

SOFTWARE QUALITY ASSURANCE

John Abbott College JPC

Types of Errors

**M. E. Kabay, PhD, CISSP
Director of Education, NCSA
President, JINBU Corp**

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Checklists Useful

Text shows checklist p. 363 ff:

- User I/F
- Error handling
- Boundary-related errors
- Calculation errors
- Initial and later states
- Control-flow errors
- Errors in handling or interpreting data
- Race conditions
- Load conditions
- Hardware
- Source, version and I/D control
- Errors in the testing process

User I/F

- **Functionality**
- **Communication**
- **Command structure and entry**
- **Program rigidity**
- **Performance**
- **Output**

Error Handling

- **Error prevention**
- **Error detection**
- **Error recovery**

Boundary-Related Errors

- **Numeric boundaries**
- **Number and size of parameters**
- **Confines of space**
- **Time-limits**
- **Loops**
- **Memory and storage constraints**
- **Load limitations**
- **Hidden changes in algorithms**

Calculation Errors

- **Logic errors**
 - wrong design or formula
 - wrong breakdown into steps
 - typos
- **Arithmetic errors**
- **Precision problems**

Initial and Later States

- **Initialization of variables**
- **Loop-control variables**
- **Pointers, flags, registers**
- **Re-initialization**
- **Global vs local variables**
- **Pathological side-effects**

Control-Flow Errors

- **Program goes haywire**
- **Program stops**
- **Program hangs**
- **Conditions**

Errors in Handling or Interpreting Data

- **Parameter passing among routines**
- **Overflows**
- **Messaging system**
- **Corruption of data**

Race Conditions

- **Depending on expected completion sequence**
- **Checking state before action but without locking**
- **Deadly embrace**

Load Conditions

- **Resource unavailable**
- **Resources not returned**
- **Demands contiguous memory**
- **Input buffer / queue too small**
- **Fails to clear buffer**
- **Abbreviation of output**
- **Defining priorities**

Hardware

- **Failing to recognize HW failures**
- **Destination of output**
- **Device unavailable**
- **Returning to wrong pool**
- **Device forbidden**
- **Noisy or failed channel**
- **Time-outs**
- **Failing to close files**
- **EOF**
- **Misunderstood error codes**
- **Underusing device intelligence**
- **Initialization**

Source, Version and I/D Control

- **Inconsistent version numbers**
- **Old bugs reappear**
- **Incomplete update of repeated code**
- **Missing title at startup**
- **Missing or wrong version ID**
- **Missing or bad copyright message**
- **Source fails to compile exactly to production code**
- **Distribution media bad, incorrect or virus-infected**

Errors of the Test Process

- **Missing bugs**
- **Finding non-existent “bugs”**
- **Poor reporting**
- **Poor follow-up**

Homework

- Read Chapters 3, 4 & Appendix from your textbook
- Answer all the review questions distributed by the instructor
 - Avoid copying the textbook blindly -- you will not remember as much as if you think about the answers yourself
 - Use simple language; usually a few words or sentences will be ample
- Submit your work by 09:00 tomorrow morning.
- Because of the short time available, *do not be late* in submitting your review answers

