
call out-A
call delay
```

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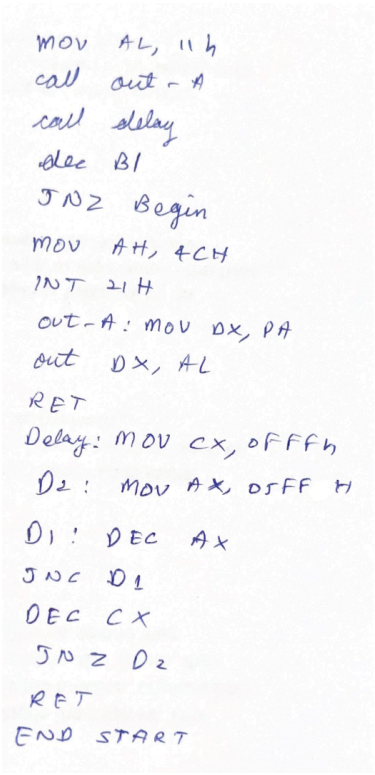

```
MOV AL, 11h
call out-A
call delay
dec BL
JNZ Begin
MOV AH, 4CH
INT 21H
OUT-A: MOV DX, PA
out DX, AL
RET
Delay: MOV CX, 0FFFh
D2: MOV AX, 05FF H
D1: DEC AX
JNC D1
DEC CX
JNZ D2
RET
END START
```