

COMP 4081
Exam 2
Fall 2014

Name: Solutions _____,
Last name First name

Rules:

- No potty breaks.
- Turn off cell phones/devices.
- Closed book, closed note, closed neighbor.
- WEIRD! Do not write on the backs of pages. If you need more pages, ask me for some.

Reminders:

- Verify that you have all pages.
- Don't forget to write your name.
- Read each question carefully.
- Don't forget to answer every question.

1. [5pts] Fill in the 5 types of requirement that FURPS stands for.

Functional

Usability

Reliability

Performance

Supportability

2. [4pts] Consider the Seedpod system that we used in class. Reverse engineer one functional requirement for the system and write a user story for that requirement. Apply the templates and guidelines from lecture to ensure the US is high quality. You may omit the estimate and priority.

Many possible answers

- Title should be <verb> <noun>

- Description should follow template: As a <who>, I want <what> <why>.

- INVEST and other guidelines should be followed

3. [4pts] What two things are wrong with the following US description.

The interface will be implemented using jQuery.

1. The US mentions specific implementation technologies (jQuery).

2. The US uses technical jargon (jQuery) with which the customer may not be familiar.

3. This US would be hard to estimate/plan ("S" in INVEST)

4. [3pts] T or F? The larger the estimate, the more likely it is to be accurate.

a. True

b. False

5. [3pts] T or F? Planning poker uses the "wisdom of the single biggest expert" to estimate how long it will take to implement user stories.

a. True

b. False

6. [7pts] Describe the process of iteration planning that we used in this course by writing 7 sentences. Create each sentence by filling in 3 blanks with the following words/phrases. Fill in *all* blanks.
- Blank #1: developer, customer
 - Blank #2: estimates, selects (for iteration), assigns (to developer), creates, prioritizes
 - Blank #3: tasks, user stories

developer (customer) creates user stories .

developer estimates user stories .

customer prioritizes user stories .

developer selects user stories .

developer creates tasks .

developer estimates tasks .

developer assigns tasks .

7. [4pts] Authentication is concerned with e, whereas authorization is concerned with b. (Fill in the blanks.)

- flagging the user if he/she misbehaves
- restricting what operations/data the user can access
- determining if the user is a hacker
- logging access violations
- determining who the user is

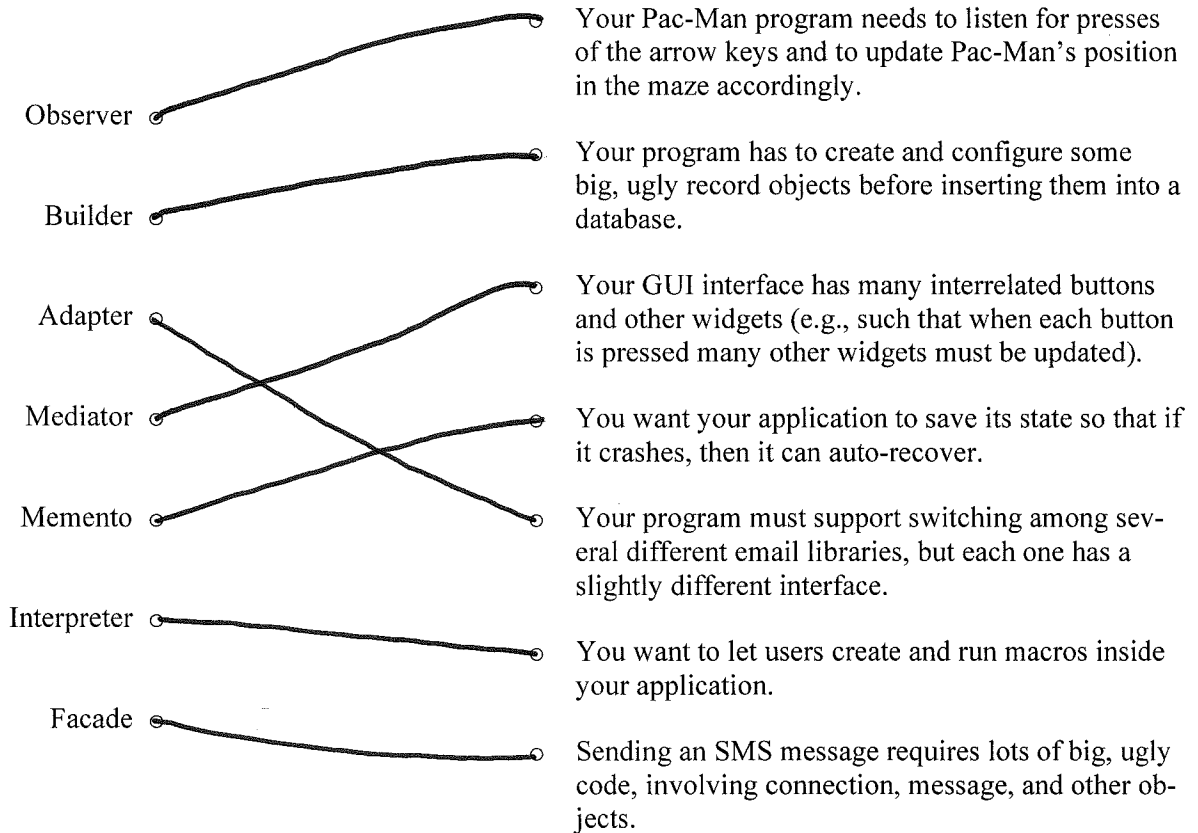
8. [3pts] How do you prevent packet-sniffing exploits?

