LAPORAN RESMI
PRAKTIKUM 12 ARSITEKTUR KOMPUTER

“TEMPERATURE SENSOR LCD INTERFACING”

Disusun Oleh :
Izzuddin Ahmad Afif (2421600011)

Dosen :
Mohamad Ridwan S.T., M.T.

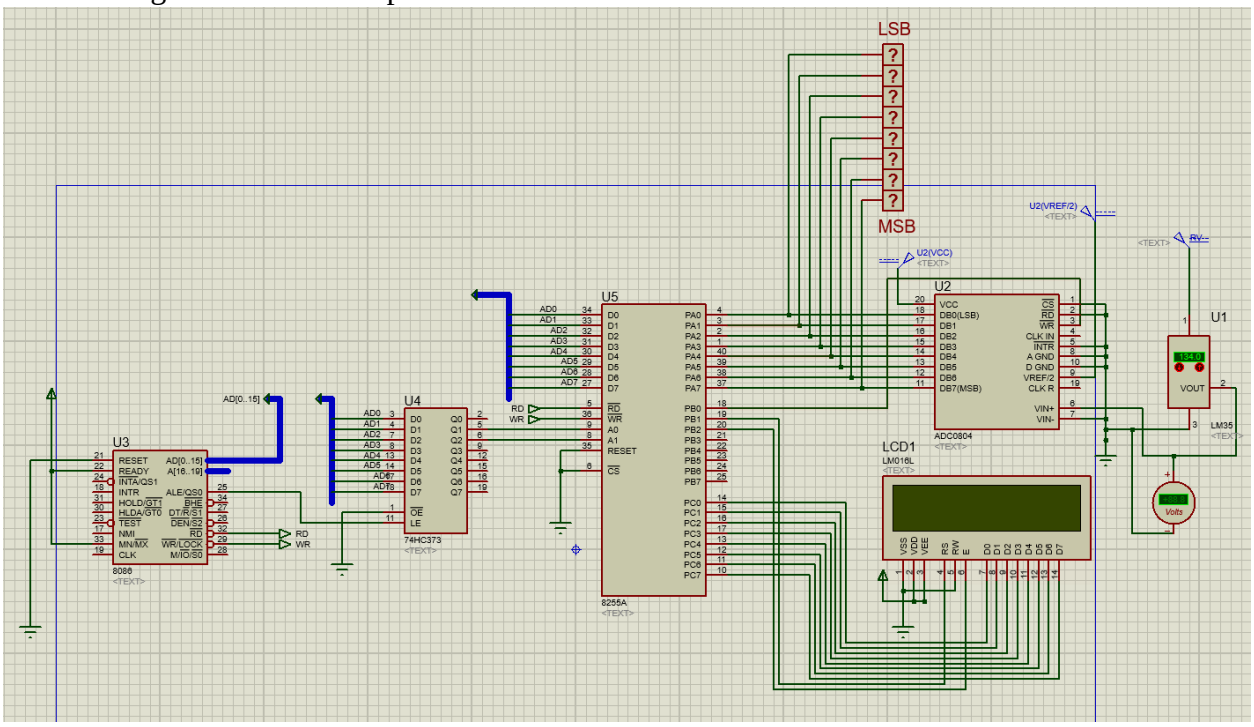
PROGRAM STUDI SARJANA TERAPAN TEKNOLOGI REKAYASA INTERNET
DEPARTEMEN TEKNIK ELEKTRO
POLITEKNIK ELEKTRONIKA NEGERI SURABAYA

