How to Think out Quality Designs

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Software Quality

• A Reality that cannot be truly captured in words!

• But its attributes can be measured through close quantification
  – Correctness
  – Performance
  – Usability
  – Maintainability
  – Evolvability
  – Reusability
  – Repeatability ..
Our experiments in cs686 (Object Oriented Systems)

• Taught to masters students of CSE

• Students have basic CSE background
The process of learning quality designing?

• Insight into ends
  – Thorough understanding of the problem statement

• Insight into means
  – Mastery over solution methods
How to Acquire it?

• Repeated practice
  – Exposure to ends and means is obtained

• Self observation
  – Our understanding of ends and means gets refined
Finally, a generic problem solving process must develop so that one can deal with newer domains with ease.
The model

• A 3-stage model
  – Conceptualization
  – Construction
  – Disclosure

• Feedback at every stage
Composition of each stage

- Provision
- Extraction
- Assessment
Macro-Phase

Micro-Phase::Provision

Micro-Phase::Extraction

Micro-Phase::Assessment

0..1
An example starting point
The end design

Client

Component

operation ()
add () ..

aLeaf

operation ()

Composite

operation() add (..)

For all c in children
  c->operation()
Results and Observations

• Some designs were cracked once in 3 years!

• Discuss the wrong designs openly

• Students encouraged to interact, discuss alternatives and evolve their designs through interaction
Results and Observations

• Feedback with self-assessment leads to good results

• The learning process is a continuous one
Unidirectional instruction
Bidirectional Flow in instruction

Instruction + Feedback

Self correction → Quality
→ Confidence