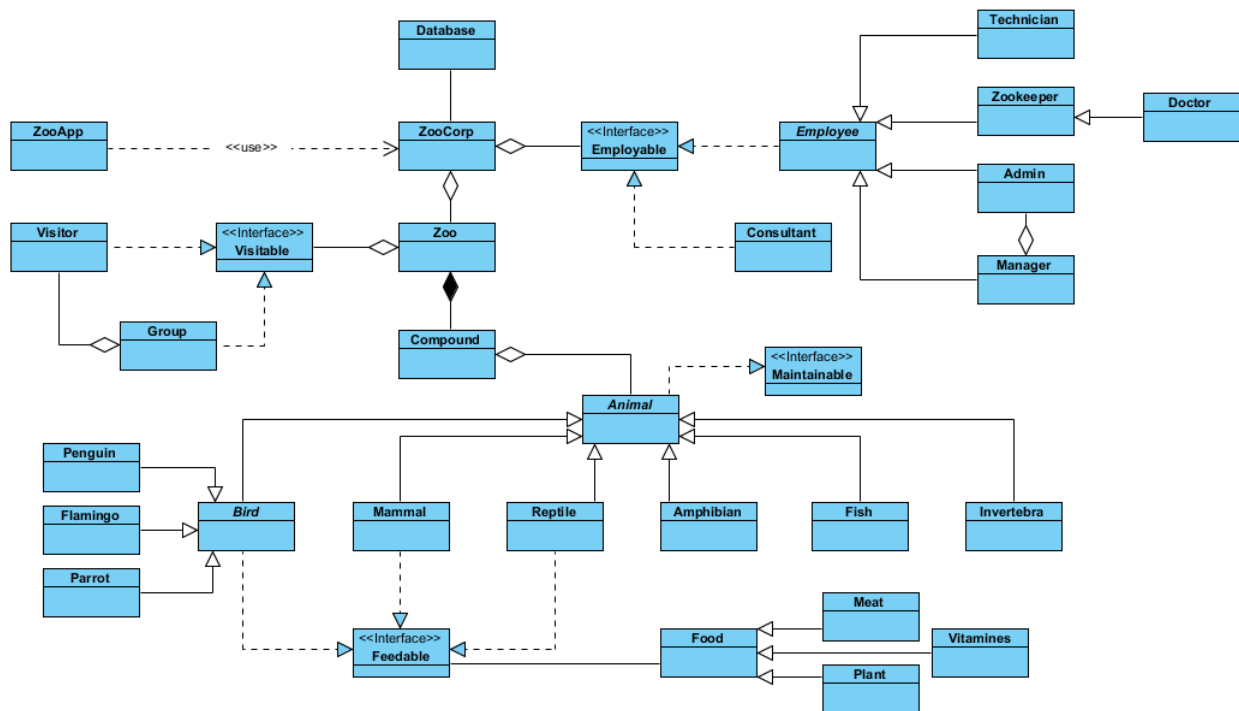


COMP2013-DMS Practice Test Questions

When we talk about the **ZooProject** in the questions we always relate to the project presented in the following diagram:



Question 1. Developing Maintainable Software:

- Briefly explain the relationship between writing maintainable software and software maintenance. [5 marks]
- Illustrate your answer from (a) with an example that relates to the **ZooProject** [5 marks]
- Provide two practical examples of how you could add "robustness" to the **ZooProject** code, leading to software that is easy to maintain and extend, and justify why your example would make the code maintainable. [7 marks each]

[overall 24 marks]

[Allowed maximum length of your answer: 250 words]

Question 2. Object-Oriented Design: Given the code snippet below, which type of relationship is implemented?

[overall 3 marks]

```
1 package com.exam;
2
3 import java.util.ArrayList;
4
5 public class Sentence {
6     private final ArrayList<Word> words=new ArrayList<>();
7
8     public void add(Word word){
9         words.add(word);
10    }
11
12    public void wordCount(){
13        System.out.println("Number of words: "+words.size());
14    }
15 }
```

Dependency

Aggregation

Composition

Association

No Relationship

All a-d relationships

Question 3. Object-Oriented Design:

- Explain the "Single Responsibility Principle" in your own words. [5 marks]
- Provide an example related to the **ZooProject** to show how it could be used. [5 marks]

[overall 10 marks]

Question 4. Object-Oriented Design: Given the code snippet below, which type of relationship is implemented?

[overall 3 marks]

```
1 package com.exam;
2
3 public class Worker {
4     private int numJobs;
5
6     public void useMachine(Machine machine){
7         System.out.println("Using machine: "+machine);
8         numJobs++;
9     }
10
11     public void jobCount(){
12         System.out.println("Number of jobs: "+numJobs);
13     }
14 }
```

1. Dependency
2. Aggregation
3. Composition
4. Association
5. No relationship
6. All relationships a-d

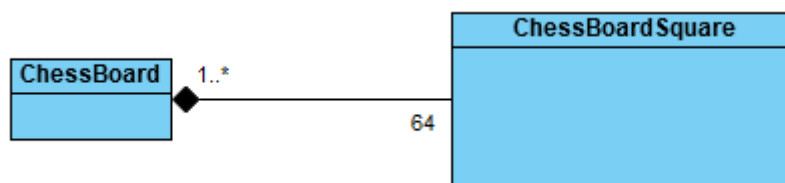
Question 5. Object-Oriented Design: You are in a team of developers who have just started to work on altering the **ZooProject**. Luckily, the software has been written using good object-oriented coding practice and the original programmers have used a lot of encapsulation in the system. Provide a code example in relation to the **ZooProject** that would demonstrate encapsulation [4 marks]. Then provide 2 reasons with short explanations why using encapsulation in software development is a helpful approach [3 marks each]