2021/2022

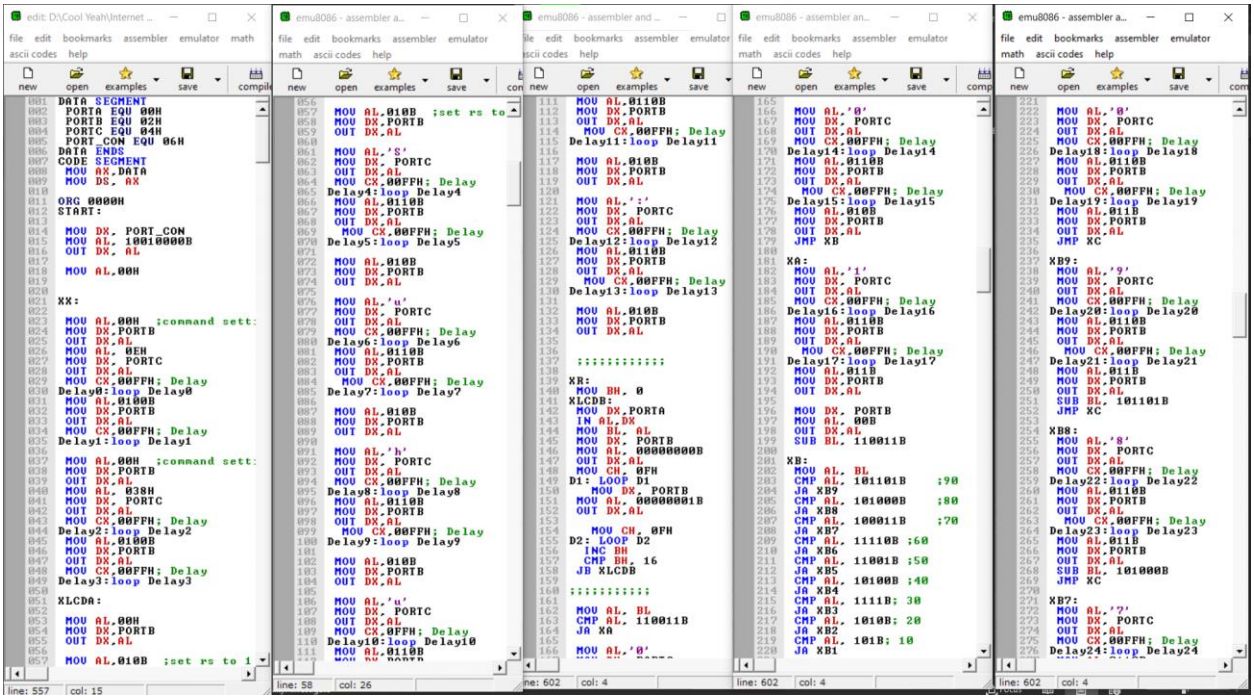
BAB III
ANALISA DAN KESIMPULAN

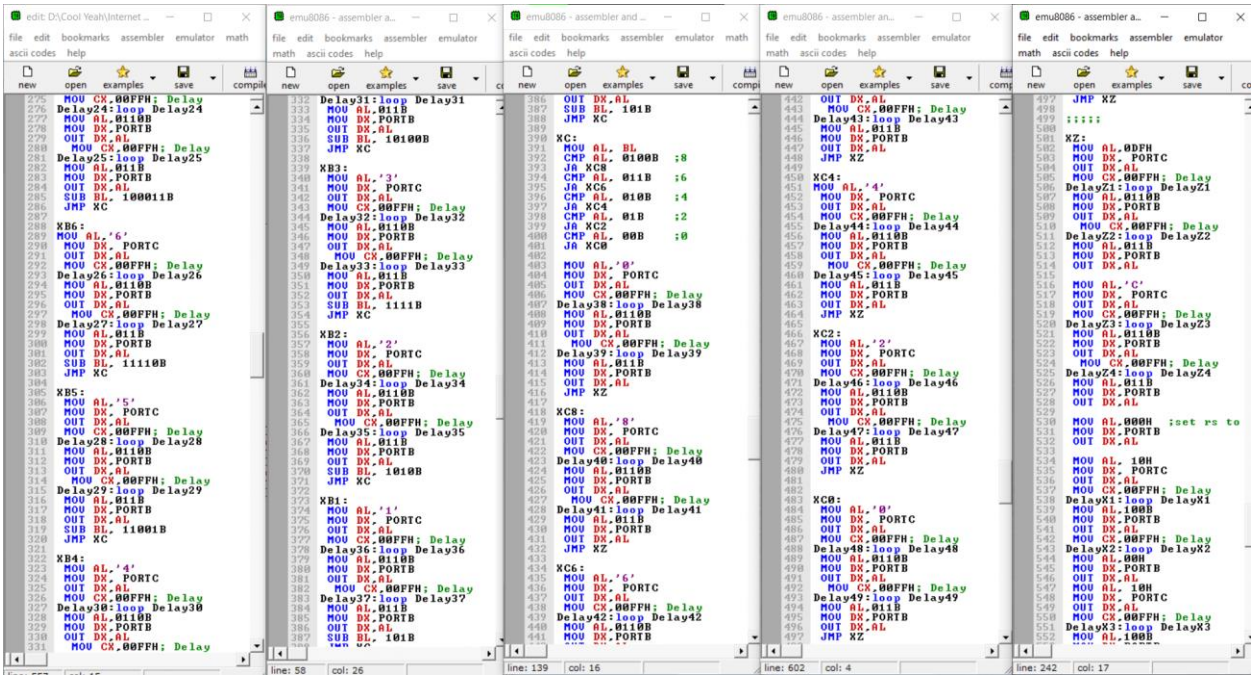
3.1 Hasil Praktikum

1. Rangkaian Sensor temperatur

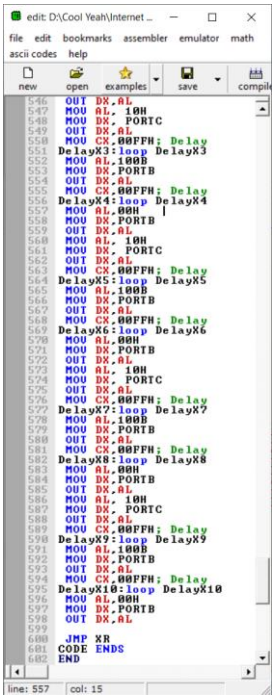


2. Source code:





```
MOV CX,00FFH; Delay
Delay24:loop Delay24
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay25:loop Delay25
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 SUB BL, 100011B
 JMP XC

XB6:
MOV AL,'6'
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay26:loop Delay26
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay27:loop Delay27
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 SUB BL, 11110B
 JMP XC

XB5:
 MOV AL,'5'
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay28:loop Delay28
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay29:loop Delay29
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 SUB BL, 11001B
 JMP XC

XB4:
 MOV AL,'4'
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay30:loop Delay30
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay31:loop Delay31
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 SUB BL, 10100B
 JMP XC

XB3:
 MOV AL,'3'
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay32:loop Delay32
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay33:loop Delay33
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 SUB BL, 1111B
 JMP XC

XB2:
 MOV AL,'2'
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay34:loop Delay34
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay35:loop Delay35
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 SUB BL, 1010B
 JMP XC

XB1:
 MOV AL,'1'
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay36:loop Delay36
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay37:loop Delay37
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 SUB BL, 101B
 JMP XC

XC:
 MOV AL, BL
 CMP AL, 0100B  ;8
 JA XC8
 CMP AL, 011B   ;6
 JA XC6
 CMP AL, 010B   ;4
 JA XC4
 CMP AL, 01B    ;2
 JA XC2
 CMP AL, 00B    ;0
 JA XC0

 MOV AL,'0'
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay38:loop Delay38
