BMI-Calculator - Assembly Project

Using 8086 MicroProcessor

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In this project we use some new syntax and the details is given bellows-

INT 21h

- **Here INT 21h is used for getting input.**

AND AX, 000FH

- **For converting the character into digit.**

PUSH AX

- **For keeping the value of AX into the stack.**

POP AX

- **For getting the value of AX from the stack.**

MUL BX

- **For multiplying the value of AX with BX.**

CMP AL, 0DH

- **For comparing the value of AL with Enter.**

DIV BX

- **For dividing the value of AX by BX.**

We also use a WORD variable SUM.

Project Description:

- **BMI is a way of checking that a person is a healthy weight for their height.**
- **For your height and weight there will be a healthy range which you should fit into, this range is to account for the fact people have different builds and sizes.**
- **for 8086 we could just use AH and AL registers or any 16 bit registers for our calculations but the Actual BMI formula required larger registers to handle so we used simple algorithm to calculate it with less accuracy which is [Height -100 then add 5 and subtract 5 from the result and store it then compare the weight with the two results to make sure that it is in range of perfection or overweight or under weight**

In this project we input our height (in cm) and weight (in kg) and its show me the result that my weight is OVER or PERFECT or UNDER.

In this project basically we had done the work of PUSH, POP, MUL, DIV and other commanding thing like JMP, LOOP, and CMP etc.

Now we will discuss about some important part of our project code.

```
043         MOV  ax,@data
044         mov  ds,ax
045
046         lea  dx,msa
047         mov  ah,9
048         int  21h
049
```

The above picture is the part of our code, use for printing any kind of massage. So, we will use this command and print all massage in our project by using this part of code.

```
116
117   input:
118
119       and ax,000Fh
120       push ax
121       mov ax,10
122       mul bx
123       mov bx,ax
124       pop ax
125       add bx,ax
126
127       mov ah,1
128       int 21h
129
130       cmp al,0dh
131       je print
132
133
134       jmp input
135
```

The above picture is the part of our code, used for any kind of decimal input that is HEGHT of the user in cm.

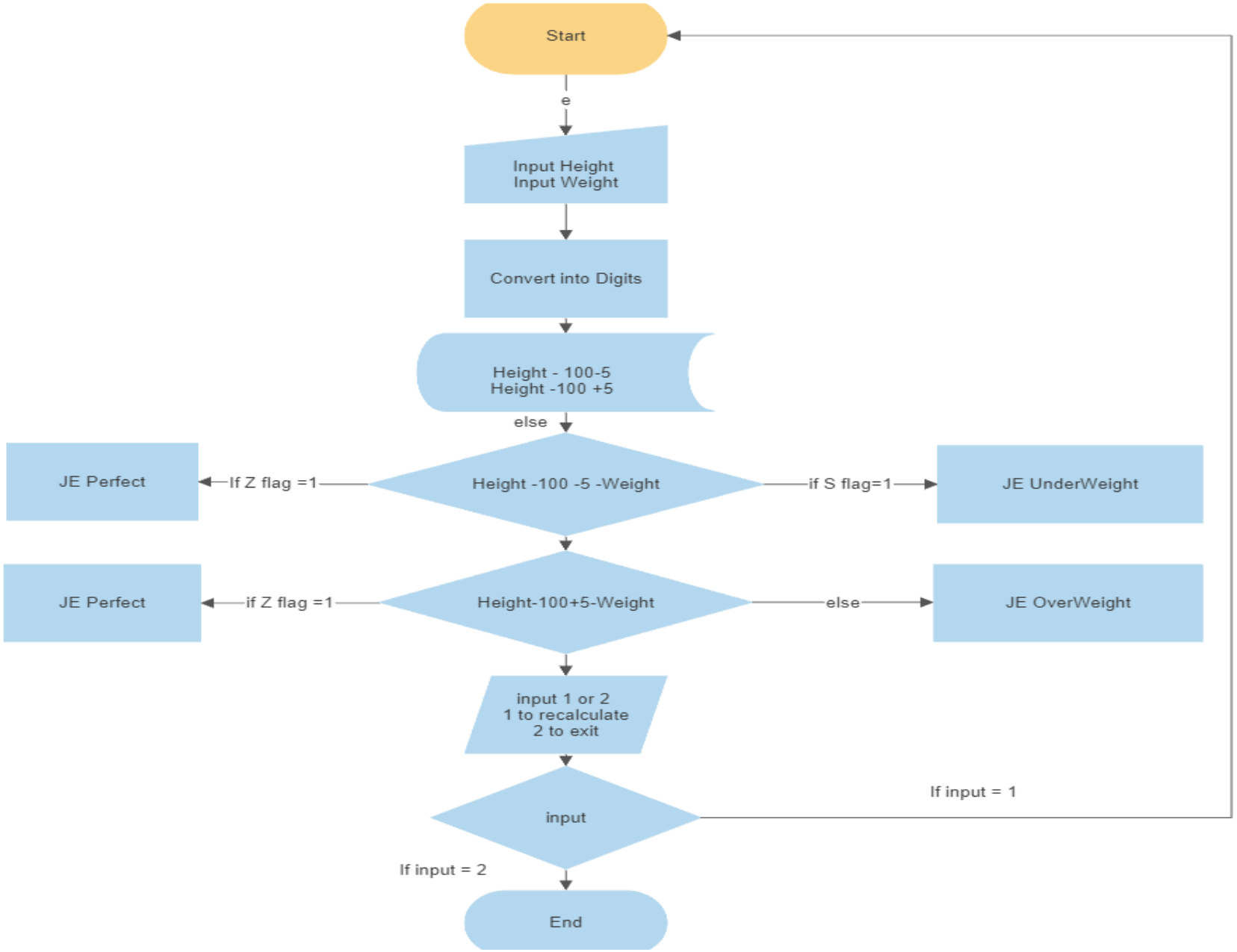
```
157    input2:
158
159      and ax,000Fh
160      push ax
161      mov ax,10
162      mul bx
163      mov bx,ax
164      pop ax
165      add bx,ax
166
167      mov ah,1
168      int 21h
169
170      cmp al,0dh
171      je convert
172
173      jmp input2
174
```

