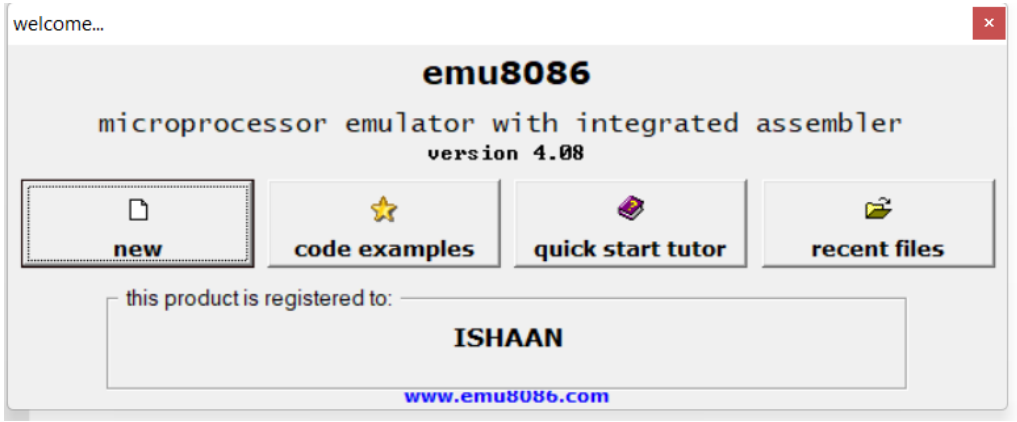
8086

Binary Search
https://github.com/ahmedokka29/microprocessor8086-project

Introduction

- In our project we use the x86 assembly language to build a Binary search algorithm in which we used a lot of what we have learned in our microprocessor course and from our own research.
- We used emu8086 to assemble and run our program.



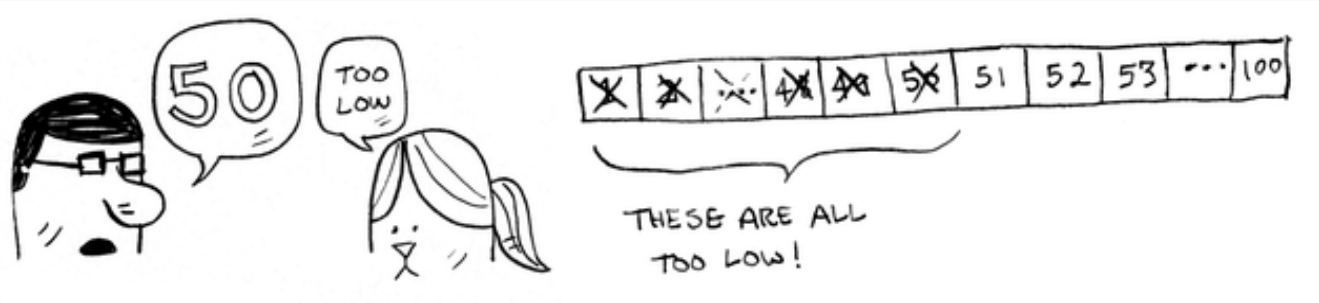
Binary Search

- Binary search is an algorithm; its input is a sorted list of elements. If an element you're looking for is in that list, binary search returns the position where it's located. Otherwise, binary search returns null.

Binary Search

- Here's an example of how binary search works. I'm thinking of a number between 1 and 100.

Start with 50.

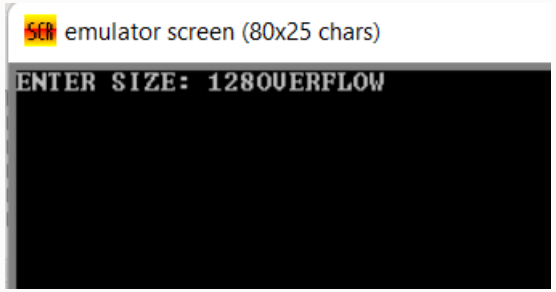


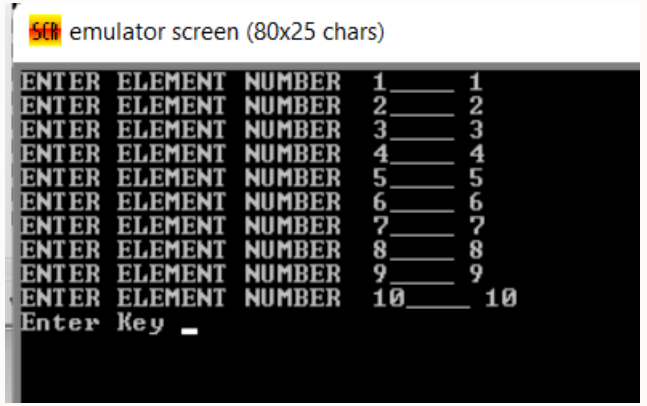
Too low, but you just eliminated *half* the numbers! Now you know that 1–50 are all too low. Next guess: 75.