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay39:loop Delay39
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 JMP XZ

XC8:
 MOV AL,'8'
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay40:loop Delay40
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay41:loop Delay41
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 JMP XZ

XC6:
 MOV AL,'6'
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay42:loop Delay42
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay43:loop Delay43
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 JMP XZ

XC4:
 MOV AL,'4'
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay44:loop Delay44
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay45:loop Delay45
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 JMP XZ

XC2:
 MOV AL,'2'
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay46:loop Delay46
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay47:loop Delay47
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 JMP XZ

XC0:
 MOV AL,'0'
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay48:loop Delay48
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
Delay49:loop Delay49
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL
 JMP XZ

 JMP XZ
;;;;;
XZ:
 MOV AL,0DFH
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayZ1:loop DelayZ1
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayZ2:loop DelayZ2
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL

 MOV AL,'C'
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayZ3:loop DelayZ3
 MOV AL,0110B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayZ4:loop DelayZ4
 MOV AL,011B
 MOV DX,PORTB
 OUT DX,AL

 MOV AL,000H  ;set rs to
 MOV DX,PORTB
 OUT DX,AL

 MOV AL, 10H
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayX1:loop DelayX1
 MOV AL,100B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayX2:loop DelayX2
 MOV AL,00H
 MOV DX,PORTB
 OUT DX,AL
 MOV AL, 10H
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayX3:loop DelayX3
```