The above picture is the part of our code, use for 2nd input that is the WEIGHT of the user in kg.

```
130
131         CONUERT:
132
133
134         MOV  CX,H
135
136         SUB  SUM,CX
137
138         MOV  DX,SUM
139
140         SUB  DX,F
141
142         SUB  DX,BX
143
144
145         LAHF
146
147         MOV  AL,AH
148
149         SHR  AL,6
150         AND  AL,1
151         CMP  AL,1
152         JE  PERFECT
153
154
155
156
157         SHR  AH,7
158         AND  AH,1
159         CMP  AH,0
160         JE  UNDER
161
162          MOV  DX,SUM
163         ADD  DX,F
164
165         SUB  DX,BX
166
167         LAHF
168
169         SHR  AH,7
170         AND  AH,1
171
172         CMP  AH,0
173         JE  PERFECT
174
175         JMP  OUER
176
177
```

The above picture is the part of our code, use for conversion, that is the BMI of the user. In the last part of the program, we show some instructions for the user. If He or She has Overweight, then have some instructions and if He or She has Underweight then have some instructions.

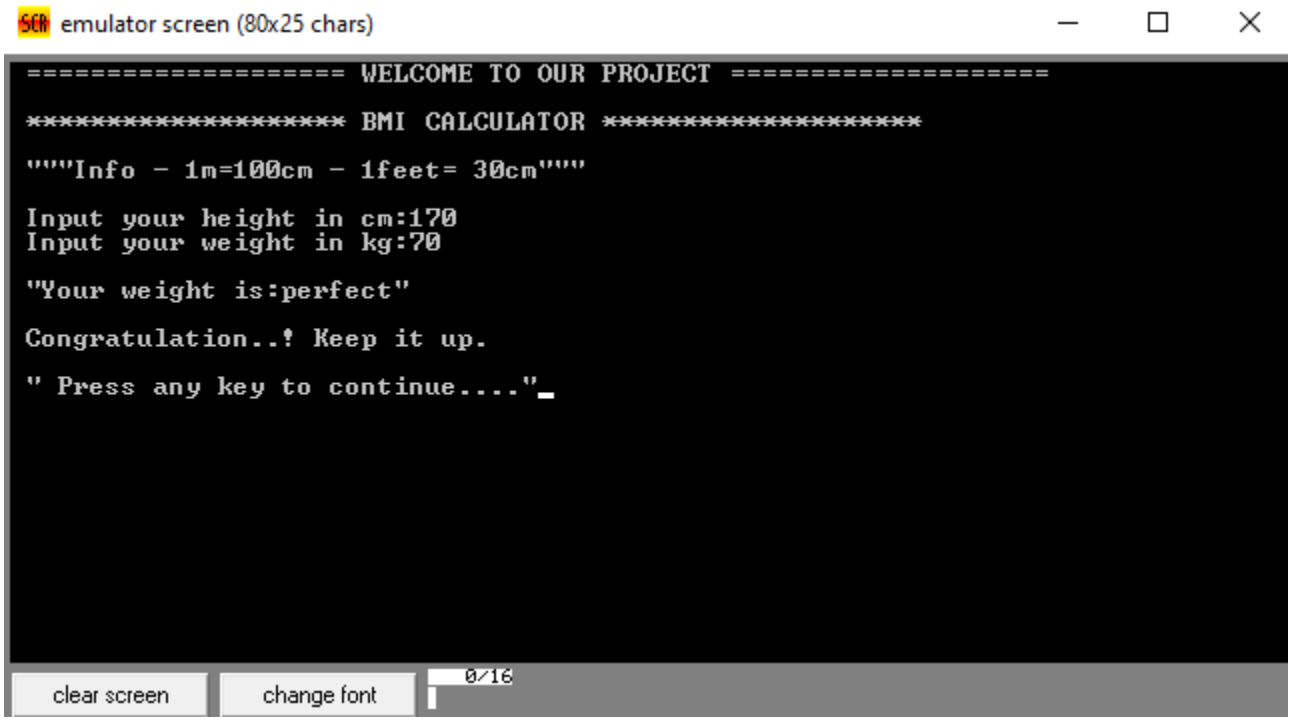
Flow chart:


Start
e
Input Height
Input Weight
Convert into Digits
Height - 100-5
Height -100 +5
else
JE Perfect
If Z flag =1
Height -100 -5 -Weight
if S flag=1
JE UnderWeight
JE Perfect
if Z flag =1
Height-100+5-Weight
else
JE OverWeight
input 1 or 2
1 to recalculate
2 to exit
input
If input = 1
If input = 2
End

Experimental Result:

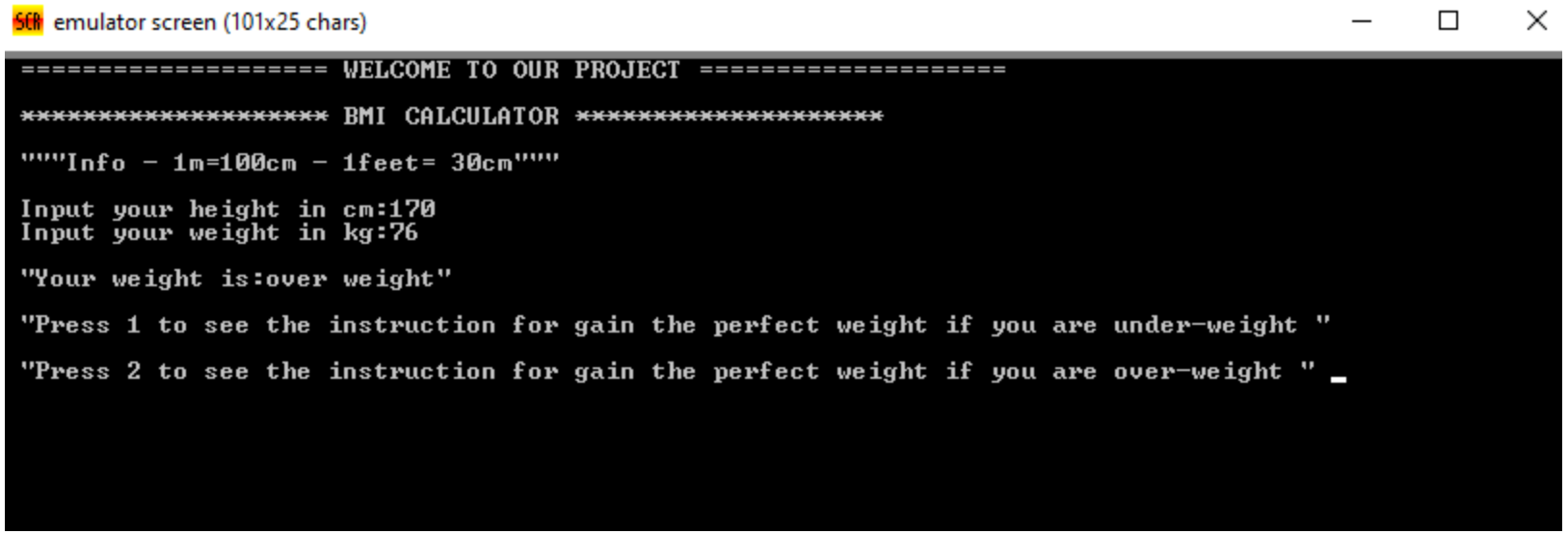
In this project we use many things. Emu 8086 like