[overall 10 marks]

Question 6. Coding Conventions: Bob's Concise Coding Conventions are designed to improve: _____. (fill in the blank)

[overall 2 marks]

Question 7. UML: A chess board consists of 64 chessboard squares. Given the UML diagram below, answer the following:



[overall 5 marks]

What kind of relationship is presented here? [2 marks]

There is a mistake in the drawing. What is wrong and why? [3 marks]

Question 8. UML:

When maintaining a system you may be given some accompanying documentation. One such document is a UML Use Case Diagram.

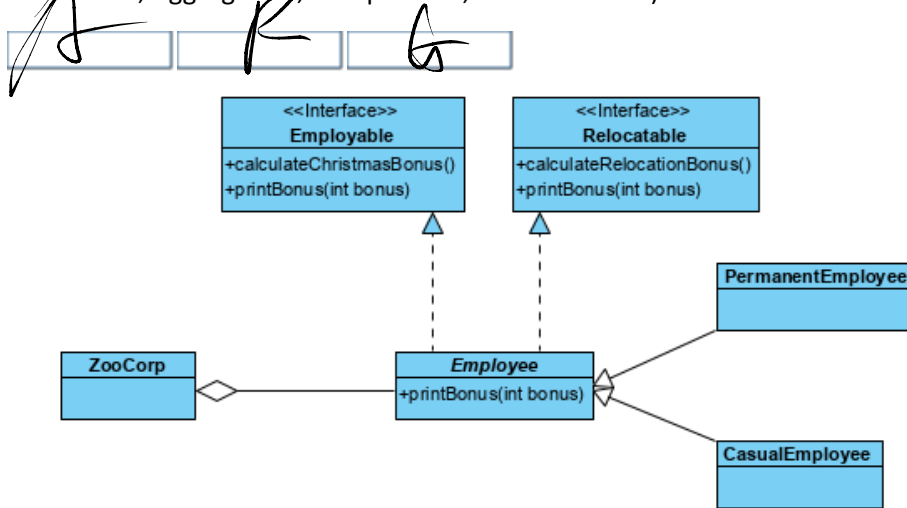
- a) What is the purpose of a Use Case Diagram? [3 marks]
- b) In Use Case diagrams, what do Actors represent? [3 marks]
- c) State TWO differences between a Use Case Diagram and an Activity Diagram [2 marks each]

answers have interface

[10 marks]

Question 9. UML:

The following is a section of a class diagram. Label the three indicated relationships (options are: Realisation; Aggregation; Composition; Generalisation).



[6 marks]

Question 10: Git Usage

Look at the following screen which is of a local text file after pulling down changes from the remote repository.

```
1 <<<<<<< HEAD
2 Andrew French
3 Bob Smith
4 =====
5 Andrew French
6 Charlie Brown
7 >>>>>>> 16903c90448173db42eebc937fc2126891b1d98a
8
```

Fill in the blanks below in the text about the situation that is shown.

Blank 1.

- a) an edit collision
- b) a HEAD error
- c) a 3-way commit
- d) a push -force

Blank 2.

- a) you need to edit and save the file as you wish it to appear
- b) you need to delete all the text between the <<< >>> markers
- c) you need to edit and increment the commit number at the end
- d) Git can automatically perform a 3-way merge

Blank 3.

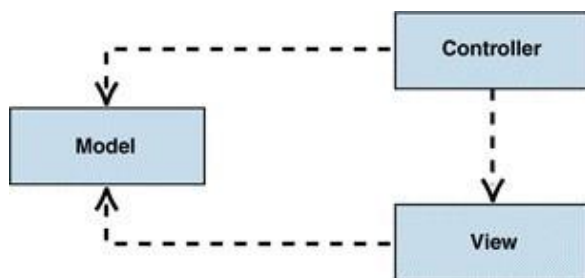
- a) ~~add commit push~~
- b) ~~commit push--force merge~~
- c) commit add merge
- d) pull merge commit
- e)

A git pull command produced the text above in your version-controlled text file. This is caused by [Blank 1]. To fix this, [Blank 2]. Then you must run the following three commands: [Blank 3].

[6 marks]

Question 11: Design Patterns

Describe one advantage of using this pattern when building a GUI:



[2 marks]

Question 12: Software Maintenance

Which TWO of the following tasks fall under software maintenance?

- a) Fixing existing coding errors
- b) Developing a user survey
- c) Adding additional requirements to a code base
- d) Increasing a user base

[2 marks]

Question 13: Object-Oriented Principles

Look at the code snippet below. Which type of relationship is implemented here?

```
2 public class A {  
3  
4     private B b;  
5  
6     public A() {  
7         this.b = new B();  
8     }  
9 }
```

- a) Dependency
- b) Aggregation
- c) Composition
- d) Association
- e) No relationship present

[3 marks]

Question 14: GUI Development

Examine the following code:

```
<children>  
  <CheckBox layoutX="39.8" layoutY="34.8" mnemonicParsing="false" text="CheckBox" />  
</children>
```

What type of code is this? What graphical elements does it produce and when would it be used?

[3 marks]