
Red Stork

Release 0.0.41

Jul 09, 2020

1	Quick Start	3
1.1	Tutorial	3
1.2	API Reference	6
2	Indices and tables	13
	Python Module Index	15
	Index	17

Yet another PDF parser. This one is based on [PDFium](#) engine.

CHAPTER 1

Quick Start

Sample:

```
from redstork.document import Document

doc = Document('sample.pdf')
print('Number of pages:', len(doc))
```

1.1 Tutorial

The philosophy of **redstork** is to map API to standard and well understood Python objects, like `list` and `dict`. In this tutorial we will use the following sample document.

1.1.1 Version

There are two version values in `redstork` module: PDFium build version, and Python package version:

```
import redstork

redstork.__pdfium_version__
>> 'cromium/4097'

redstork.__version__
>> '0.0.1'
```

1.1.2 Document

`Document` is the top-level object, and the only object that can be instantiated directly:

```
from redstork import Document

doc = Document('sample.pdf')

len(doc)
>> 15
```

As you can see, *Document* resembles standard Python *list*, containing *Page* objects.

PDF file creators can attach arbitrary key-value strings to the document, that we call meta (official PDF specs call it Document Information Dictionary). Most commonly these values describe Author, Title, and the name of software that created this document. Lets see the meta in our sample:

```
doc.meta['Title']
>> 'Red Stork'
```

You can change meta content and save the updated document:

```
doc.meta['Title'] = 'Awesome PDF parsing library'
doc.save('awesome.pdf')
```

Document has a lazily populated collection of fonts. Initially this collection is empty. As pages are being accessed and parsed, this collection is being populated:

```
list(doc[0]) # read all objects from page 1
len(doc.fonts)
>> 2
```

1.1.3 Page

Page represents PDF page. Get page by indexing a *Document* object, just like a normal list:

```
page = doc[0]
page.crop_box
>> (0.0, 0.0, 612.0, 792.0)
```

Page has *Page.label*, representing the page label (like xxi, or 128):

```
doc[2].label # this is the label of the third page
>> 'i'
```

A page of PDF document is a list-like object, containing concrete instances of *PageObject*:

```
page = ...
len(page) # how many objects on this page?
>> 17
```

1.1.4 PageObject

Abstract class *PageObject* describes an object on a PDF page. Concrete classes implementing *PageObject* are:

- *TextObject* - a string of characters
- *PathObject* - vector graphics
- *ImageObject* - a bitmap image

- *ShadingObject* - a shading object

Notable properties of all objects are:

- *PageObject.page()* - links back to the parent page
- *PageObject.matrix()* - transformation matrix of this object
- *PageObject.rect()* - rectangle of this object on the page

1.1.5 TextObject

Text object represents a string of characters. Each character is a three-tuple of (charcode, x, y), where charcode is a character code (this value is just an index in the font glyph table, not a text corresponding to this character!). x and y are placement coordinates of this character (in the coordinate system of this *TextObject* - first character typically has x, y == 0, 0).

Text object has font property. Here is how to use font to extract text of a *TextObject*:

```
def text_of(o):
    assert o.type == PageObject.OBJ_TYPE_TEXT, o
    text = []
    for c, x, y in o:
        text.append(o.font[c])
    return ''.join(text)

page = ...
for o in page:
    if o.type == PageObject.OBJ_TYPE_TEXT:
        text = text_of(o)
        print(text)
```

1.1.6 PathObject

Path object represents a set of vector drawing instructions.

1.1.7 ImageObject

Image object represents an embedded bitmap image. You can get the pixel width and height of the image, using the properties *ImageObject.pixel_width()* and *ImageObject.pixel_height()*.

Example:

```
page = ...
for o in page:
    if o.type == PageObject.OBJ_TYPE_IMAGE:
        print(o.pixel_width, o.pixel_height)
```

1.1.8 Font

Font object is a look-up table for character text, and also holds character glyphs (shape).

Font names in PDF file have a special prefix. To get a human-friendly one use *Font.simple_name()*.

Document contains a lazy font collection `Document.fonts()`. It is lazy, because just after document is opened, it is empty. As pages are accessed and parsed, this collection is populated.

