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Review

Jeopardy Game

- Instructions:
  - clue is stated
  - raise your hand
  - you state the *question* (in that form)
  - not really final exam questions
  - but an interesting, “competitive” review of software engineering concepts and terms

OOAD

- Clue:
  - An object-oriented programming language, invented by James Gosling.
- Question:
  - What is Java?

OOAD

- Clue:
  - A visual design notation, that's "unified".
- Question:
  - What is UML?

Process

- Clue:
  - Making sure you develop the system right.
- Question:
  - What is verification?

Process

- Clue:
  - Making sure you develop the right system.
- Question:
  - What is validation?

Process

- Clue:
  - Three approaches of software prototyping.
- Question:
  - What are throwaway, incremental, evolutionary?

Process

- Clue:
  - The system is delivered in a series of releases or builds.
- Question:
  - What is staged delivery?

Process

- Clue:
  - In Extreme Programming, code should conform to these rules.
- Question:
  - What are coding conventions?

Process

- Clue:
  - A practice where production code is written with two programmers actively at one machine.
- Question:
  - What is pair programming?

OOAD

- Clue:
  - Simplifying to its essentials the description of a real-world entity or concept.
- Question:
  - What is abstraction?

13

OOAD

- Clue:
  - Bundling data with access functions, in a way that distinguishes “what” from “how”.
- Question:
  - What is encapsulation?

14

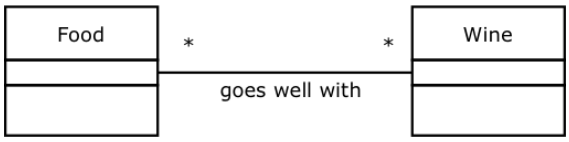
OOAD

- Clue:
  - Revealing assumptions through interfaces and hiding changeable internal details.
- Question:
  - What is information hiding?

15

OOAD

- Clue:
  - “Some” relationship between parts.

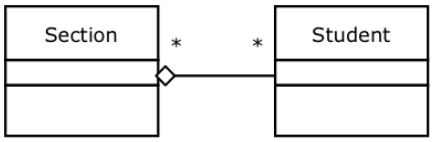


- Question:
  - What is an association?

16

OOAD

- Clue:
  - A weak “has-a” relationship.

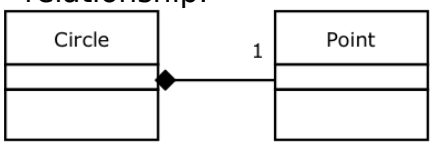


- Question:
  - What is an aggregation?

17

OOAD

- Clue:
  - Contained instances are exclusive to the container in this kind of UML relationship.



- Question:
  - What is a composition?

18

OOAD

- Clue:
  - Looking for conceptual commonalities in abstractions.

- Question:
  - What is generalization?

19

OOAD

- Clue:
  - In Java, this can be considered a “contract”, specifying a capability that implementing classes must provide.

- Question:
  - What is an interface?

20

OOAD

- Clue:
  - If this test fails, inheritance is likely not appropriate.

- Question:
  - What is the is-a test?

21

OOAD

- Clue:
  - A candidate subclass should be substitutable anywhere a reference to a superclass object is used, according to this principle.
- Question:
  - What is the Liskov substitution principle?

22

OOAD

- Clue:
  - Treating different objects in a uniform manner in a common algorithm.
- Question:
  - What is polymorphism?

23

OOAD

- Clue:
  - This kind of class cannot be instantiated.
- Question:
  - What is an abstract class?

24

OOAD

- Clue:
  - The method to run is selected at run time, depending on the type of the receiving object.
- Question:
  - What is dynamic binding?

25

OOAD

- Clue:
  - This widening type of cast is safe due to the principle of substitutability.
- Question:
  - What is an upcast?

26

OOAD

- Clue:
  - Using index cards to assist object-oriented analysis.
- Question:
  - What is CRC design?

27

OOAD

- Clue:
  - One should reduce this between classes.
- Question:
  - What is coupling?

28

OOAD

- Clue:
  - Time flows downward in this UML diagram to express behavior between objects.
- Question:
  - What is a UML sequence diagram?

29

OOAD

- Clue:
  - Each object in a UML sequence diagram plays this in a group of collaborating objects.
- Question:
  - What is a role?

30

OOAD

- Clue:
  - In Java, a nested class without a name.
- Question:
  - What is an anonymous inner class?

