Study Questions (Chapter 03 – Part 3)

1. What is the main function of the *program counter,* and how it differs from the *location counter*?
2. What is the main function of the *location counter,* and how it differs from the *program counter*?
3. What does the term *word aligned address* mean?
4. What does the term *half-word aligned address* mean?
5. Consider the following program.
   Edit lines `L1, L2, L3, L4, L5, L6,` and `L7,` by adding any combinations of data definition directives, i.e., `DCD, DCW, DCB, SPACE,` and `ALIGN`.

   Manually calculate the values of `r1, r2, r3, r4, r5, r6,` and `r7`.

   Assemble and run the program to verify your answer.

```
      AREA data_definitions, CODE, READONLY

      ENTRY
      ADR r1, L1
      ADR r2, L2
      ADR r3, L3
      ADR r4, L4
      ADR r5, L5
      ADR r6, L6
      ADR r7, L7
loop  B   loop

L1    ……..
L2    ……..
L3    ……..
L4    ……..
L5    ……..
L6    ……..
L7    ……..

      END
```

1. Program Counter points at the next instruction to be executed
2. location Counter points at the next available memory location
3. The address is 32 bits long
4. The address is 16 bits long.
5.