There are two ATM components: ATM-1 and ATM-2.

The **ATM-1** component supports the following operations:

create()	// ATM is created
card (int x, string y)	// ATM card is inserted where *x* is a balance and *y* is a pin #
pin (string x)	// provides pin #
deposit (int d);	// deposit amount *d*
withdraw (int w);	// withdraw amount *w*
balance ();	// display the current balance
lock(string x)	// lock the ATM, where x is a pin #
unlock(string x)	// unlock the ATM, where x is pin #
exit()	// exit from the ATM

The **ATM-2** component supports the following operations:

create()	// ATM is created
CARD (float x, int y)	// ATM card is inserted where *x* is a balance and *y* is a pin #
PIN (int x)	// provides pin #
DEPOSIT (float d);	// deposit amount *d*
WITHDRAW (float w);	// withdraw amount *w*
BALANCE ();	// display the current balance
EXIT()	// exit from the ATM

These ATM components are state-based components and support three types of transactions: withdrawal, deposit, and balance inquiry. Before any transaction can be performed, operation *card*(*x*, *y*) (or *CARD*(*x*, *y*)) must be issued, where *x* is an initial balance in the account and *y* is a pin used to get permission to perform transactions. Before any transaction can be performed, operation *pin(x)* (or *PIN(x)*) must be issued. The *pin(x)* (or *PIN(x)*) operation must contain the valid pin # that must be the same as the pin # provided in *card*(*x*, *y*) (or *CARD*(*x*, *y*)) operation. There is a limit on the number of attempts with an invalid pin. The account can be overdrawn (below minimum balance), but a penalty may apply. If the balance is below the minimum balance then the withdrawal transaction cannot be performed. In addition, ATM-1 component can be locked by issuing *lock(x)* operation, where *x* is a pin #. The ATM-1 can be unlocked by *unlock(x)* operation. The detailed behavior of ATM components is specified using EFSM. The EFSM of Figure 1 shows the detail behavior of ATM-1, and the EFSM of Figure 2 shows the detailed behavior of ATM-2. Notice that there are several differences between ATM components.

Aspects that vary between these ATM components:

a. Maximum number of times incorrect pin can be entered
b. Minimum balance
c. Display menu(s)
d. Messages, e.g., error messages, etc.
e. Penalties
f. Operation names and signatures
g. Data types
h. etc.

The goal is to design an executable meta-model, referred to as **MDA-EFSM**, for all ATM components. The MDA-EFSM should capture the "generic behavior" of these two ATM components and should be de-coupled from data and implementation details. Notice that there should be **ONLY** one MDA-EFSM for these two ATM components.