

1. [5 points] Write an assembly language program to count the number of bits which are set to 1 in the byte at memory location 70H. Write the answer to memory location 71H. The byte at memory location 70H should remain unchanged after the execution of your program.
2. [15 points] Suppose twenty 8-bit integers belonging to the range $\{0, 1, 2, \dots, 127\}$ are stored in memory locations 40H to 53H. Write an assembly language program to find the largest and second largest integers in this list. Store the largest integer in memory location 70H and the second largest integer in memory location 71H. The list of 20 integers should remain unchanged after the execution of your program. *Hint: Use the SUBB instruction to implement integer comparison.*

TA Checkpoints

1. Check that the student knows how to create a new project in Keil μ Vision with the right settings for the Pt-51 board.
2. Check that the student knows how to add an assembly language program to the project.
3. Check that the student knows how to compile the assembly program.
4. Check that the student knows how to step through the program in debug mode.
5. Check that the student knows how to examine the contents of registers.
6. Check that the student knows how to examine the contents of memory at a particular location.
7. For question 1, ask the student to load a byte into the memory location 70H and show you the result of running the program.
8. For question 2, ask the student to load some integers in the range $\{0, 1, 2, \dots, 127\}$ into the memory locations from 40H to 53H and show you the result of running the program.
9. For question 2, ask the student to step through the code in the Keil debugger until a SUBB instruction is executed. Ask the student to explain the state of the PSW register, i.e. why does it have the contents it has at that point.