# Homework 1

学号 姓名

1. Give DFA's accepting the languages over the alphabet $\{0, 1\}$ (notice : give diagram notation of DFA)

   a) The set of strings that either begin or end with 01.

   b) The set of strings such that the number of 0's is divisible by three, and the number of 1's is divisible by two.

   c) The set of all strings such that each block of three consecutive symbols contains at least two 0's.

2. Give nondeterministic finite automata to accept the following language. Try to take advantage of nondeterminism as much as possible.

   The set of strings over alphabet $\{0, 1, ..., 9\}$ such that the final digit has appeared before.

3. Convert the following NFA to a DFA by subset construction.(notice: give diagram notation of DFA, and label the states by subsets)

| | 0 | 1 |
|---|---|---|
| $\rightarrow p$ | $\{p, q\}$ | $\{p\}$ |
| $q$ | $\{r\}$ | $\{r\}$ |
| $r$ | $\{s\}$ | $\emptyset$ |
| $*s$ | $\{s\}$ | $\{s\}$ |