Computer Architecture (Assembly Language smz32v50)

Question:
1. What is assembly language? Why do we study assembly language?
2. What are the differences between assembly X86, ARM, SMZ32V50
3. Describe the CPU role and BUS role in assembly language
4. What is Register in assembly language? How many types of registers in assembly language?

Exercise:
1) Using SUB, DIV, MUL, and try to use register CL and DL
2) Followed by question 01 as traffic light
a. Make the left traffic light pop up red light and right blue light (label: right-forward)
b. Reverse (a) (label: left-forward)
c. Make the right traffic light pop up all colors (label: all-color-right)
d. By following from above make the real traffic light (left traffic light => LTL and right traffic light => RTL).
   i. LTL (red) and RTL (green)
   ii. LTL (red) and RTL (amber)
   iii. LTL (red and amber) and RTL (red)
   iv. LTL (green) and RTL (red)
   v. LTL pop up 3 times (amber) and RTL (red)
   vi. LTL (red) and RTL (red and amber)
   vii. Repetition as before, with reverse.
3) Lookup “GIC@I212-2026” as ASCII code and copy address to CO, C1, C2,..C11.

Keyword:

- Using 4 registers: AL, BL, CL, DL (8-bit CPU)
- IS: Instruction set and they have MOV, ADD, SUBTRACT
- SP: refer to the stack point register used to keep track
- SR: status register contains I, S, O, and Z flags
- S: The sign flag is set if a calculation gives a negative result.
- I: hardware interrupts enabled flags.
- O: The overflow flag is set if a result is too big to fit in 8 bits
- Z: The zero flag is set if a calculation gives a zero result
- SUB: subtract
- MOV: copy
- DIV: divide
- MUL: multiple
- We can’t use MOV CO, AL => MOV [CO], AL
- https://www.rapidtables.com/convert/number/binary-to-hex.html
- https://www.ascii-code.com/