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# PDF: A Look Inside

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## Documentation on the WWW



Portable Document Format Language Reference Manual  
Version, Third Edition, Version 1.4 -- November 2001  
Published by Addison-Wesley, ISBN 0-201-75839-3

eBook version available from:

[http://partners.adobe.com/  
asn/developer/technotes/acrobatpdf.html](http://partners.adobe.com/asn/developer/technotes/acrobatpdf.html)

This presentation:

<http://kiosk.adobe.com/user/jking/pdftutorial/jcking00.pdf>

The examples:

<http://kiosk.adobe.com/user/jking/pdftutorial/jcking97.zip>



Hello World



# Hello World

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<<
  /Length 51
>>
stream
BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  (Hello World)Tj
ET
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet[/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ]
>>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



# Hello World

**%PDF-1.2**

**1 0 obj**

```
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

**2 0 obj**

```
<<
  /Length 51
>>
stream
  BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  (Hello World)Tj
  ET
endstream
endobj
```

**3 0 obj**

```
<<
  /ProcSet[/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj
```

**4 0 obj**

```
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

**5 0 obj**

```
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ]
>>
endobj
```

**6 0 obj**

```
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj
```

**trailer**

```
<<
  /Root 6 0 R
>>
```



# Hello World

%PDF-1.2

1 0 obj

```

<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

```

2 0 obj

```

<<
  /Length 51
>>
stream
BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  (Hello World)Tj
ET
endstream
endobj

```

3 0 obj

```

<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

```

4 0 obj

```

<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj

```

5 0 obj

```

<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ]
>>
endobj

```

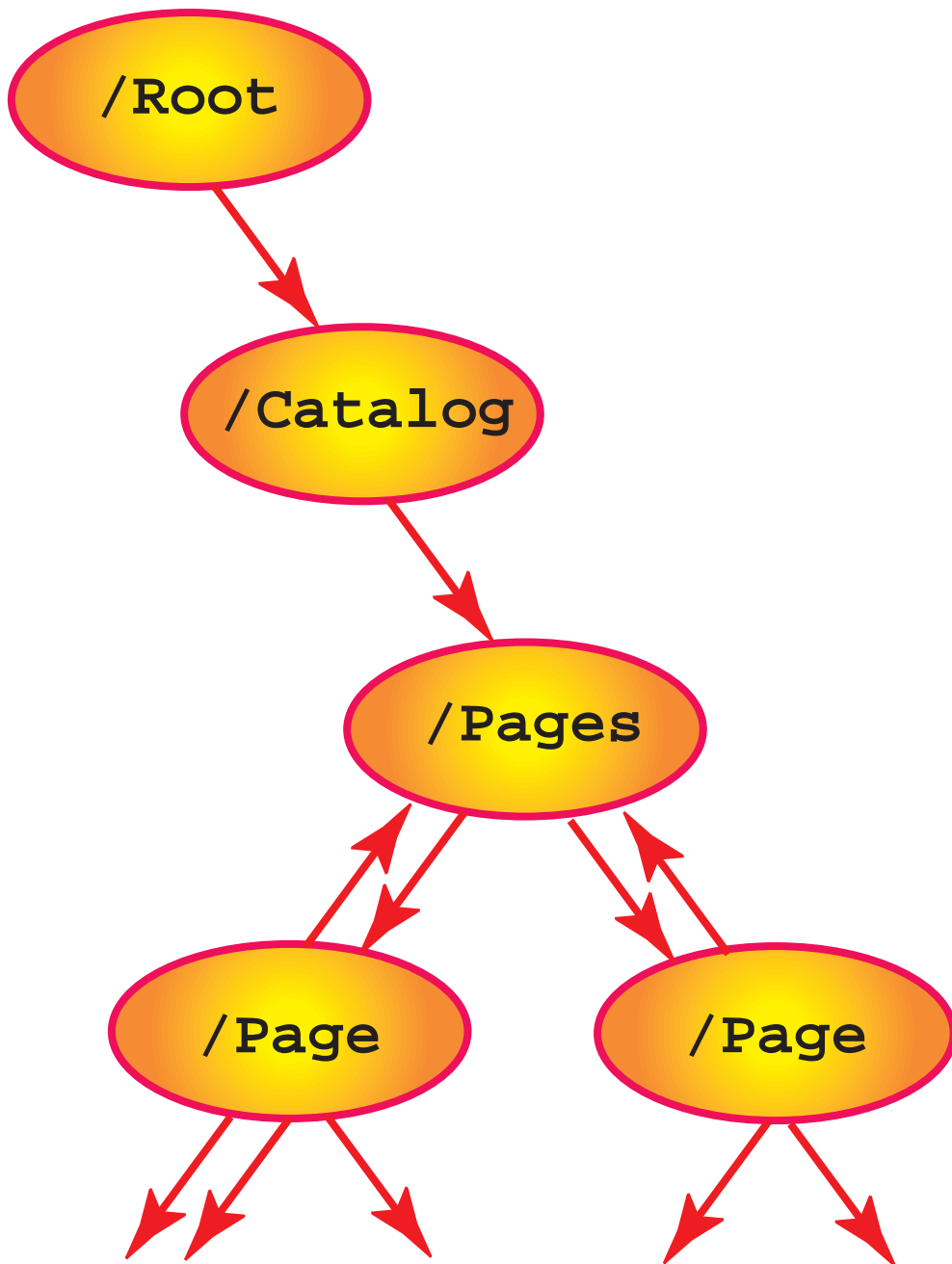
6 0 obj

```

<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>