Here is how to get `Glyph` object:

```
page = ...
for o in page:
    if o.type == PageObject.OBJ_TYPE_TEXT:
        for code, _, _ in o:
            glyph = o.font.load_glyph(code)
            print('Character with code %d has %d glyph instructions', code, len(glyph))
```

1.2 API Reference

1.2.1 Document

class `redstork.Document` (*file_name*, *password=None*)
PDF document.

A list-like container of pages. Sample use:

```
doc = Document('sample.pdf')
print("Number of pages:", len(doc))

for key, value in doc.meta.items():
    print('    ', key, ': ', value)
```

__init__ (*file_name*, *password=None*)
Create new PDF Document object, from a file.

Parameters

- **file_name** (*str*) – Name of PDF file
- **password** (*str*) – File password (optional)

numpages = `None`
int – total number of pages

meta = `None`
dict – document meta info (Author, Title, etc)

fonts = `None`
dict – font collection (populated lazily as pages are parsed)

__getitem__ (*page_index*)
Returns `Page` at this index.

Example:

```
doc = ...

page = doc[0]  # first page
```

Parameters **page_index** (*int*) – zero-based page index

Returns `Page` object

__len__()
Returns number of pages in this document

__iter__()
Iterate over the pages of this document

get_all_pages_size()
get width and height of all pages, without loading each page

changed
True is PDF was changed since the load (or last save)

save(filename)
Saves PDF file, resets `Document.changed()` to False

1.2.2 Page

class redstork.Page(*page, page_index, parent*)
Represents page of a PDF file.

crop_box
Page crop box.

media_box
Page media box.

rotation
Page rotation.

- 0 - no rotation
- 1 - rotated 90 degrees clock-wise
- 2 - rotated 180 degrees clock-wise
- 3 - rotated 270 degrees clock-wise

label
Page label.

__len__()
Number of objects on this page.

__getitem__(*index*)
Get object at this index.

__iter__()
Iterates over page objects.

flat_iter()
Iterates over all non-container objects (Text, Image, Path).

render_to_buffer(*scale=1.0, rect=None*)
Render page (or rectangle on the page) to memory (the pixel format is BGRx)

Parameters

- **scale** (*float*) – scale to use (default is 1.0, which will assume that 1pt takes 1px)
- **rect** (*tuple*) – optional rectangle to render. Value is a 4-tuple of (x0, y0, x1, y1) in PDF coordinates. if None, then page's `crop_box` will be used for rendering.

render(*file_name, scale=1.0, rect=None*)
Render page (or rectangle on the page) as PPM image file.

Parameters

- **file_name** (*str*) – name of the output file
- **scale** (*float*) – scale to use (default is 1.0, which will assume that 1pt takes 1px)
- **rect** (*tuple*) – optional rectangle to render. Value is a 4-tuple of (x0, y0, x1, y1) in PDF coordinates. if None, then page's *crop_box* will be used for rendering.

PageObject

class redstork.**PageObject** (*obj, index, typ, parent*)

OBJ_TYPE_TEXT = 1
see *TextObject*

OBJ_TYPE_PATH = 2
see *PathObject*

OBJ_TYPE_IMAGE = 3
see *ImageObject*

OBJ_TYPE_SHADING = 4
see *ShadingObject*

OBJ_TYPE_FORM = 5
Common superclass of all page objects

type = None
type of this object

matrix = None
transformation matrix of this object

page
Links back to the parent page

TextObject

class redstork.**TextObject** (*obj, index, typ, parent*)

Represents a string of text on a page

font = None
Font for this text object

font_size = None
font size of this text object

matrix = None
matrix for this page object

__len__()
Number of items in this string

__getitem__ (*index*)
Returns item at this index.
Each item is a 3-tuple: (charcode, x, y).

__iter__()
Iterates over items.

char_iter()
Iterates over characters (skips kerns)

text_geometry_iter()
Iterates over characters and returns character text and bounds

effective_font_size
Returns effective (user-visible) font size

scale_y
Returns Y-scale of text matrix transformation

scale_x
Returns X-scale of text matrix transformation

skew
Returns skew value of text matrix.

box (*x0*, *y0*, *x1*, *y1*)
Computes bounding box after transformation with text matrix

Font

class `redstork.Font` (*font*, *parent*)
Represents font used in a PDF file.

