Sample Problems for Testing

- **For "Program" Level Testing:**
  - **Triangle**
  - **Next Date**
  - **Sales Commission**
- **For "System" Level Testing:**
  - **SATM system**
  - **Currency conversion**
  - **Windshield Wiper**

These 6 problems will be used throughout the remainder of the course as examples for different testing techniques

Difference between Unit testing and System testing

Sl.no	Unit testing	System testing
1.Defnition	Unit testing is a testing method in which tester tests single module at a time and not integrated version of the application.	System testing each module treated as separate target for testing and these modules are integrated one by one after completion of testing process.
2.Approach	In case of Unit testing Single module testing approach is taken in practice.	It comprises of Bottom up approach testing and top-down testing with all modules in integrated mode.
3.Defects	So Defects get easily identified and locked as per module.	Not easily identified, modules are integrated after testing so defects are easily identified.
4.Abbreviation	White box testing	Black box testing
5.Parallel Testing	Not Possible	It's possible, multiple modules tested in parallel.
6.Cost Effective	Less cost, Less number of resources are required for testing.	Higher cost, More Number of resources are required.
7.Performance	High As a compared to System testing.	System testing has Lower performance as compared to Unit testing.

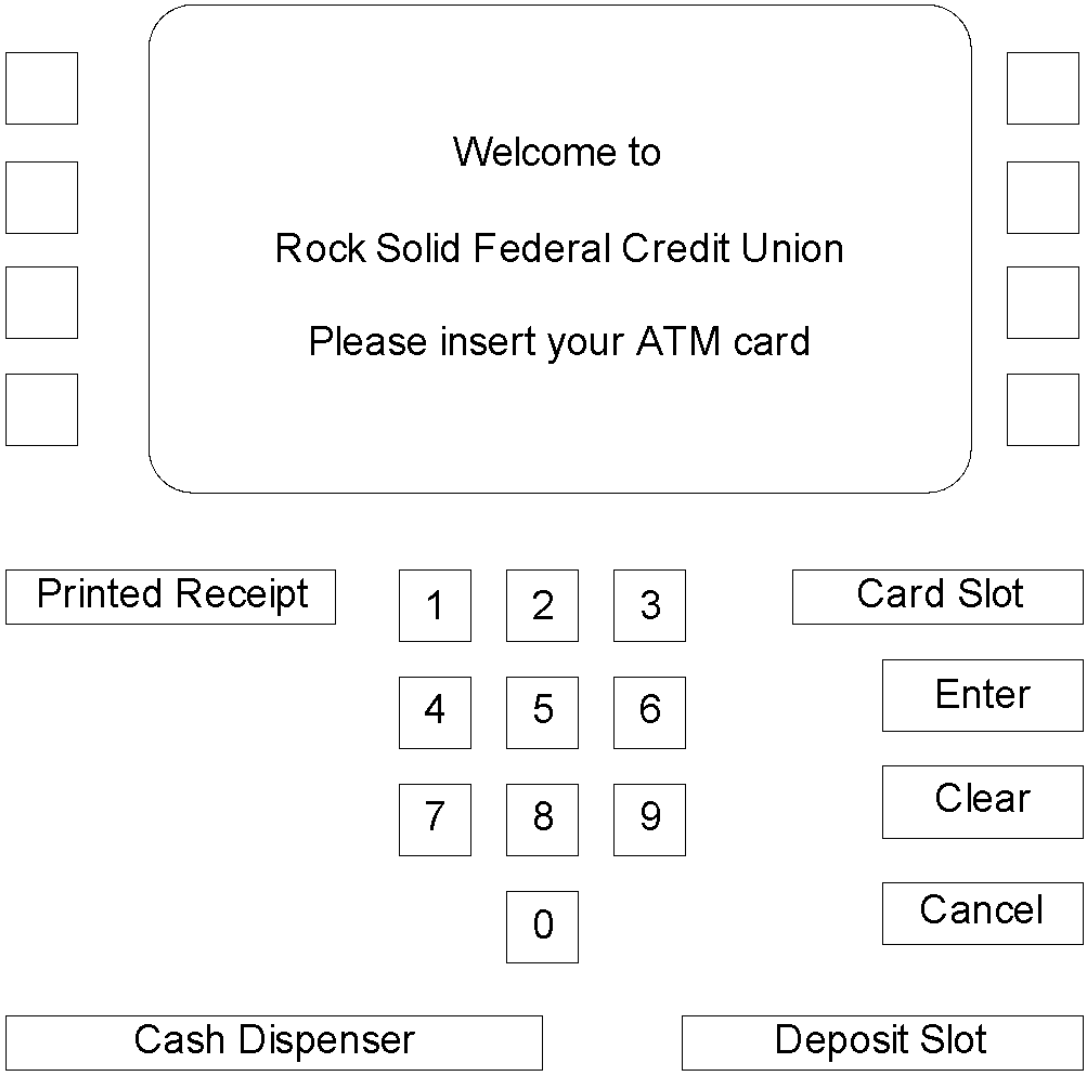
4. SATM System Problem

- **Problem (Requirements) Statement:**

  - ***Develop part (a component) of an automatic teller system that:***

    - ***Displays a "welcome screen" with a simple instruction to insert ATM card***
    - ***Validates the ATM card. If invalid keeps it (with a message); otherwise goes on***
    - ***Asks for and validates a personal id number (only up to 3 times)***
