Poetry in Python

Using Markov chains to simulate text

Omer Nevo
CEO @ NeoWize
Robert Frost

- You may have heard of
  - The Road Not Taken
  - Fire & Ice
  - A Boy’s Will

- Kidnap Robert Frost?
  - Cost of flights to US
  - Ethical Issues
  - Died in 1963
A Simpler Robert Frost

Needed: A simple model for text

Version 1: Words by probability

<table>
<thead>
<tr>
<th>Word</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>The</td>
<td>0.044</td>
</tr>
<tr>
<td>To</td>
<td>0.034</td>
</tr>
<tr>
<td>I</td>
<td>0.020</td>
</tr>
<tr>
<td>A</td>
<td>0.018</td>
</tr>
<tr>
<td>Of</td>
<td>0.017</td>
</tr>
</tbody>
</table>
A Simpler Robert Frost

“had Deeper to and fell my rest.
with coat remain him wasted grief
go different on down the me
A on his I The
Hold she to face hold his”
Markov Chains

- Needed: A better model for text
  - Must at least “feel” like real text
  - Must still be simple – Under 15 minutes of work

- Markov Chains
  - Remember the last words
  - Order: How far back do we remember
  - Choose the next depending on the state
Let’s Code

- Markov class – 27 lines of code (can probably be 15)

- Simple __init__
  - Pretty much nothing there

- Train method
  - Learn from text

- Generate method
  - Create Random text

Let’s Code together;
def __init__(self, order):
    self.order = order
    self.group_size = self.order + 1
    self.text = None
    self.graph = {}
    return

Order = How far back we remember

The training text

The actual information
Train

def train (self, filename):
def train(self, filename):
    self.text = file(filename).read().split()
    self.text = self.text + self.text[:self.order]
def train(self, filename):
    self.text = file(filename).read().split()
    self.text = self.text + self.text[:self.order]

    for i in range(0, len(self.text) - self.group_size):
        key = tuple(self.text[i:i + self.order])
        value = self.text[i + self.order]

        Get the state and the next word
```python
def train(self, filename):
    self.text = file(filename).read().split()
    self.text = self.text + self.text[:self.order]

    for i in range(0, len(self.text) - self.group_size):
        key = tuple(self.text[i:i + self.order])
        value = self.text[i + self.order]

        if key in self.graph:
            self.graph[key].append(value)
        else:
            self.graph[key] = [value]

    return
```

Save it!
def generate (self,length):
Generate

def generate (self,length):

    index = random.randint (0, len (self.text) - self.order)
    result = self.text[index : index + self.order]
def generate(self, length):
    index = random.randint(0, len(self.text) - self.order)
    result = self.text[index : index + self.order]

    for i in range(length):
        state = tuple(result[len(result) - self.order : ])
        next_word = random.choice(self.graph[state])
        result.append(next_word)

    return ''.join(result)
def generate(self, length):

    index = random.randint(0, len(self.text) - self.order)
    result = self.text[index : index + self.order]

    for i in range(length):
        state = tuple(result[len(result) - self.order : ])
        next_word = random.choice(self.graph[state])
        result.append(next_word)

    return " ".join(result[self.order : ])

Return result
Results?
“one way: you had in a week,
Can cure me up bodily,
chair and through, High in just
such as my strength put it
opened with a whipstock,”
“too clear water.
One drop fell from a fern,
and lo, a ripple Shook whatever it was all about.
There might be something He had in mind to say”
They must carry off that all that,' said Legolas. I stole. But the Cross-roads touching Gandalf’s eyes first, as if reason Mithrandir never felt that was standing on the valour has come to see the Ring, or in Rivendell
The ruffians had clubs in their houses, unless you should still be sitting here when Spring had passed into Nan Curunír, the Wizard's Vale, I think; but I see as much ale as was possible on such a chase as shall be moving this autumn,’ he said.
Scouts reported that they were on a shadowy sea, the high dim tops and broken pinnacles of old towers forlorn and dark. He turned to go back to his hole, and stood for a moment filled with dread Frodo became aware that it was not so, for a shapeless fear lived within the ruined walls. Nine Lords there were, and after the first bottle. There was plenty of everything left for Frodo.
Every poll with our jobs and Tanzania — never again; only a good to build the state of state and engaged in the reverse will all remember when I know that, right?

Then John Kerry tried to be complex, but she was a 2017 defense program for a great, great detail, I have to say something.
More

More texts
Punctuation
Words \ Letters

OH REALLY,
PLEASE TELL ME MORE
Questions?

Omer Nevo
CEO @ NeoWize