Q1

(1) First, convert the octal number into a decimal number: $1 \times 8^{10} + 1 \times 8^9 + 2 \times 8^8 + 9 \times 8^7 + 2 \times 8^6 + 7 \times 8^5 + 0 \times 8^5 + 6 \times 8^3 + 0 \times 8^2 + 2 \times 8^1 + 0 \times 8^0 = 1129270608$, therefore 10323646520(8) = 1129270608 (10).

(2) Second, convert the decimal number into a hexadecimal number:

$1129270608 \div 16 = 70579413 \ldots 0$

$70586581 \div 16 = 4411213 \ldots 5$

$4411213 \div 16 = 275700 \ldots 13$

$275700 \div 16 = 17231 \ldots 4$

$17231 \div 16 \ldots 1076 \ldots 15$

$1076 \div 16 = 67 \ldots 4$

$67 \div 16 = 4 \ldots 3$

$4 \div 16 = 0 \ldots 4$

Therefore 1129270608(10) = 434F4D50(16)

(3) According to the ASCII form, convert the hexadecimal number into ASCII codes:

43 → C

4F → O

4D → M

50 → P

Therefore, the resulting text message is “COMP”.

Q2

(1) The pseudocode could be:

```
set list1 = []
set list2 = []
set list3 = []
repeat
    from the first number in M, set a = value of the number
    if a is not found in list1
        append a to list1
        set b(a) = 1
        append b(a) to list2
        set c(a) = the position number of b(a) in list2
        append c(a) to list3
    else
        b(a) = b(a) + 1
        set list2[c(a)] = b(a)
until all the numbers in M are checked
if b(a) is the only element with the maximum in list2
    a is the intensity value occurring most frequently
else
    if c(a) is the element with the minimum in list3
        a is the intensity value occurring most frequently
```

(2) Input: the given matrix, M

Output: the intensity value occurring most frequently in M

Q3

From my points of view, it is a function that I act like. And the input should be the technical specifications and my ideas, while the output should be the codes that I write in the software development tool and eventually the completed business software. It is because that if I act like a procedure, I would be supposed to show no output at all. However, I am not always obtaining input and just storing them.