- Escape packet text
- Scan for viruses
- Encrypt network communication with SSL
- Packet plugs
- None of the above

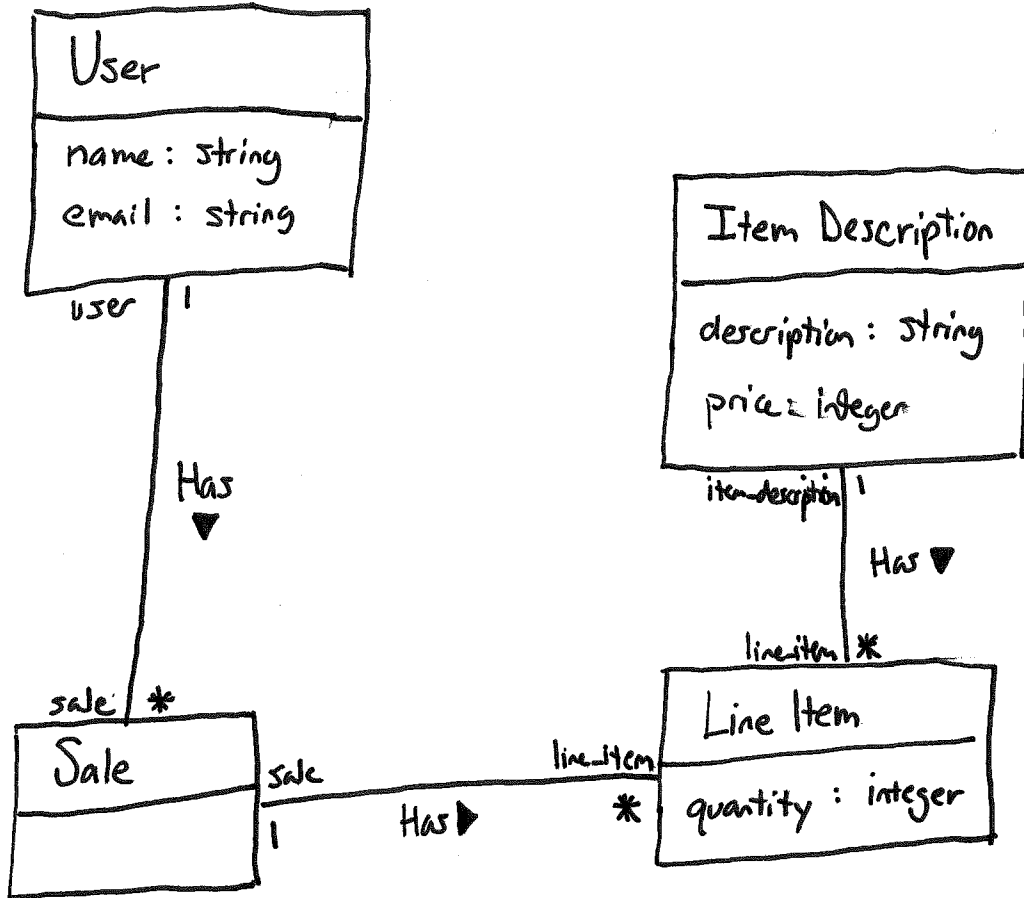
9. [3pts] Imagine a social networking web app (like Twitter) that allows users to post short blurbs of text. Which type of exploit might be carried out by posting text that contains malicious code?

