# Parker, Prokofiev
# &
# Python

Programming is musicianship

# Charlie Parker

Jazz Musician

Alto Saxophone

# Sergei Prokofiev

Classical Pianist
Composer  Conductor

# Autodidact
# &
# OTJ

(on the Job Training)

3 Years of
Woodshedding

Daily Practice

Nightly Gigs

# Conservatory Trained

Formal and established pedagogy

Mastery of:
Instrument
Technique
Theory

Innovative
Compositions

# Orthogonal Approach

# Mastery of Language

Sergei Prokofiev

# Ten Pieces

## 1. March

**Allegro**

*pp*

1. 2.

8

*pp*

8

*p*

Explicit Instructions

Sergei Prokofiev

# Ten Pieces

## 1. March

**Allegro**

*pp*

*pp*

*p*

Perform as written

# Formal Specification

318

# PASSPORT

-CHARLIE PARKER

(BOP)

B♭maj7 C-7 F7 D-7 G7#5 C-7 F7

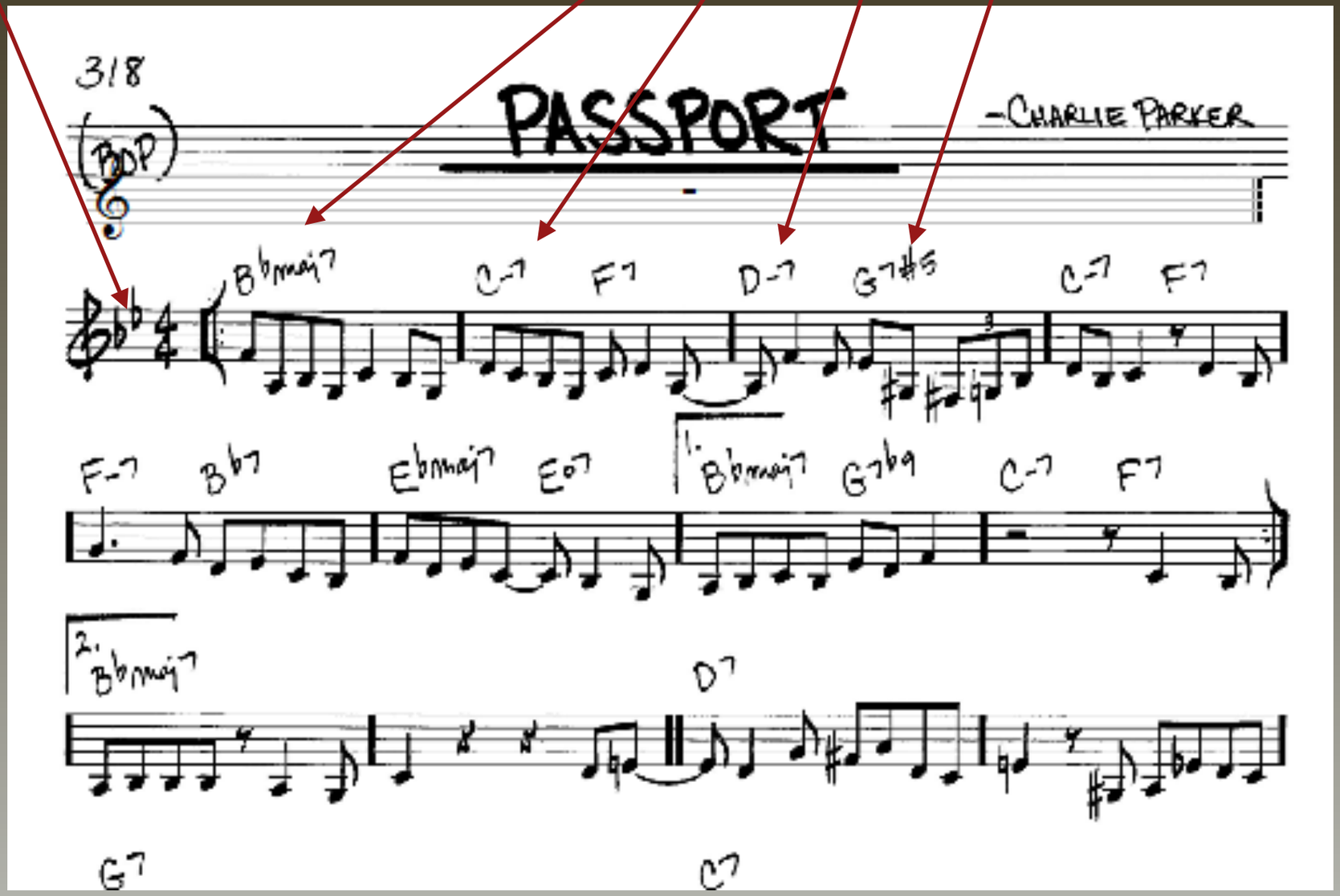
F-7 B♭7 E♭maj7 E°7 1. B♭maj7 G7♭9 C-7 F7