FLAGS_NORMAL = 0
Normal font

FLAGS_FIXED_PITCH = 1
Fixed pitch font

FLAGS_SERIF = 2
Serif font

FLAGS_SYMBOLIC = 4
Symbolic font

FLAGS_SCRIPT = 8
Script font

FLAGS_NONSYMBOLIC = 32
Non-symbolic font

FLAGS_ITALIC = 64
Italic font

FLAGS_ALLCAP = 65536
All-cap font

FLAGS_SMALLCAP = 131072
Small-cap font

FLAGS_FORCE_BOLD = 262144
Force-bold font

name
Font name in the PDF document.

simple_name
Font name without PDF-specific prefix.

flags

Font flags.

weight

Font weight.

is_vertical

True for vertical writing systems (CJK)

id

Tuple of (Object_id, Generation_id), identifying underlying stream in PDF file

load_glyph (*charcode*)

Load glyph, see *Glyph*

Parameters **charcode** (*int*) – the character code (see *TextObject*)

__getitem__ (*charcode*)

Returns Unicode text of this character.

Parameters **charcode** (*int*) – the character code (see *TextObject*) –

is_editable

True if font encoding can be changed

__setitem__ (*charcode*, *text*)

Updates font encoding.

Parameters

- **charcode** (*int*) – character code
- **text** (*str*) – new text for this character code

Raises *ReadOnlyEncodingError* – if encoding is read-one (no “ToUnicode” map in the font dictionary)

Glyph

class *redstork.Glyph* (*glyph*, *parent*)

Represents Glyph drawing instructions

LINETO = 0

LineTo instruction

CURVETO = 1

CurveTo instruction

MOVETO = 2

MoveTo instruction

__getitem__ (*i*)

Returns a 4-tuple representing this drawing instruction: (x, y, type, close).

Parameters **i** (*int*) – index of the instruction

ImageObject

class *redstork.ImageObject* (*obj*, *index*, *typ*, *parent*)

Represents image on a page.

matrix = None
matrix for this page object

pixel_width
width of the bitmap, in pixels

pixel_height
height of the bitmap, in pixels

PathObject

class redstork.**PathObject** (*obj, index, typ, parent*)
Represents vector graphics on a aage.

matrix = None
matrix for this page object

ShadingObject

class redstork.**ShadingObject** (*obj, index, typ, parent*)
Represents a shading object on a page.

FormObject

class redstork.**FormObject** (*obj, index, typ, parent*)
Represents a form (XObject) on a page - a container of other page objects (used internally).

matrix = None
matrix for this page object

form_matrix = None
transformation matrix for contained objects

flat_iter()
Iterates over all non-container objects in this form.

CHAPTER 2

Indices and tables

- [genindex](#)
- [modindex](#)
- [search](#)
- [Glossary](#)

r

redstork, [6](#)

Symbols

[__getitem__\(\)](#) (*redstork.Document* method), 6
[__getitem__\(\)](#) (*redstork.Font* method), 10
[__getitem__\(\)](#) (*redstork.Glyph* method), 10
[__getitem__\(\)](#) (*redstork.Page* method), 7
[__getitem__\(\)](#) (*redstork.TextObject* method), 8
[__init__\(\)](#) (*redstork.Document* method), 6
[__iter__\(\)](#) (*redstork.Document* method), 7
[__iter__\(\)](#) (*redstork.Page* method), 7
[__iter__\(\)](#) (*redstork.TextObject* method), 8
[__len__\(\)](#) (*redstork.Document* method), 6
[__len__\(\)](#) (*redstork.Page* method), 7
[__len__\(\)](#) (*redstork.TextObject* method), 8
[__setitem__\(\)](#) (*redstork.Font* method), 10

B

[box\(\)](#) (*redstork.TextObject* method), 9

C

[changed](#) (*redstork.Document* attribute), 7
[char_iter\(\)](#) (*redstork.TextObject* method), 9
[crop_box](#) (*redstork.Page* attribute), 7
[CURVETO](#) (*redstork.Glyph* attribute), 10