- a. Cross-site scripting
- b. SQL injection
- c. Packet sniffing
- d. a and b
- e. a, b, and c

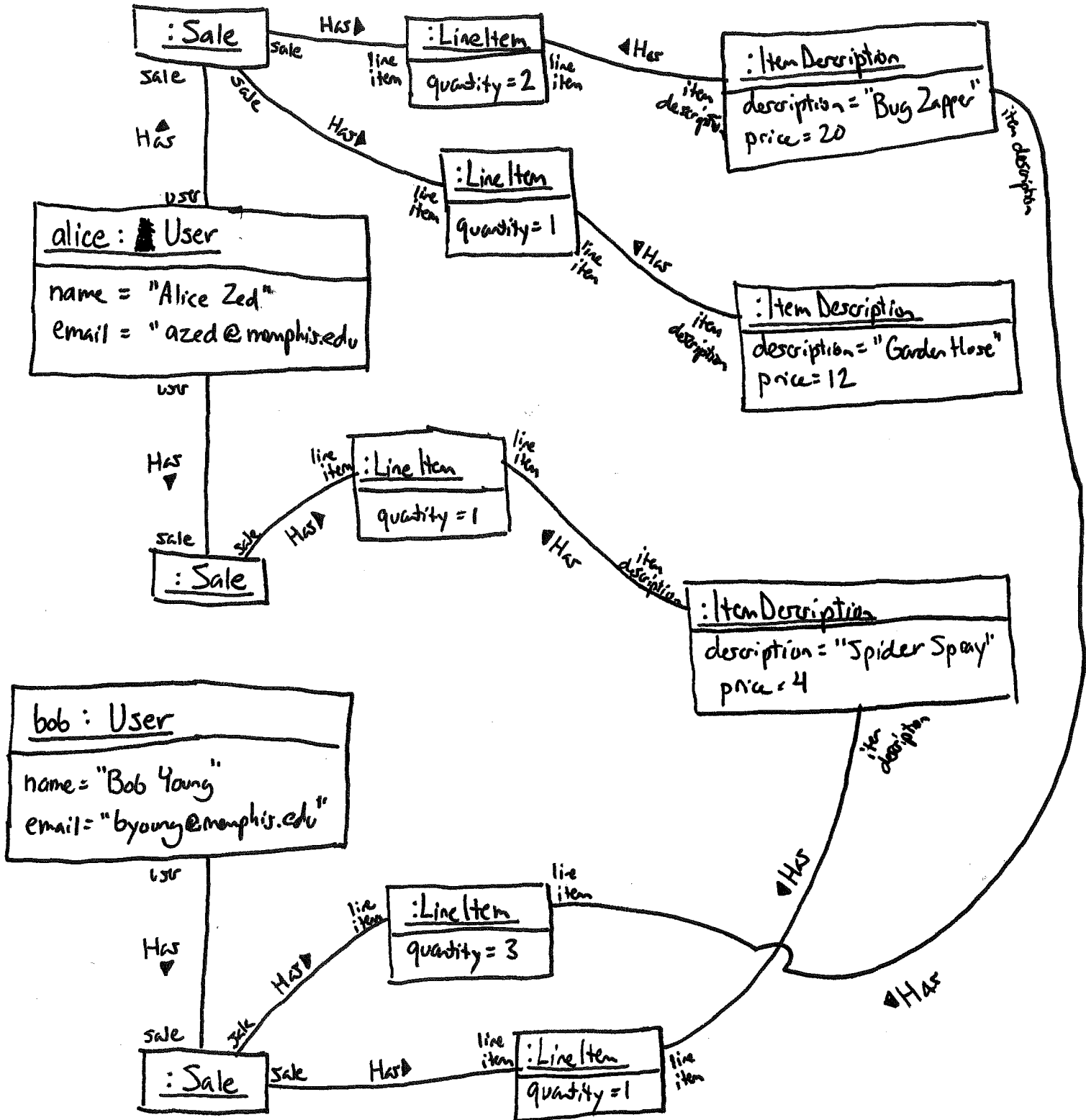
10. [7pts] Match the design pattern to the situation to which you should apply it.