2. B♭maj7 D7

G7 C7

Instructions

Guidelines



Perform as suggested

# General Request

# Open to interpretation*

* If you know what you are doing

# Classical: Final Class

# Jazz: Extensible class

# Jazz: S.O.L.I.D

# Not Ashford and Simpson*

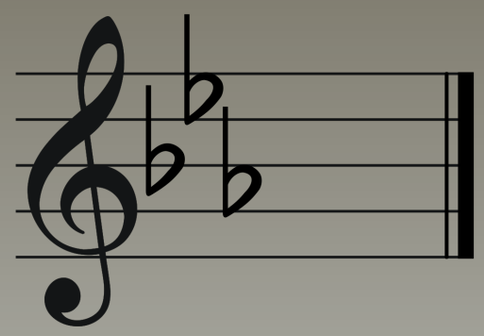
* Solid (as a rock)

S : Single Responsibility
O : Open/Closed
L : Liskov Substitution
I : Interface Segregation
D : Dependency Inversion

1, b3, 5, 7

```
@logging
def some function(self):
    pass

__slots__
```



# Contextual Information

# Mastery of Language

# Classical: Etudes

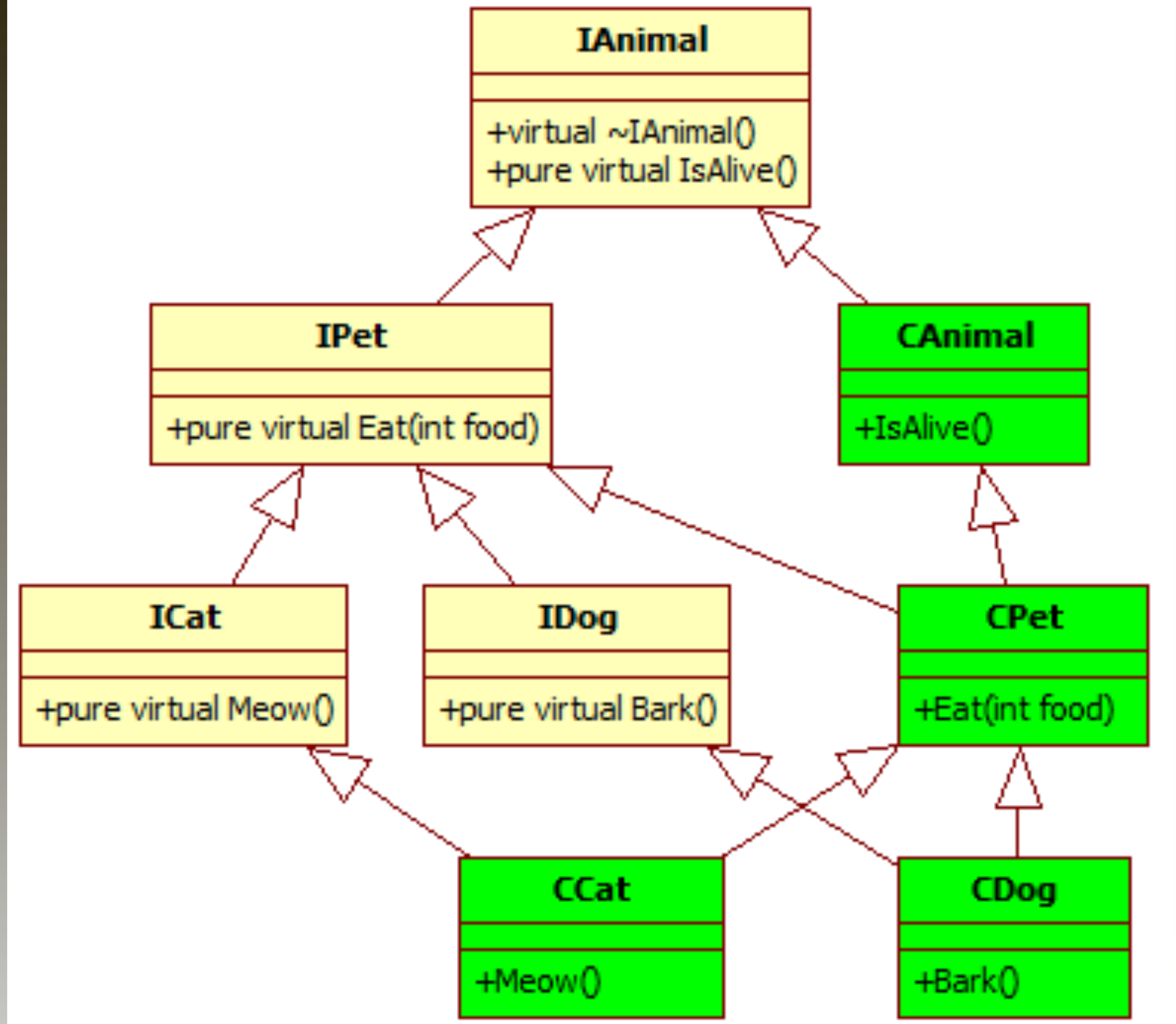
# Jazz: Standards

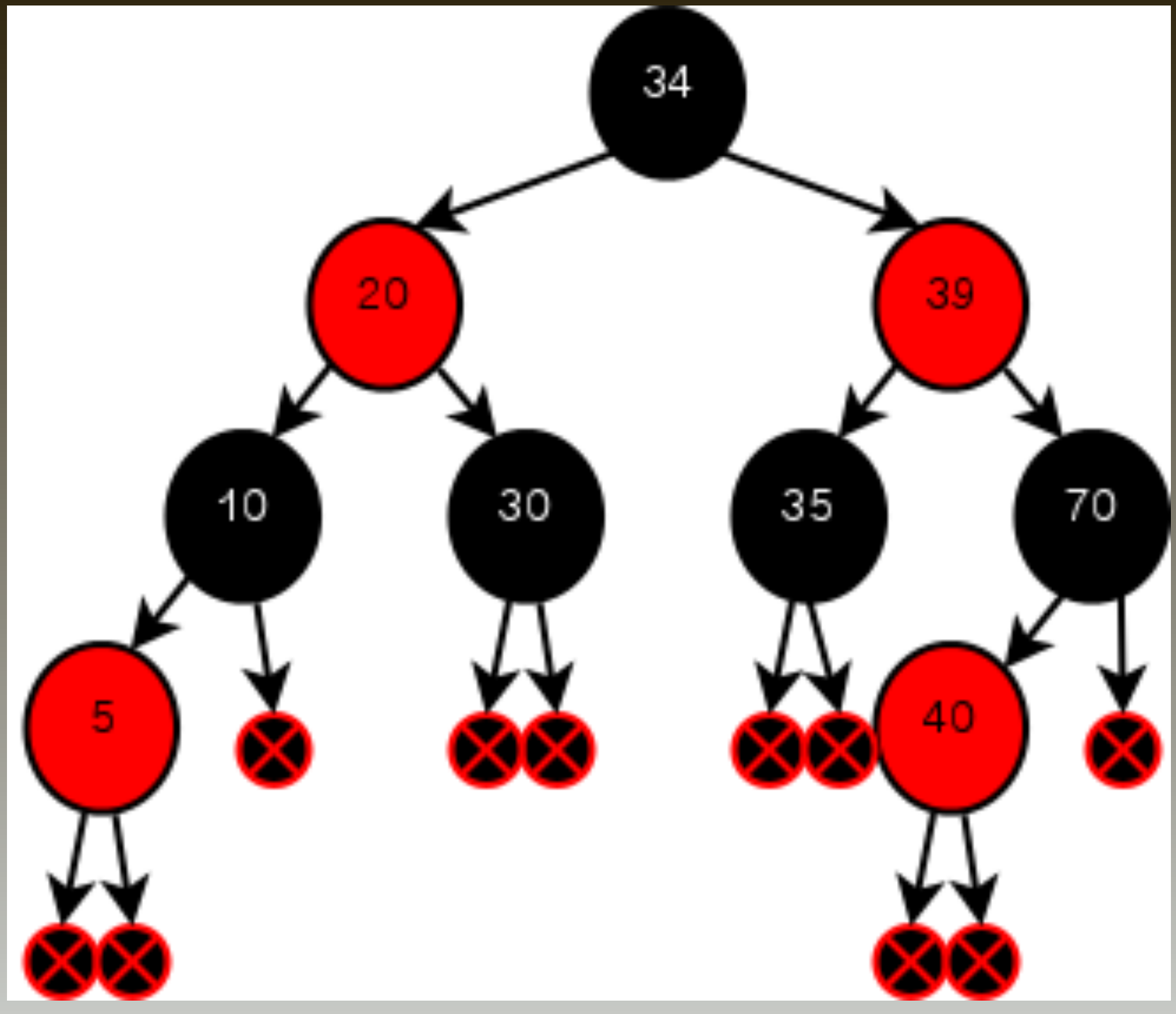
```
class EmitVisitor(asdl.VisitorBase):
    """Visit that emits lines"""

    def __init__(self, file):
        self.file = file
        self.identifiers = set()
        super(EmitVisitor, self).__init__()

    def emit_identifier(self, name):
        name = str(name)
        if name in self.identifiers:
            return
        self.emit("_Py_IDENTIFIER(%s);" % name, 0)
        self.identifiers.add(name)

    def emit(self, s, depth, reflow=True):
        # XXX reflow long lines?
        if reflow:
            lines = reflow_lines(s, depth)
        else:
            lines = [s]
        for line in lines:
            line = (" " * TABSIZE * depth) + line + "\n"
            self.file.write(line)
```