```





Hello World



## Hello World - 50% Gray

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<<
  /Length 51
>>
stream
BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  0.5 g
  (Hello World)Tj
ET
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet[/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ]
>>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



## Postfix Notation

**operand-1    operand-2    operand-3    operator**

3 4 add                    --> 7  
3 4 add 3 mult            --> 21

**scale-x   skew-x   skew-y   scale-y   move-x   move-y   Tm**

1 0 0 1 260 600 Tm

**gray-level   g**

0.5 g

**string   Tj**

(Hello World) Tj

**font-internal-name   size   Tf**

/F1 24 Tf



## Hello World - 50% Gray

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<<
  /Length 51
>>
stream
BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  0.5 g
  (Hello World)Tj
ET
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet[/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

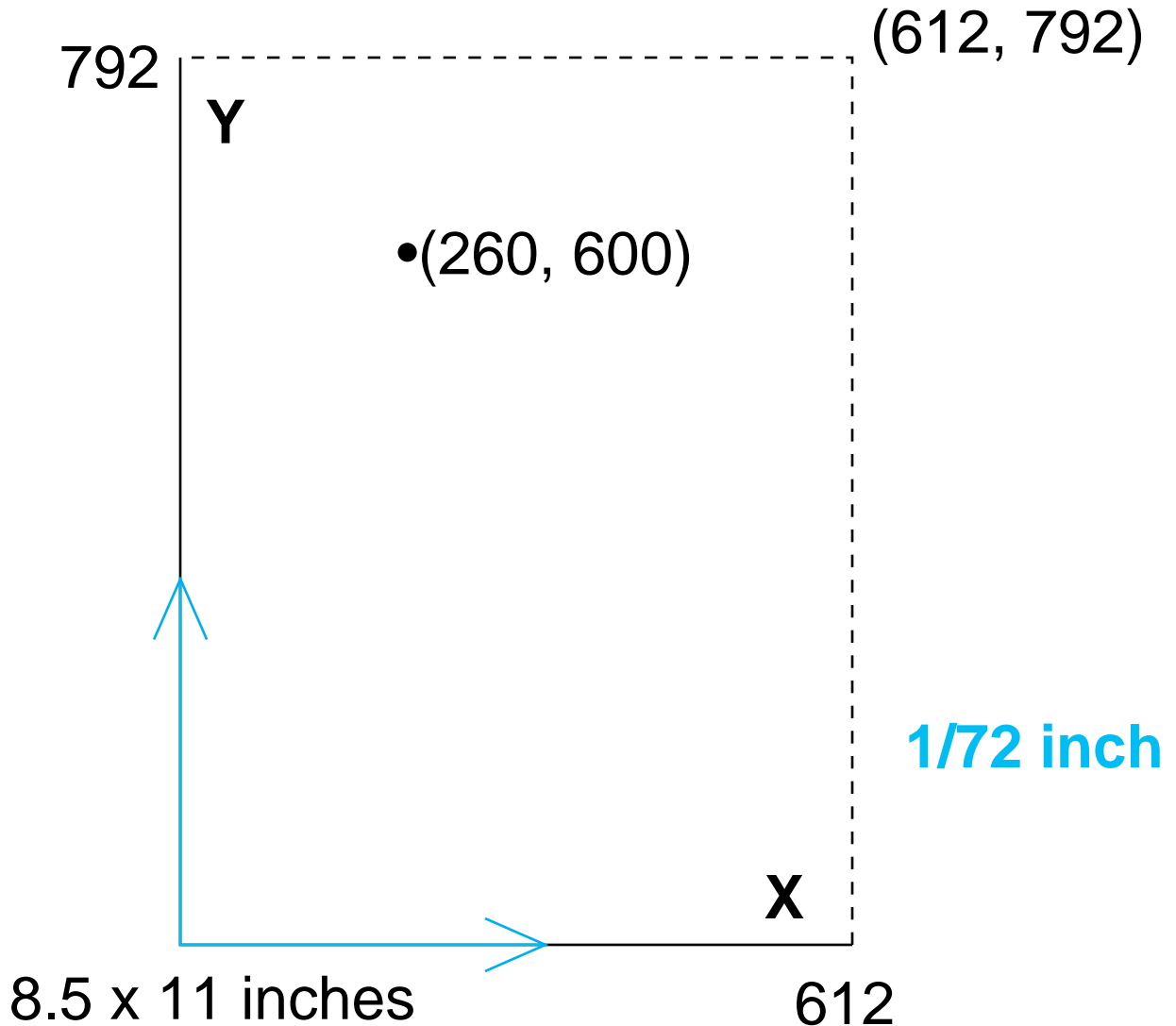
```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ]
>>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



Hello World



## Hello World - 50% Gray



```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<<
  /Length 51
>>
stream
BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  0.5 g
  (Hello World)Tj
ET