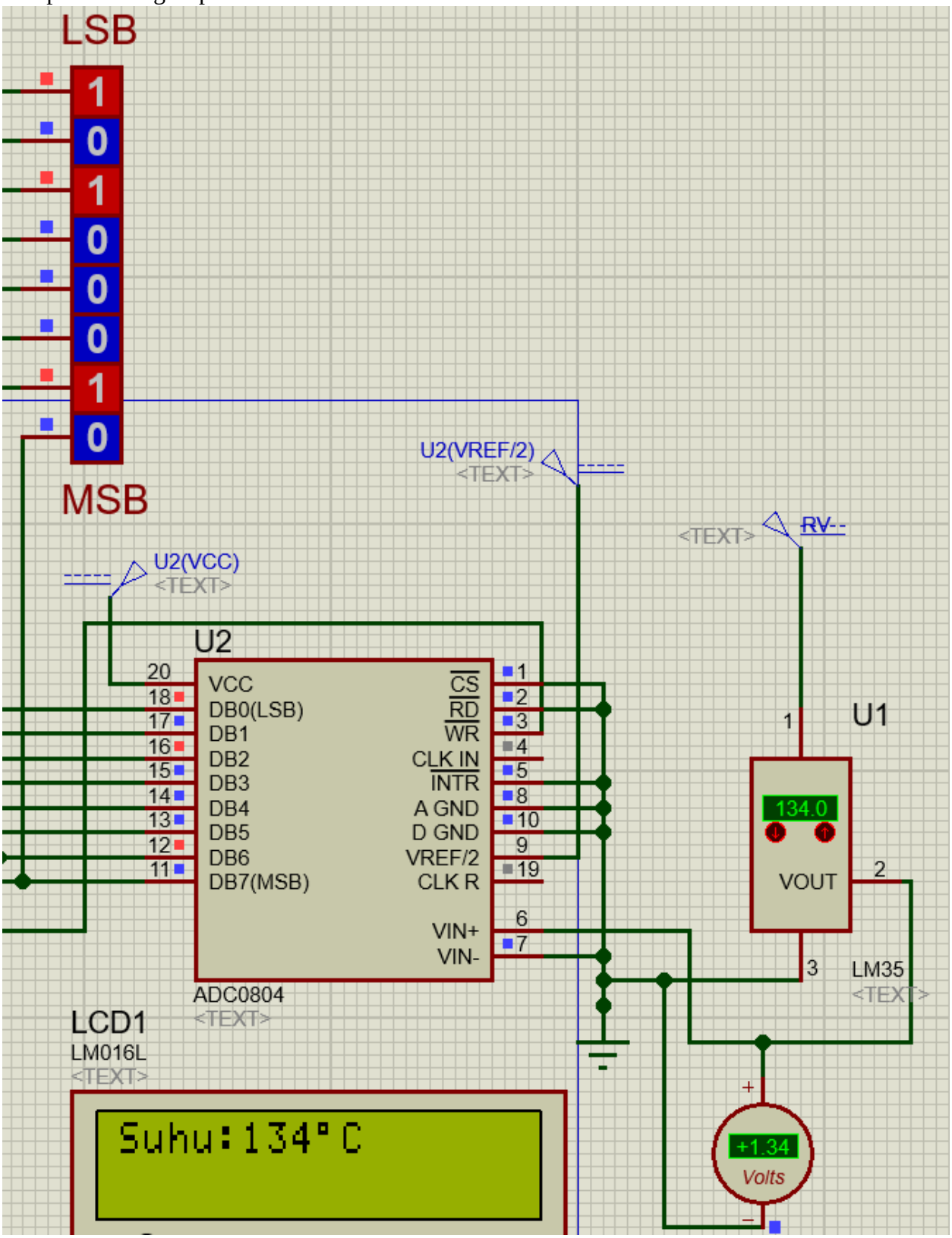


```
 OUT DX,AL
 MOV AL, 10H
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayX3:loop DelayX3
 MOV AL,100B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayX4:loop DelayX4
 MOV AL,00H
 MOV DX,PORTB
 OUT DX,AL
 MOV AL, 10H
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayX5:loop DelayX5
 MOV AL,100B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayX6:loop DelayX6
 MOV AL,00H
 MOV DX,PORTB
 OUT DX,AL
 MOV AL, 10H
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayX7:loop DelayX7
 MOV AL,100B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayX8:loop DelayX8
 MOV AL,00H
 MOV DX,PORTB
 OUT DX,AL
 MOV AL, 10H
 MOV DX, PORTC
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayX9:loop DelayX9
 MOV AL,100B
 MOV DX,PORTB
 OUT DX,AL
 MOV CX,00FFH; Delay
DelayX10:loop DelayX10
 MOV AL,00H
 MOV DX,PORTB
 OUT DX,AL

 JMP XR
CODE ENDS
END
```