IAnimal
+virtual ~IAnimal()
+pure virtual IsAlive()
IPet
+pure virtual Eat(int food)
CAnimal
+IsAlive()
ICat
+pure virtual Meow()
IDog
+pure virtual Bark()
CPet
+Eat(int food)
CCat
+Meow()
CDog
+Bark()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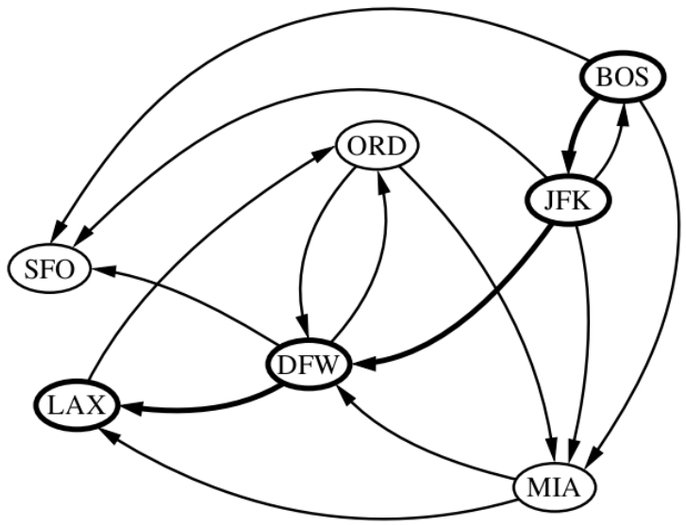
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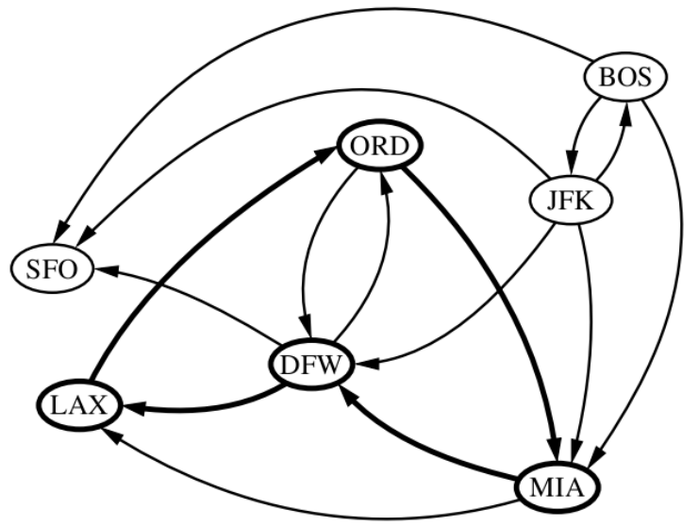
LAX
MIA

