COMP3173 25F Assignment 1

Q1. Tomas is new to C programming language. He wrote the following program. Please identify all errors and the corresponding error types in the program. (20 pt)

```
int main(){
  float a=贰拾;
  int b=3.4;
  for(int i,i<10,i++)
    int x=0;
    x++;
  return 0;
}
```

Q2. In C programming language, users are allowed to define integer constants under the following rules.

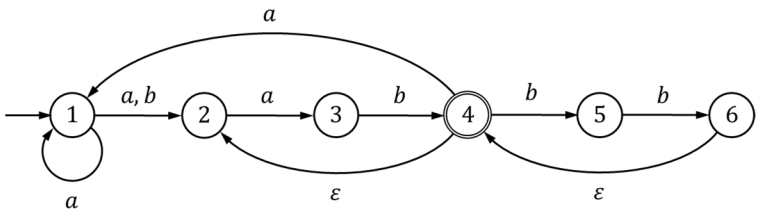
- The value is in decimal if it is a single digit from '0' to '9' or a sequence of multiple digits such that the left-most digit is not '0' and other digits are from '0' to '9'.
- The value is in hexadecimal if the first two digits are '0x' or '0X' and followed by other digits from '0' to '9' or 'A' to 'F' or 'a' to 'f'.
- The value is in octal if the first digit is '0' and other digits are from '0' to '7'.

Write **ONE** regular expression for integer constants. (10 pt)

Q3. The regular expression for binary floating point constant is defined as $(\mathbf{0}|\mathbf{1})^*.(\mathbf{0}|\mathbf{1})^*\mathbf{1}$ (Note that '.' is the decimal point) Please **strictly** follow the recursive construction on the slides to design an NFA to recognize binary floating points. (20 pt)

Q4. Design a DFA for the binary floating points in Q3. (20 pt)

Q5. Given the following NFA. (15 pt for each)



a) Convert the NFA to an equivalent DFA.
b) Minimize the DFA in part a.