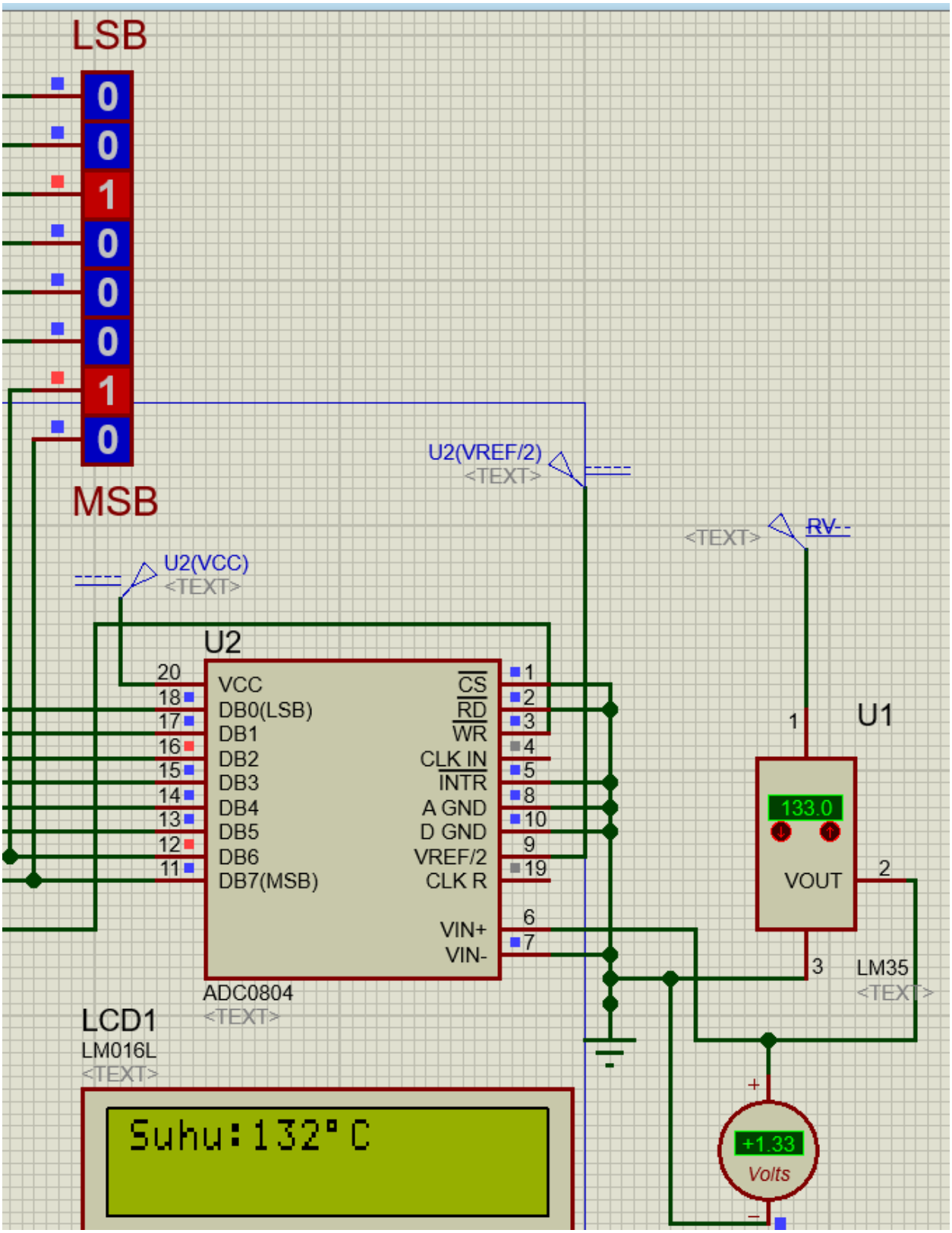
(600an baris pak hehe)