(a)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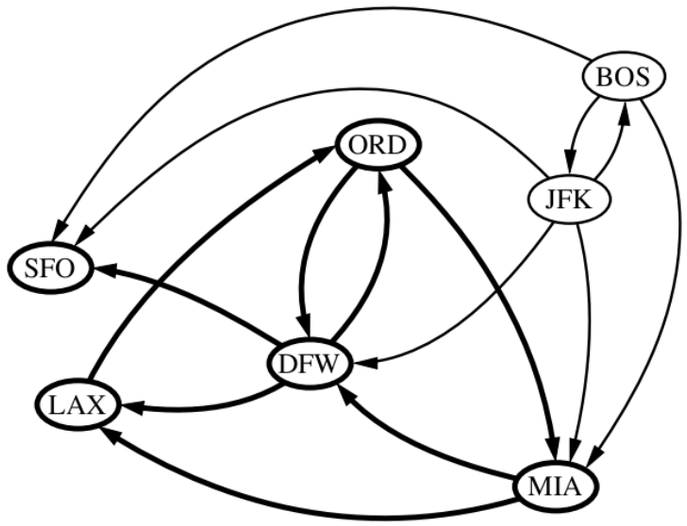
(b)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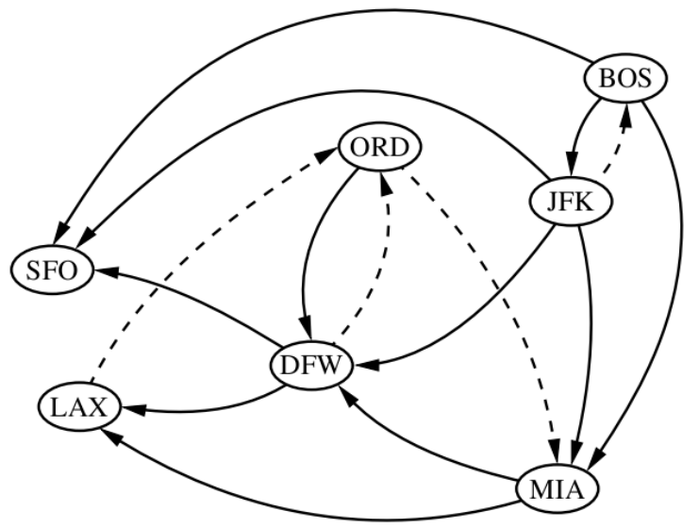
(c)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(d)

$$\mathbf{A}^{-1} = \frac{1}{\det(\mathbf{A})} \sum_{s=0}^{n-1} \mathbf{A}^s \sum_{k_1,k_2,\ldots,k_{n-1}} \prod_{l=1}^{n-1} \frac{(-1)^{k_l+1}}{l^{k_l}\, k_l!} \operatorname{tr}(\mathbf{A}^l)^{k_l}$$

# Big O Notation Summary

| Notation | Type | Examples | Description |
|---|---|---|---|
| O(1) | Constant | Hash table access | Remains constant regardless of the size of the data set |
| O(log n) | Logarithmic | Binary search of a sorted table | Increases by a constant. If n doubles, the time to perform increases by a constant, smaller than n amount |
| O(< n) | Sublinear | Search using parallel processing | Performs at less than linear and more than logarithmic levels |
| O(n) | Linear | Finding an item in an unsorted list | Increases in proportion to n. If n doubles, the time to perform doubles |
| O(n log(n)) | n log(n) | Quicksort, Merge Sort | Increases at a multiple of a constant |
| $O(n^2)$ | Quadratic | Bubble sort | Increases in proportion to the product of n*n |
| $O(c^n)$ | Exponential | Travelling salesman problem solved using dynamic programming | Increases based on the exponent n of a constant c |
| O(n!) | Factorial | Travelling salesman problem solved using brute force | Increases in proportion to the product of all numbers included (e.g., 1*2*3*4…) |

# Implementation

# Application of Theory

# Regular Practice

# Know Your Audience

# What to Learn?

# Know your business

# Data Structures

# Algorithms

# Computer Architecture

# Python Internals

# When to ask questions

# You Can Be Incredible Too!