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet[/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ]
>>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



## Basic PDF Building Blocks

(Hello World) .....	<b>Strings</b> -- enclosed in ( )
12 4.55 .....	<b>Numbers</b>
/Dog	<b>Names</b>
[ /Dog 12 (a word) ]	<b>Arrays</b> -- enclosed in [ ]
<< /Size 12 /Color /red >>	<b>Dictionaries</b> -- enclosed in << >>
<u>1 0 R</u> <u>5 2 R</u> <u>129 0 R</u> ...	<b>References</b> (pointers)



## Nesting

```
[  
  <<  
    /Name (Jim)  
    /Age 39  
    /Children [(Heather) (Timothy) (Rebecca)]  
  >>  
  22  
  44.55  
]
```

```
<<  
  /MORE [ 22 33 44 55 1 ]  
  /LESS [ (dog) (cat) (mule) ]  
  /count 88  
>>
```



## Objects

```
3 0 obj
(a string object)
endobj
```

### Direct versus Indirect Objects

```
<< /dog (a labrador) >>
```

**can also be**

```
<< /dog 4 0 R >>
```

```
...
4 0 obj
(a labrador)
endobj
```



## Stream Objects

```
55 1 obj
<<
  /Length 31
  /Type /Content
  /special (true)
>>
stream
  this is the stream's content
endstream
endobj
```



## Hello World - 50% Gray

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<<
  /Length 51
>>
stream
BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  0.5 g
  (Hello World)Tj
ET
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R
>>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ]
>>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



