

Exceptions: A Review

CS 351 Sep 9

Why?

- Cleaner Code! Better than error codes in return value
- Exceptions can have better information
- Easily passed “up”
- Throwable
 - Exception
 - Runtime exception (unchecked)
 - Everything else (checked)
 - Error (unchecked)

When?

- When a function cannot fulfill specification
 - Imagine a function that cannot return a reasonable value for some reason...
 - You could return Null or something...
 - Throw an exception instead
- Not an alternative to usefull return val
 - Consider a failed search (find) in an array..

Virtual Machine Exceptions

- `ArithmeticException`
 - Divide by zero
- `ArrayStoreException`
 - Store in array with incompatible type
- `NullPointerException`
 - Dereference Null Object
- There are more, know them for midterm

Runtime Errors

- You may or may not want to catch them
- Considered Unchecked
- Catching them would be nasty (ugly code)

Basic Rules

- Methods that throw:
 - Must advertise in “throws” clause
- If method calls a throwing method
 - Must handle the exception or...
 - Advertise in throws clause
- Java compiler insists on exception handling... except for unhandled ones...

Inheritance

- Exceptions are objects...
- `catch(C c)`
 - Catches all C's or
 - Exceptions derived from C (be carefull)
- Catch all?
 - `catch(Exception e)`

Inheritance

- When a child class overrides a parent method:
 - Child should not *add* types to throws clause
 - ...unless the new exception is a child of parent's
 - Child can also omit exception...
 - Why?

finally

- Finally block executes:
 - When try succeeds
 - When exception is thrown and catch is done
 - ... after either
- Use it to avoid redundant code that appears in both try and catch

General

- A message is nice:
 - throw new MyException(“usefull stuff here”);
- Many exceptions can be recoverable
 - File io exception need not kill program
- Don’t catch objects derived from
 - Java.lang.error
- Thread exceptions are special... more later

Questions...

- What classes may be caught?
- Difference between exception & error?
- Throw vs throws?
- Checked vs unchecked exceptions?
- Does the order of catches matter?
- Can methods throw multiple exceptions?
- Can you have multiple catches for a try?

What's wrong here?

```
try{ ... }  
catch(ParentException e) {}  
catch(ChildException e) {}
```

Midterm (after fall break)