D

[Document](#) (*class in redstork*), 6

E

[effective_font_size](#) (*redstork.TextObject* attribute), 9

F

[flags](#) (*redstork.Font* attribute), 9
[FLAGS_ALLCAP](#) (*redstork.Font* attribute), 9
[FLAGS_FIXED_PITCH](#) (*redstork.Font* attribute), 9
[FLAGS_FORCE_BOLD](#) (*redstork.Font* attribute), 9
[FLAGS_ITALIC](#) (*redstork.Font* attribute), 9
[FLAGS_NONSYMBOLIC](#) (*redstork.Font* attribute), 9
[FLAGS_NORMAL](#) (*redstork.Font* attribute), 9

[FLAGS_SCRIPT](#) (*redstork.Font* attribute), 9
[FLAGS_SERIF](#) (*redstork.Font* attribute), 9
[FLAGS_SMALLCAP](#) (*redstork.Font* attribute), 9
[FLAGS_SYMBOLIC](#) (*redstork.Font* attribute), 9
[flat_iter\(\)](#) (*redstork.FormObject* method), 11
[flat_iter\(\)](#) (*redstork.Page* method), 7
[Font](#) (*class in redstork*), 9
[font](#) (*redstork.TextObject* attribute), 8
[font_size](#) (*redstork.TextObject* attribute), 8
[fonts](#) (*redstork.Document* attribute), 6
[form_matrix](#) (*redstork.FormObject* attribute), 11
[FormObject](#) (*class in redstork*), 11

G

[get_all_pages_size\(\)](#) (*redstork.Document* method), 7
[Glyph](#) (*class in redstork*), 10

I

[id](#) (*redstork.Font* attribute), 10
[ImageObject](#) (*class in redstork*), 10
[is_editable](#) (*redstork.Font* attribute), 10
[is_vertical](#) (*redstork.Font* attribute), 10

L

[label](#) (*redstork.Page* attribute), 7
[LINETO](#) (*redstork.Glyph* attribute), 10
[load_glyph\(\)](#) (*redstork.Font* method), 10

M

[matrix](#) (*redstork.FormObject* attribute), 11
[matrix](#) (*redstork.ImageObject* attribute), 10
[matrix](#) (*redstork.PageObject* attribute), 8
[matrix](#) (*redstork.PathObject* attribute), 11
[matrix](#) (*redstork.TextObject* attribute), 8
[media_box](#) (*redstork.Page* attribute), 7
[meta](#) (*redstork.Document* attribute), 6
[MOVETO](#) (*redstork.Glyph* attribute), 10

N

`name` (*redstork.Font* attribute), 9
`numpages` (*redstork.Document* attribute), 6

O

`OBJ_TYPE_FORM` (*redstork.PageObject* attribute), 8
`OBJ_TYPE_IMAGE` (*redstork.PageObject* attribute), 8
`OBJ_TYPE_PATH` (*redstork.PageObject* attribute), 8
`OBJ_TYPE_SHADING` (*redstork.PageObject* attribute), 8
`OBJ_TYPE_TEXT` (*redstork.PageObject* attribute), 8

P

`Page` (class in *redstork*), 7
`page` (*redstork.PageObject* attribute), 8
`PageObject` (class in *redstork*), 8
`PathObject` (class in *redstork*), 11
`pixel_height` (*redstork.ImageObject* attribute), 11
`pixel_width` (*redstork.ImageObject* attribute), 11

R

`redstork` (module), 6
`render()` (*redstork.Page* method), 7
`render_to_buffer()` (*redstork.Page* method), 7
`rotation` (*redstork.Page* attribute), 7

S

`save()` (*redstork.Document* method), 7
`scale_x` (*redstork.TextObject* attribute), 9
`scale_y` (*redstork.TextObject* attribute), 9
`ShadingObject` (class in *redstork*), 11
`simple_name` (*redstork.Font* attribute), 9
`skew` (*redstork.TextObject* attribute), 9

T

`text_geometry_iter()` (*redstork.TextObject* method), 9
`TextObject` (class in *redstork*), 8
`type` (*redstork.PageObject* attribute), 8

W

`weight` (*redstork.Font* attribute), 10