

Py §14.5, M2 §10.8-10.13: Exceptions

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CMPT14x

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Quiz06: ch8-9 (10 mins, 20 pts)

- Define: **bit**, **byte**, **nibble**, **word**.
- Describe: **cylinder**, **head**, **sector**.
- Name and describe the four **set theory** operators we learned.
- $A = \{1, 3, 5\}$, $B = \{2, 3, 4\}$. (set theory, not Python)
 - $A \cap B = ?$
 - $A \cup B = ?$
- Let three file permission flags be: $r = 4$, $w = 2$, $x = 1$.
 - What is the **bitset** value corresponding to a file with both **read (r)** and **execute (x)** permission?

Quiz06: ch8-9 answers #1

- Define: bit, byte, nibble, word.
 - Bit: smallest unit of information, only two possible values: 0/1, true/false, high/low, charge/uncharge
 - Byte: 8 bits. Can represent one ASCII character.
 - Nibble: 4 bits. One hexadecimal digit.
 - Word: Unit of data processed by CPU. Most CPUs have 32-bit or 64-bit words.

Quiz06: ch8-9 answers #2

- Describe: **cylinder, head, sector**.
 - Cylinder: concentric tracks across all heads in a hard disk
 - Head: read/write head on a hard disk. Number of heads is number of useable surfaces, usually twice the number of platters
 - Sector: portion of surface under the head for a fixed rotational angle of the platter

Quiz06: ch8-9 answers #3-4

- Name and describe the four **set theory** operators we learned.
 - Union: everything in either A or B
 - Intersection: everything in both A and B
 - Set difference: everything in A but not in B
 - Symmetric set difference: in exactly one of A or B, not both
- $A = \{1, 3, 5\}$, $B = \{2, 3, 4\}$. (set theory, not Python)
 - $A \cap B = \{3\}$
 - $A \cup B = \{1, 2, 3, 4, 5\}$

Quiz06: ch8-9 answers #5

- Let three file permission flags be: $r = 4$, $w = 2$, $x = 1$.
 - What is the **bitset** value corresponding to a file with both **read (r)** and **execute (x)** permission?
 - $4 + 1 = 5$

Review last time (Py ch10)

■ Dictionaries

- Keys and values
- Basic dictionary methods:
 - ◆ `.keys()`, `.values()`, `.items()`
- Iterating through dictionaries
- Other dictionary methods:
 - ◆ `len()`, `del`, `in`, `.get()`, `.copy()`
- Application: hinting
 - ◆ Fibonacci example

Options for error handling

- Use a combination of these:
 - Ask the user to be **nice**:
 - ◆ User manual, precondition comments, prompts
 - **Print** an error message to screen
 - Set a result **flag**:
 - ◆ e.g., return False upon error
 - Panic and **die**: `sys.exit()`
 - Raise an **exception**: `ZeroDivisionError`

Exceptions

- Exceptions are a way of **terminating** execution of the current context
- When an exception is **raised** (thrown),
 - execution of the current procedure **stops**, and
 - Control jumps to the nearest **exception handler** (catches the exception)
- The exception handler can **cleanup**
- Execution then continues after that block
- If the exception reaches outermost level, an **error message** is automatically generated

try / except

- If an exception is **raised** within a **try** block,
- Execution of the block **terminates** and control jumps to the **except** clause:

```
try:
```

```
    while True:
```

```
        numer = input('Numerator: ')
```

```
        denom = input('Denominator: ')
```

```
        print '%d / %d = %d' % (numer, denom, numer / denom)
```

```
except:
```

```
    print 'Oops!'
```

Catching specific exceptions

- We can opt to catch only **specific** exceptions:

```
try:
```

```
    while True:
```

```
        numer = input('Numerator: ')
```

```
        denom = input('Denominator: ')
```

```
        print '%d / %d = %d' % (numer, denom, numer / denom)
```

```
except ZeroDivisionError:
```

```
    print 'Oops! Divide by zero!'
```

- Any other exception falls through to the next exception handler

More info on exceptions

- The Python tutorial is a good resource:
- <http://docs.python.org/tut/node10.html>
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TODO items

- HW07 due Mon: ch9 #6, 8, 16 (in Python).
- Lab07 due next Wed: ch9 (choose one):
 - #37+38: people db, matching
 - #40+41: online chequebook
 - #46: church directory
- Paper topic due next week Fri 9Nov
- Lab10 due last week of classes:
 - Choose one from Lab04-07, do in M2