Too high, but again you cut down half the remaining numbers! *With binary search, you guess the middle number and eliminate half the remaining numbers every time*. Next is 63 (halfwave between 50 and 75).

How our program work

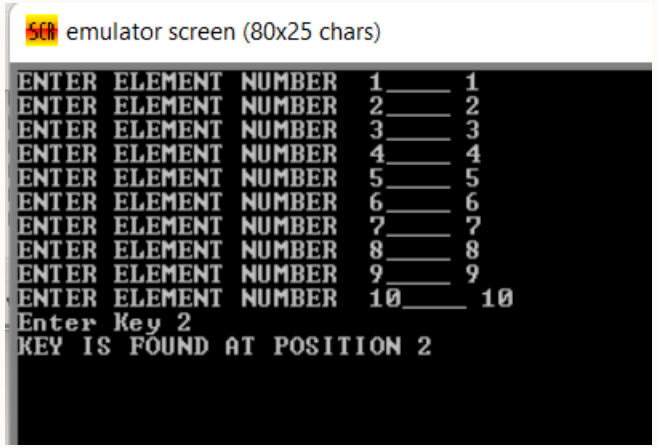
- Firstly, our program can save and array up to 127 elements only greater than 127 the program terminates and shows that as overflow.
- After that the user writes each element of the array in a loop, 0<=arr[i]<127.
- After filling the list, the user is supposed to enter the key to search for, which also must be in the range 0<s<127.





How our program work

- After filling the list, the program give the user the opportunity to search on certain key the user choose it and the program displays its position
  note: All entered numbers even in search must not exceed 127



edit: C:\Users\ahmed\OneDrive\Desktop\mycode.asm

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new open examples save compile emula

```
.MODEL SMALL
.STACK
.DATA
ARR DB 127 DUP(?)
number DB 0
SOLVE DB 0
nunberplace db 10
KEY DB 0DH
;Messages defenitions
MSG1 DB "KEY IS FOUND AT POSITION
MSG2 DB "KEY NOT FOUND!!! $"
MSG3 DB "ENTER SIZE: $"
MSG4 DB "ENTER ELEMENT NUMBER  $"
MSG5 DB "_____ $"
MSG6 DB "OVERFLOW $"
MSG7 DB "NOTSORTED ENTER AGAIN $"
MSG8 DB "Enter Key $"
INDEX DB 0
SIZE DB 0
messageinvalidcharacter db "Invali
messageinputnunber db "Please Inpu


.CODE
.STARTUP
MOV AX,@DATA
MOV DS,AX
STR:
MOV number,0
; display welcome messege
LEA DX,MSG3
MOV AH,09H
INT 21H

CALL ENTER
MOV SIZE,AL


MOV CL,0


;array elements begin
ARR_LOOP:

CMP CL,SIZE
JE ARR_END


LEA DX,MSG4
MOV AH,09H
INT 21H

MOV AL,CL
INC AL
MOV AH,0
CALL PRINT
LEA DX,MSG5
```

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File Edit View Profile Scene Collection Tools Help

Display Capture | Properties | Filters | Display | Display 1: 1920x1080 @ 0,0 (Primary Monitor)

Scenes: Scene

Sources: Display Capture, Audio Output Capture, Window Capture

Audio Mixer: Audio Output Capture 0.0 dB, Desktop Audio 0.0 dB, Mic/Aux 0.0 dB

Scene Transitions: Fade, Duration 300 ms

Controls: Start Streaming, Start Recording, Start Virtual Camera, Studio Mode, Settings, Exit

LIVE: 00:00:00 REC: 00:00:00 CPU: 1.2%, 30.00 fps

ENG US 9:31 PM 1/6/2022

Team Members

Sayed Hassan

- https://github.com/9mm-bot

Ziad Mohamed

- https://github.com/ZiadSENG

Ibrahim Mohamed

- https://github.com/hemagazzar

Ahmed Tarek

- https://github.com/ahmedashour28

Ahmed Okka

- https://github.com/ahmedokka29

Thanks for your attention