

Debugging

Eden Burton <eden.burton@senecacollege.ca>
github repository:
(<https://github.com/Seneca-OOP244/SCD-Notes>)

Universal Polymorphism - Parametric

- separate interfaces from implementation
- clients use same logic using unrelated types
- implemented using templates
- compiler generates multiple copies of functions

Universal Polymorphism - Parametric

Template Syntax

```
template <typename T>  
  
    // ...  template body follows here  
  
T value; // value is of type T
```

Compiler replaces T with client argument within body

Testing

...process of determining whether a given set of inputs causes an unacceptable behaviour in a program...

..process of determining why
a given input causes
unacceptable behaviour and
what must be changed to
cause the behaviour to be
acceptable...

Approaches to Debugging

- detective
- mathematician
- safety expert
- psychologist
- computer scientist
- engineer

Detective

“defect is a crime”

- mystery to be solved “who, how, when, why”
 - have explicit data to reproduce problem
 - know what is common behaviour (requirements)
 - try to be always confirming a hypothesis
 - observe results
 - eliminate impossible causes with each observation (comment code)
 - don't guess

Mathematician

“defect is an anomaly is shown to be present ”

Create a proof to support diagnosis

- known laws,
- facts
- heuristics,
- exploiting similar problems
- intuition
- testing and verification

Debug By....

- **editing** make some changes re-run program
- **interaction** (debugger)
- **repeation** duplicate solution for similar cases

Debuggers

...a computer program used by programmers to test and debug a target program...

- GUI-based
 - Xcode, Visual Studio, Eclipse
 - easy to step through code, manage breakpoints
- text-based
 - GDB
 - remote debugging, GUI apps, “observer affect”