31

User Interface Design

- Clue:
  - Events in Swing are handled by these objects.
- Question:
  - What are listeners?

32

User Interface Design

- Clue:
  - A design to maintain the consistency of the views of some data within an interactive application.
- Question:
  - What is MVC (model-view-controller)?

User Interface Design

- Clue:
  - In Java, this interface is used with the Observable superclass.
- Question:
  - What is Observer?

User Interface Design

- Clue:
  - A set of cooperating classes that forms a reusable design for software in a particular domain.
- Question:
  - What is a framework?

User Interface

- Clue:
  - According to Scott Adams, engineers, scientists, and programmers are not representative of these people.
- Question:
  - What are normal people?

User Interface

- Clue:
  - Objects of interest in a graphical user interface should be visible, to exploit this cognitive ability.
- Question:
  - What is recognition?

37

User Interface Design

- Clue:
  - These are familiar analogies to support learning in user interfaces.
- Question:
  - What are interface metaphors?

38

User Interface

- Clue:
  - This kind of design uses layout and color to help organize and communicate information economically to users.
- Question:
  - What is graphic design?

39

User Interface

- Clue:
  - Because of this, color should not be the only way to distinguish visual elements.
- Question:
  - What is color blindness?

40

Requirements

- Clue:
  - They may not know what is possible, or be able to express their needs.
- Question:
  - Who are users?

41

Requirements

- Clue:
  - Required qualities, such as those -ibilities.
- Question:
  - What are non-functional requirements?

42

Requirements

- Clue:
  - Requirements should be this, so tests can be designed to show the system fulfills them.
- Question:
  - What is verifiable?

43

Requirements

- Clue:
  - A tendency for developers to focus on an increasingly expert group of customers, and excluding a potential market.
- Question:
  - What is the innovator's dilemma?

44

Requirements

- Clue:
  - This captures the goal, conditions, and steps of a coherent interaction between the users and the system.
- Question:
  - What is a use case?

45

Requirements

- Clue:
  - Different types of users or roles in use cases.

- Question:
  - What are actors?

46

Requirements

- Clue:
  - A way to specify a need often written in the form: as a «user role», I want «goal».

- Question:
  - What is a user story?

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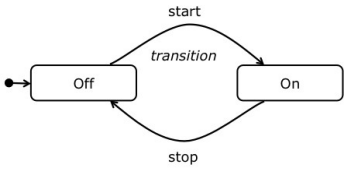
Requirements

- Clue:
  - A UML diagram used to model the behavior of an object in response to external events



- Question:
  - What is a UML state diagram?

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Testing

- Clue:
  - This leads to faults in work products, and may cause failures in running software.

- Question:
  - What is human error?

49

Testing

- Clue:
  - This kind of testing is to prevent previous problems from reoccurring.
- Question:
  - What is regression testing?

50

Testing

- Clue:
  - The correct way to test a theory is to seek this.
- Question:
  - What is to refute it?

51

Testing

- Clue:
  - Use this technique to separate out dependency resolution from the constituent classes and enhance testability.
- Question:
  - What is dependency injection?

52

Testing

- Clue:
  - A kind of testing object that mimics a real object but typically with canned data.
- Question:
  - What is a mock object?

53

Testing

- Clue:
  - A way of development where tests are generally written before the code.
- Question:
  - What is test-driven development?

54

Testing

- Clue:
  - A commonly used Java framework for writing unit tests.
- Question:
  - What is JUnit?

55

- Clue:
  - A practical, proven solution to a recurring design problem.
- Question:
  - What is a design pattern?

56

Design Patterns

- Clue:
  - This design pattern ensures a class only has one instance, and provides a global point of access to it.
- Question:
  - What is the singleton pattern?

57

Design Patterns

- Clue:
  - This design pattern composes individual objects to form a tree structure, and treats individual and composed objects uniformly.
- Question:
  - What is the composite pattern?

58

Design Patterns

- Clue:
  - This design pattern encapsulates a request as an object, so you can later undo/redo the request.
- Question:
  - What is the command pattern?

59

Design Patterns

- Clue:
  - This design pattern defines the skeleton of an algorithm, deferring some steps to subclasses.
- Question:
  - What is the template method pattern?

60

Design Patterns

- Clue:
  - An object whose main responsibility is to make other objects.
- Question:
  - What is a factory?

61

Design Patterns

- Clue:
  - This design pattern defines an interface for creating an object, but lets subclasses decide which class to instantiate.
- Question:
  - What is the factory method pattern?