    - ***If valid, three "activity" options are presented:***
      - ***Check the account balance***
      - ***Withdraw from the account***
      - ***Deposit into the account***
    - ***Once the option is selected, the customer is presented with and asked to choose between a checking or a savings account***
    - ***For each of these 3 optional activities the customer account file is also updated with***
      - ***Date of ATM access and***
      - ***Increment the number of times this account is accessed through ATM***

4. SATM System Problem



4. SATM System Problem (cont.)

– *Requirements (cont.)*

- *If account balance is requested then a new balance is printed and the customer is given a choice for more activities.*
- *For both withdrawal and deposit options, the customer is asked to key in the amount*
- *For withdrawal, the minimum increment is $10. The customer account will be updated, and the customer will be asked to take the cash from the dispenser. In the event there is insufficient funds, the customer is asked to re-key an amount*
- *For deposits, if the ATM terminal deposit is working (envelop exists and slot moves), then the customer is asked to place the deposit in an envelop and deposit through the ATM. Otherwise, the customer is told of the problem and given a choice of other options.*
- *When customer activities are complete, a new balance is printed on the receipt and a choice for more activities is given. If the customer chooses more activity, he is returned to the 3 choices of activities again.*
- *If the customer has no more activity then a message for customer to take both the receipt and the ATM card and the system ends.*

This testing would be closer to a component or system test, after each unit test is completed. How would divide the component into units for unit testing?

