#1. a) Write the SPARC assembly instructions to define the following global variables in the data segment:

- char c = 0x64;
- float f = 4.20;
- double d = 3.456;

#2. What is the value (in hex) of %o1 after each set of instructions:

**a)**

set 0xB4F8B4F8, %o1
sll %o1, 12, %o1

Value in %o1 at this point is 0x___________________________________________

**b)**

set 0xB4F8B4F8, %o1
sra %o1, 20, %o1

Value in %o1 at this point is 0x___________________________________________

**c)**

set 0xB4F8B4F8, %o1
set 0x69696969, %o2
and %o1, %o2, %o1

Value in %o1 at this point is 0x___________________________________________

**d)**

set 0xB4F8B4F8, %o1
set 0x69696969, %o2
btog %o2, %o1

Value in %o1 at this point is 0x___________________________________________
#3. Write the equivalent **unoptimized** SPARC assembly language instructions to perform the following C code fragment.

C

```c
i = -99;
x = 4957;
while ( i != 17 ) {
    i = i + 49 + x;
    ++x;
}
```

SPARC assembly

```asm
/* i is mapped to %l7 */
/* x is mapped to %l3 */
```

Now optimize your answer to eliminate any delay slots:

**Optimized version of above SPARC assembly**