Issues with Algorithms
- More functionality when run in debug code
- Correct interpretation of data
- Compiled machine code matches
- Protection of shared memory to protect against race conditions
- Interaction with OS and system functions
- Least privilege
- Temporary files
- Interaction with other programs

All of these coding problems can be exploited by attackers

Writing Safe Code
Issue possibilities

1. Correct algorithm implementation
2. Correct machine instructions
3. Valid manipulation of data

1. handle all problem variants
   remove all extra test and debug code
   make all identifier and authenticator packets impossible to predict

2. Compiler is trusted and bug free

3. Data stored as bytes
   - all different size variables handled

Correct Use of Memory
- No memory leaks

Race Conditions
- No corrupted shared data
- No dead lock
OS Interaction
- programs run under control of OS
  includes environment variables

Using Least Privilege
- privilege escalation is less harmful

System Calls and Library Functions
- knowing their behavior
- knowing their vulnerabilities

Other Program Interaction
- handling exceptions
- data confidentiality/output

Program Output
- from all sources
  stored, sent over net, etc.