Exceptions and Special Member Functions Solutions

Destructors and Exceptions

- What happens if a destructor throws an exception?
  - If an exception is thrown and handled inside a try/catch block in the destructor, this is safe
  - If the exception is not handled by the destructor:
  - Only one stack unwinding process can occur at a time
  - If the destructor is called after an exception has already been thrown, there is a stack unwind already in progress
  - If the destructor then throws another exception which results in a stack unwinding, there will be two stack unwindings at the same time
  - Undefined behaviour

Constructors and Exceptions

- What happens if a constructor throws an exception?
  - If the exception is not handled inside the constructor, the partially completed object will be destroyed, along with its data members and any base class parts
  - An object does not exist (as far as the rest of the program is concerned) until its constructor has successfully completed
- Is it useful for a constructor to handle exceptions itself?
  - Only if the constructor can solve the problem and continue
- Is it useful for a constructor not to handle exceptions itself?
  - An exception indicates to the caller that the object could not be created
  - If no exception is thrown, the object was successfully created

Example of Constructor Throwing Exception

- Write a simple class whose constructor throws an exception
- Write a program which creates an object of this class inside a try/catch block which handles this exception
- Run your program. Compare the results when the constructor throws an exception with the results when it does not throw