1. What is a Program Counter? Draw a block diagram to show the connection between Program counter, Program memory and ALU in a processor.

2. What are different memory types and name the ones that exist in the AVR microcontroller.

3. What is the total storage capacity (in terms of bits) of a memory with 2048 locations, where each location is 16 bits? How many address bits are required?
4. Explain what is this code doing:

.DEF temp=R16 ;
LDI temp, 255;
A: dec temp;
    BRNE A;

5. Write a small subroutine that waits for user to press Pind 7 if pressed then goes to another subroutine that debounces, meaning that it keeps waiting until the user stops pressing and then returns.

6. Write a subroutine delay that creates delay for about 10 cycles using NOP instruction and also near the same delay when using a counter.