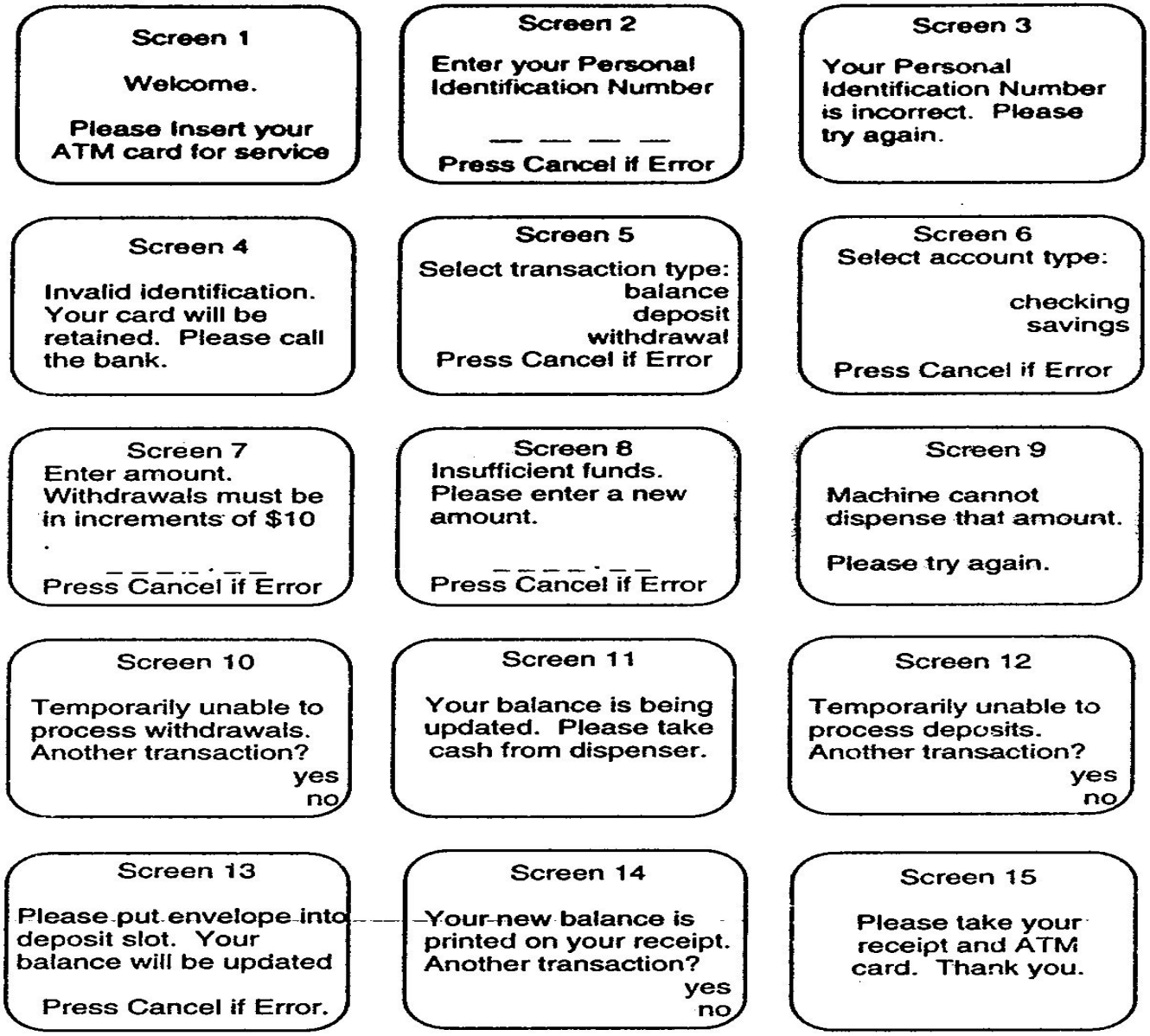


Figure 2.4 SATM screens.

Test Cases and Observation's for ATM

A)1.Verify if the card reader is working correctly, Screen should ask you to insert the pin after insert a valid card.

2.Cash Dispenser is Working Properly.

3.Recipt Printer is working properly.

3.Screen Buttons.

4.Visibility,Font of the text, Each number on the keypad.

5.Text color, language selection option.

6.Logout time.

B)Verifying the messages

1.PIN is wrong verify the message

2.No cash in the ATM.

3.After transaction.

C)Cash Withdrawal

1.Inserting Some valid amount and check.

2.User can only perform one transaction per PIN insert.

