1) Declare the following:

   a) An unnamed enumerated type with constants `low`, `medium`, and `high` having values 0, 1, and 2, respectively.
   b) An enumerated type named `difficulty` with constants `low`, `medium`, and `high` having values 0, 1, and 2, respectively.
   c) An enumerated type named `fruit` with constants `apple`, `banana`, and `orange` having values 0, 4, and 5, respectively.
   d) A variable named `myfruit` with the type declared in c).
   e) An union named `aunion` with the following members: character `c`, integer `i`, and double-precision floating point `d`.
   f) A variable named `myunion` with the type declared in e).
   g) An unnamed union with the following members: character `c`, integer `i`, and double-precision floating point `d`, and at the same time a variable `u1` of the unnamed union type.

2) Consider the following C code snippet:

```
enum { mercury, venus=3, earth, mars } p1 = mars;
```

   a) What is the value of `mercury`?
   b) What is the value of `earth`?
   c) What is the value of `p1`?

3) Consider the following C code snippet:

```
1  union ut {
2       int i;
3       double d;
4  } u1;
5
6  u1.i = 10;
7  u1.d = 2.5;
```

   a) What is the size of the variable `u1`?
   b) What is the active member at line 6?
   c) What is the active member at line 7?
   d) Is the value of the member `i` valid after line 7?
   e) Is the value of the member `d` valid after line 7?

4) Determine whether each of the following statements is True or False:

   a) One advantage of file stream over file descriptor is that the former allows content to be formatted using format specifiers.

b) To be able to read keyboard input, a program must first open the `stdin` stream.

c) When a file is opened with mode "a", the contents of the file (if it exists) will be deleted.

d) The function `fflush()` only works on streams that are open for output.

e) The function `fscanf()` will return EOF if the end of file is reached, or errors were encountered while reading the file.

f) Whe a binary file is opened with mode "rb", the file must exist, otherwise, `fopen()` will return NULL.

g) The call `rewind(fp)` is equivalent to the call `fseek(fp, -s, SEEK_END)`, where `s` is the size of the file (in bytes).

5) Consider the following C snippet:

```
1   int i;
2   FILE *fp = fopen("input.txt", 'r');
3   fscanf(fp, "%d", &i);
4   /* Done reading from the file */
5   printf("%d", i);
```

Describe 4 issues (error and poor programming) with the code.

6) Write a C program that will open a text file named `input.txt` for reading. The program will then convert all content to their lowercase equivalent, and output these to another text file named `output.txt`.