- **Ascii code**
- **Loop, JMP, CMP, SUB,LAHF,AND ,PUSH,POP,etc...**

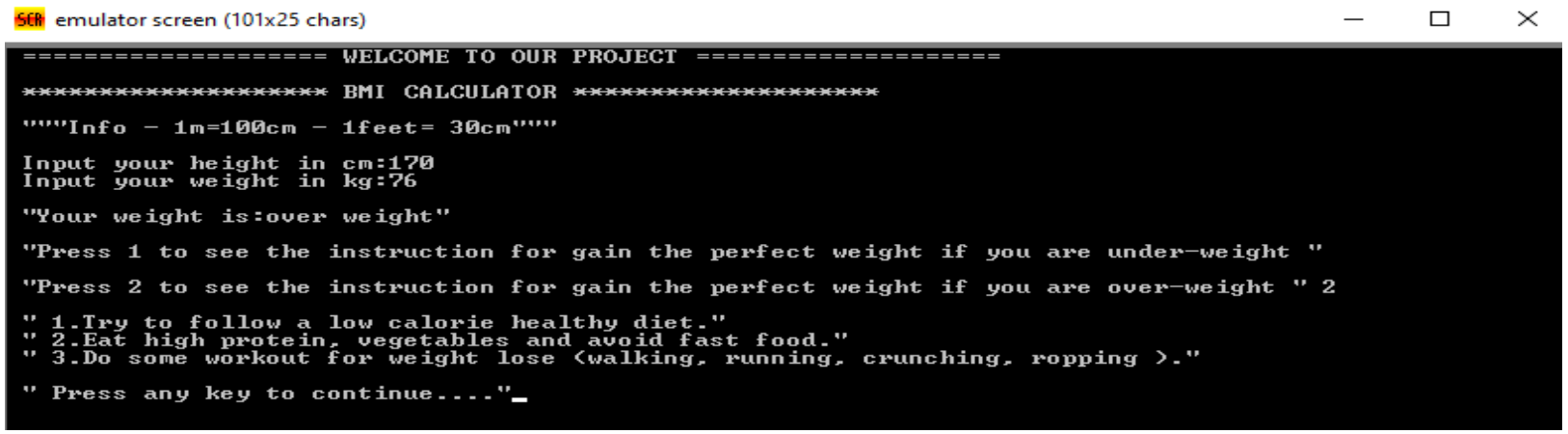


Here is a short example for perfect weight.

Next we can see that there have 2 instructions. After pressing 1 we can see that how can we gain our perfect weight if we are in under weight.



If we press 2 then we can see that how can we gain our perfect weight if we are in over weight.



Advantage:

- **Easy to calculate.**
- **Easy to Understand.**
- **Inspired to learn more**
- **Inspired to know more**
- **We can find our mass index and take proper steps for keeping fit our body at any time.**

Disadvantage:

- **We can't find actual BMI.**
- **This process can't take floating number and can't gave actual weight.**

Future Work:

The BMI calculator provides innumerable opportunities for further investigation into the evolution of a task prioritization scheme within a dynamically changing ,randomly updated environment

Conclusion:

This project is interesting and helpful. The BMI calculator is inspired to create other calculator. We have completed our project and obtain more experience.