Test Cases and Observation's for ATM

D)Negative text messages

1. Verify the function by giving wrong password.

2. Card reader functionality by inserting expired card.

3. Verify Withdrawal operation by entering an amount greater than per day limit.

4. Verify Withdrawal operation by entering an amount greater than available balance.

5. Currency Conversion Subsystem

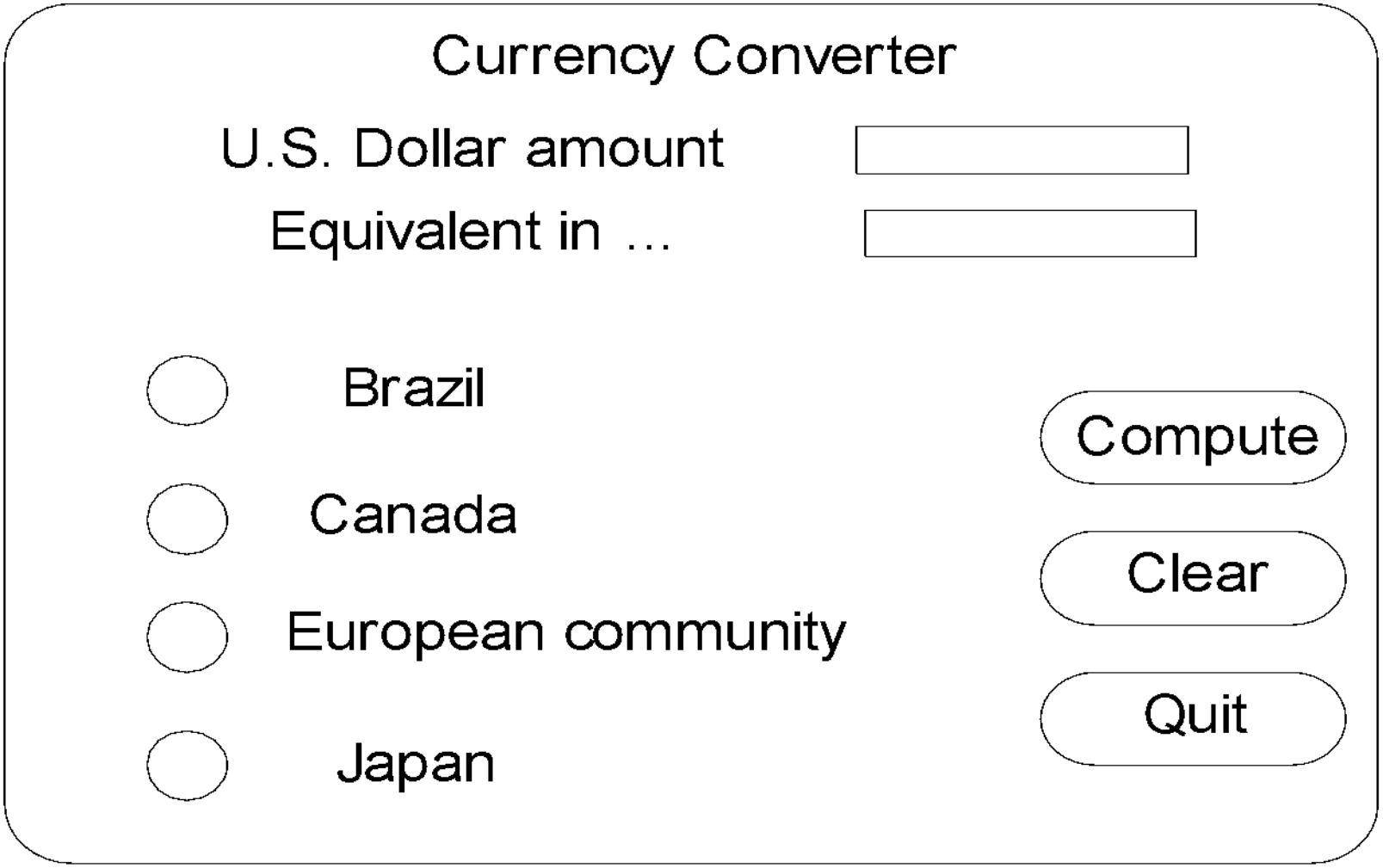
- **Problem (Requirements) Statement:**
  - ***Develop a GUI based sub-system that***

    - ***will accept US currency and convert it to:***
      - ***Brazilian currency***
      - ***Canadian currency***
      - ***European community currency***
      - ***Japanese currency***

    - ***use the exchange rate within the last 12 hours.***
    - ***Also allow the "reverse currency" computation***

Look at this requirement statement and identify areas of potential problem if you were writing the program - - - anything more if you were testing this?

The currency converter



6. Saturn Windshield Wiper Controller

- **Problem (Requirements) Statement:**
  - ***Write me an "embedded" program that***
    - ***Controls the 4 speed settings of a windshield wiper:***
      - ***Off***
      - ***Intermittent***
      - ***Low***
      - ***High***
    - ***For "off", the windshield wiper does not move***
    - ***For Intermittent setting, there are 3 "dial" sub-settings:***
      - ***1 : wiper wipes 4 times per minute***
      - ***2: wiper wipes 6 times per minute***
      - ***3: wiper wipes 12 times per minute***
    - ***For Low, the wiper wipes 30 times per minute***
    - ***For High, the wiper wipes 60 times per minutes***

OFF -> Wiper does not move

As a tester what needs to be considered?
- if wiper is not moving, then ?

Look at this requirement statement and identify areas of potential problem if you were writing the program - - - anything more if you were testing this?

6. Saturn Windshield Wiper Controller

c1. Lever	OFF	INT	INT	INT	LOW	HIGH
c2. Dial	n/a	1	2	3	n/a	n/a
a1. Wiper speed is…	0	4	6	12	30	60