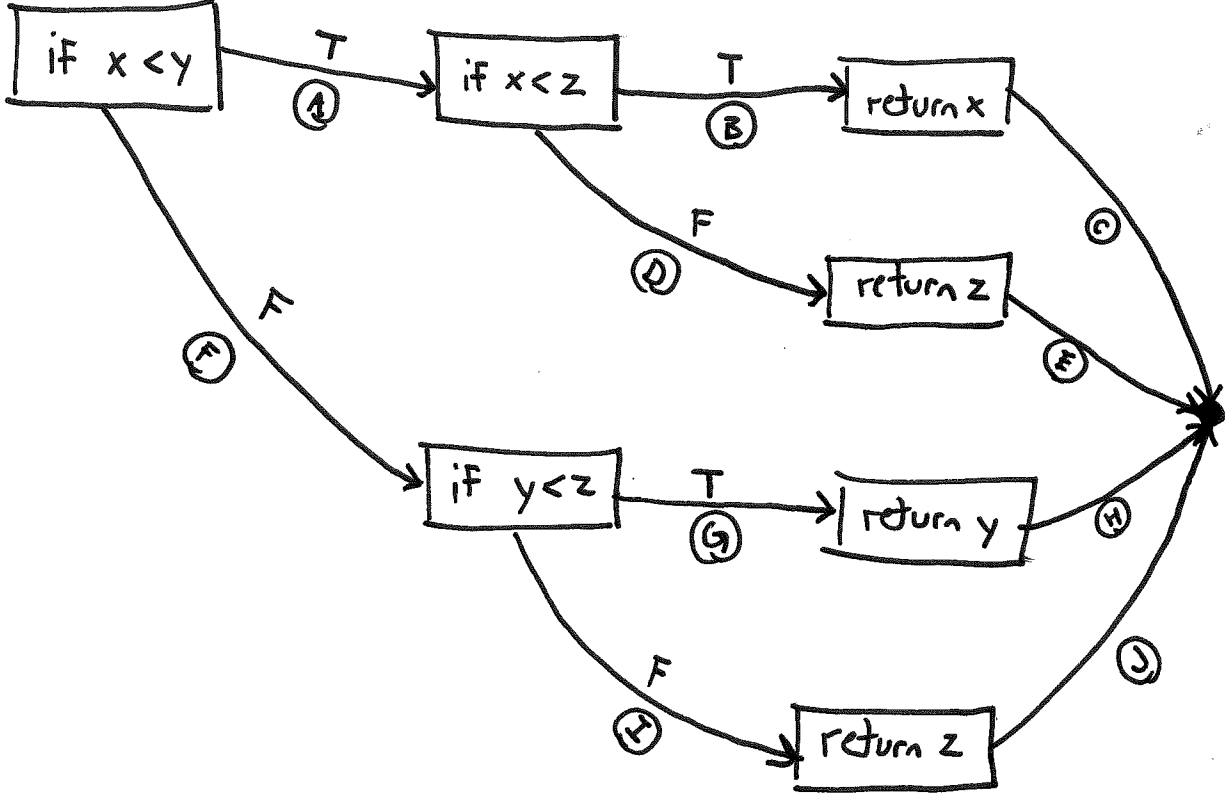
11. [11pts] Create a UML class diagram representing the point-of-sale model classes in Figure 1. Be sure to label all associations and association ends, and include all multiplicities. Don't include "id" attributes (objects have identity by default).



12. [11pts] Consider the following execution of a point-of-sale system with the model in Figure 1. Two users register: Alice Zed (azed@memphis.edu) and Bob Young (byoung@memphis.edu). Alice purchases the following things: 2 Bug Zappers (\$20 each) and 1 Garden Hose (\$12 each). Bob purchases the following things: 3 Bug Zappers and 1 Spider Spray (\$4 each). Later, Alice makes another purchase: 1 Spider Spray. Create an object diagram that depicts the model objects after this execution.



13. [10pts] Draw a control-flow graph for the function in Figure 2. Label each edge in the graph with an uppercase letter.



14. [7pts] Fill in the table below with a test suite that provides path coverage of the code from the previous question. In the covers column, list the relevant labeled edges in your CFG that each test case covers. Some cells in the table may be left blank.

Input			Expected Output	Covers
x	y	z		
1	2	2	1	A, B, C
2	3	1	1	A, D, E
2	1	2	1	F, G, H
3	2	1	1	F, I, J

15. [3pts] In system testing, should the software developers who wrote the code perform the testing? Explain your answer.

No, they should not because

(1) the developers cannot see the system the same

way the user would, and

(2) the developers have a disincentive to find bugs

(it's their baby, and finding bugs creates more work

for them).

```
1 # id      :integer      not null, primary key
2 # name    :string
3 # email   :string
4 class User < ActiveRecord::Base
5   has_many :sales
6 end
```

```
1 # id      :integer      not null, primary key
2 class Sale < ActiveRecord::Base
3   belongs_to :user
4   has_many :line_items
5 end
```

```
1 # id      :integer      not null, primary key
2 # quantity :integer
3 class LineItem < ActiveRecord::Base
4   belongs_to :sale
5   belongs_to :item_description
6 end
```

```
1 # id      :integer      not null, primary key
2 # description :string
3 # price    :integer
4 class ItemDescription < ActiveRecord::Base
5   has_many :line_items
6 end
```

Figure 1. Model classes for a point-of-sale system.

```
def min_of_three(x, y, z)
  if x < y then
    if x < z then
      return x
    else
      return z
    end
  else
    if y < z then
      return y
    else
      return z
    end
  end
end
```

Figure 2. Sample function.