62

Design Patterns

- Clue:
  - This design pattern allows an object to alter its behavior when its internal state changes.
- Question:
  - What is the state pattern?

63

Design Patterns

- Clue:
  - This design pattern adapts the interface of a class into another interface that clients expect.
- Question:
  - What is the adapter pattern?

64

Design Patterns

- Clue:
  - This design pattern supports adding behavior to existing objects at run time, to avoid too many types of subclasses.
- Question:
  - What is the decorator pattern?

65

Design Patterns

- Clue:
  - This design pattern provides a surrogate for another object, to control access to it.
- Question:
  - What is the proxy pattern?

66

Design Patterns

- Clue:
  - In this design principle, classes should be open for extension but closed for modification.
- Question:
  - What is the open-closed principle?

67

Design Patterns

- Clue:
  - In this design principle, depend on abstractions not on concrete classes.
- Question:
  - What is the dependency inversion principle?

68

Design Patterns

- Clue:
  - In this design principle, for a class, reduce the number of classes it knows about and interacts with.
- Question:
  - What is the principle of least knowledge ?

69

Design Patterns

- Clue:
  - This law suggests the methods that may be called, to conform with the principle of least knowledge.
- Question:
  - What is the Law of Demeter?

70

- Clue:
  - Change a software system so that the external behavior does not change but the internal structure is improved.
- Question:
  - What is refactoring?

71

Refactoring

- Clue:
  - Risk is reduced in refactoring by proceeding in small steps and doing this after each step.
- Question:
  - What is testing?

72

Refactoring

- Clue:
  - Indications that the code may need refactoring.
- Question:
  - What are code smells?

73

Refactoring

- Clue:
  - Code with very complex, tangled control flow typified by lots of gotos.
- Question:
  - What is spaghetti code?

74

Refactoring

- Clue:
  - A class that gets increasingly larger, which may indicate poor separate of concerns.
- Question:
  - What is a blob class?

75

Refactoring

- Clue:
  - Potentially deodorant for bad smelling code.
- Question:
  - What are comments?

76

Refactoring

- Clue:
  - According to Donald Knuth, this is the root of all evil.
- Question:
  - What is premature optimization?

77

Refactoring

- Clue:
  - To reduce time, one uses more of this resource in caching or memoization.
- Question:
  - What is space?

78

Refactoring

- Clue:
  - An efficient method to evaluate a polynomial that reduces expensive multiplications.
- Question:
  - What is Horner's method?

79

Refactoring

- Clue:
  - Optimizing compilers fold and propagate these, because they do not change.
- Question:
  - What are constants?

80

Refactoring

- Clue:
  - A loop transformation to reduce the amount of loop housekeeping in each iteration.
- Question:
  - What is loop unrolling?

31

Refactoring

- Clue:
  - This converts interpreted bytecode to natively executed binary code at run time.
- Question:
  - What is a just-in-time compiler?

32

Refactoring

- Clue:
  - The 80/20 rule is also known as this principle.
- Question:
  - What is the Pareto principle?

33

Refactoring

- Clue:
  - In Java, use this class directly to append lots of strings more efficiently.
- Question:
  - What is StringBuilder?

34

Refactoring

- Clue:
  - An optimization where a method call is replaced with the actual body of the method.
- Question:
  - What is inlining?

35

Human Error

- Clue:
  - According to Donald Norman, interaction difficulties arise from these two gulfs.
- Question:
  - What are gulfs of execution and evaluation ?

36

Human Error

- Clue:
  - When you forget what to do in the middle of an activity.
- Question:
  - What is loss-of-activation error?

37

Human Error

- Clue:
  - When you do not see things that are in plain sight, such as a dancing gorilla.
- Question:
  - What is inattentional blindness?

38

Human Error

- Clue:
  - When your visual perception is momentarily blocked during eye movement.
- Question:
  - What is saccadic masking?

89

Human Error

- Clue:
  - When you think something is in one state, but it is actually in another.
- Question:
  - What is a mode error?

90

Human Error

- Clue:
  - Estimates the average time to make a simple decision from a set of choices (if subdivision applies).
- Question:
  - What is Hick's law?

91

Human Error

- Clue:
  - Estimates the average movement time to point to a target object using a pointing device.

$$T \approx a + b \log2(D/W + 1)$$

- Question:
  - What is Fitts's law?