3. Hasil

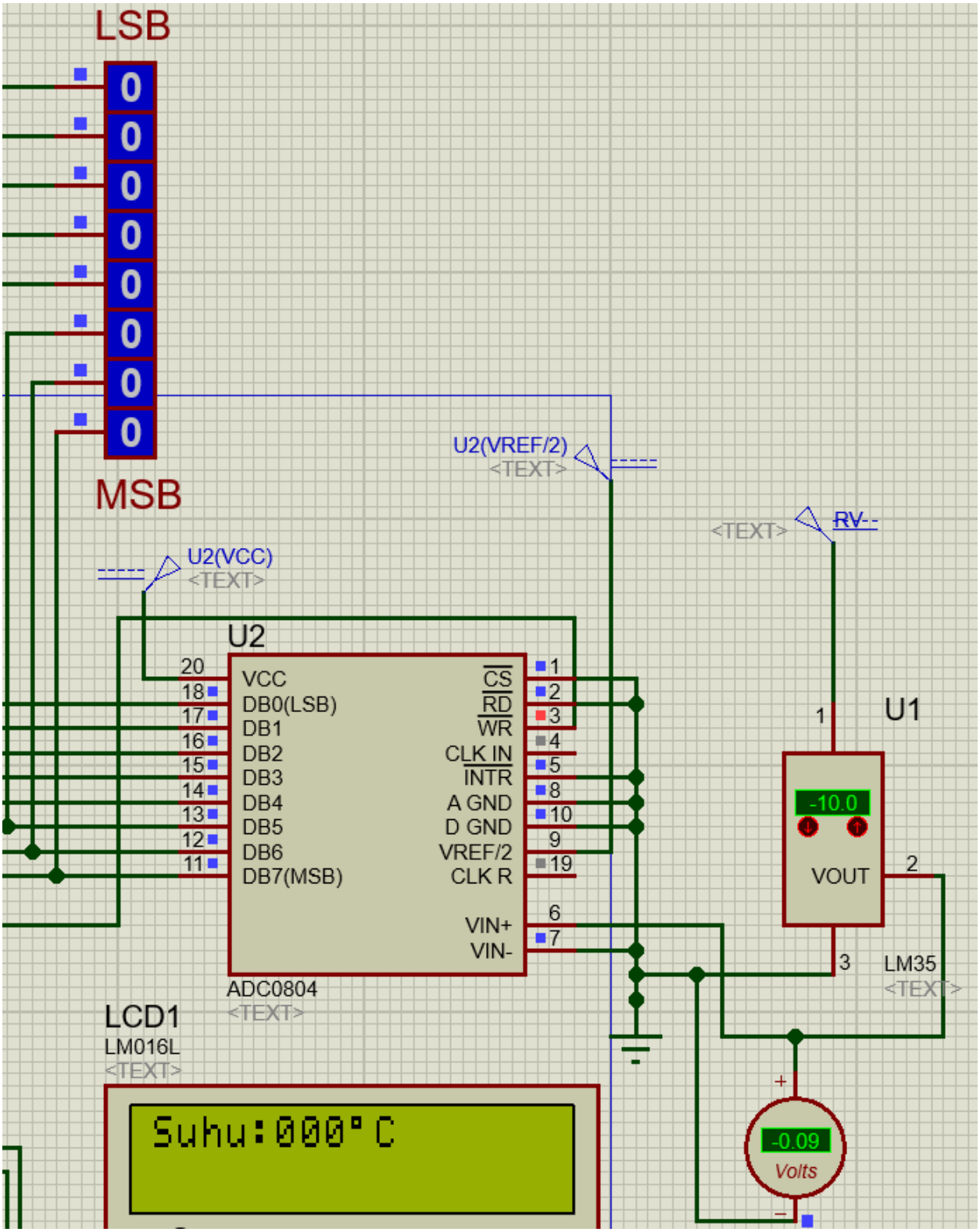
Tampilan suhu genap:



Tampilan suhu ganjil:



Tampilan suhu negative:



3.2 Analisa Praktikum

Pada percobaan kali ini, kita membuat rangkaian interfacing LCD untuk sensor suhu, dengan menggunakan perangkat lm35 sebagai sensor yang mengubah sinyal analog suhu menjadi sinyal analog listrik, kemudian kita sambungkan dengan ADC untuk mengkonversi dari sinyal analog listrik ke sinyal digital, yang kemudian dari sinyal digital itu kita olah sedemikian rupa dengan assembly 8086 untuk menjadi tampilan LCD. Dengan menggunakan VREF 5V, dan nilai V maks dari lm35 adalah 1.5V, serta nilai maks dari 8 bits output ADC (256 step), kita dapatkan nilai step sebesar sekitar 76,5. Dari nilai step tersebut, saya mengonversi menjadi tampilan lcd dengan seleksi substraksi ratusan, puluhan dan satuan. Kelemahan dari rangkaian saya ini adalah hanya menunjukkan nilai kelipatan 2, karena 1 step bernilai sekitar 1,96 Volt, jadi saya bulatkan, serta tidak dapat menampilkan hasil suhu dibawah 0, karena sinyal dari ADC akan tetap 0000 0000 setelah suhu melewati 0 derajat.

3.3 Kesimpulan

1. Kita mempelajari tentang Interfacing LCD sensor suhu
2. Kita belajar tentang konversi sinyal analog ke digital