Hello World



## Hello World - Device Dependent 100% Red

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<<
  /Length 51
>>
stream
  BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  1 0 0 rg
  (Hello World)Tj
  ET
endstream
endobj

3 0 obj
<<
  /ProcSet[/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj

5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ]
>>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



Hello World



## Hello World -- L\*a\*b\* Red

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<< /Length 51
>>
stream
  BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  /CS1 cs
  /AbsoluteColormetric
  ri
  63 127 127 sc
  (Hello World)Tj
  ET
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet[/PDF/Text]
  /Font <</F1 4 0 R>>
  /ColorSpace
  <</CS1
  [ /Lab <<
    /Range
    [-128 127 -128 127]
    /WhitePoint
    [0.951 1 1.089]
    >> ]
  >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ] >>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



Hello World



## Hello World -- Calibrated RGB Red

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<< /Length 51
>>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 600 Tm
    /CS2 cs
    1 0 0 sc
    (Hello World)Tj
  ET
endstream
endobj
```

```
3 0 obj
<</ProcSet[/PDF/Text]
  /Font <</F1 4 0 R>>
  /ColorSpace << /CS2
[ /CalRGB << /Gamma
[2.222 2.222 2.222]
  /Matrix
[0.412 0.213 0.019
  0.358 0.715 0.119
  0.181 0.072 0.951
] /WhitePoint
[0.951 1 1.089]>>
]
>> >>
endobj

4 0 obj
<</Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ] >>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



Hello World





# Blue Star

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 51 >>
stream
  BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  (Hello World)Tj
  ET

  0 0 1 rg
  315 572 m
  299 528 l
  339 554 l
  291 554 l
  331 528 l
  f
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet[/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```



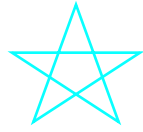
```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ] >>
endobj
```

```
6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj
```

```
trailer
<<
  /Root 6 0 R
>>
```



Hello World





Hello World -- **filled** with L\*a\*b\* Red /// Star -- **stroked** with Calibrated RGB Cyan

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 51 >>
stream
  BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  /CS1 cs
  /RelativeColormetric
  ri
  63 127 127 sc
  (Hello World)Tj
  ET

  /CS2 CS
  /Saturation ri
  0 1 1 SC
  315 572 m
  299 528 l
  339 554 l
  291 554 l
  331 528 l
  s
endstream
endobj
```

```
3 0 obj
<</ProcSet[/PDF/Text]/
Font <</F1 4 0 R>>
  /ColorSpace
  <</CS1
  [ /Lab << /Range
  [-128 127 -128 127]
  /WhitePoint
  [ 0.951 1 1.089]
  >> ] >>
  <</CS2
  [ /CalRGB <<
  /Gamma
  [2.222 2.222 2.222]
  /Matrix
  [0.412 0.213 0.019
  0.358 0.715 0.119
  0.181 0.072 0.951]
  /WhitePoint
  [0.951 1 1.089]
  >> ] >>
  >>
endobj
4 0 obj
<<
```

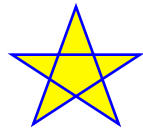


Hello World -- **filled** with L\*a\*b\* Red /// Star -- **stroked** with Calibrated RGB Cyan

```
/Type /Font          | 6 0 obj
/Subtype /Type1     | <<
/Name /F1           |   /Type /Catalog
/BaseFont/Helvetica |   /Pages 5 0 R
>>                 | >>
endobj              |
                    |
                    | trailer
                    | <<
                    |   /Root 6 0 R
                    | >>
                    |
5 0 obj             |
<<                 |
  /Type /Pages     |
  /Kids [ 1 0 R ] |
  /Count 1         |
  /MediaBox        |
    [ 0 0 612 792 ] >>
endobj              |
```



Hello World





Star -- **filled** with L\*a\*b\* Yellow /// Star -- **stroked** with Calibrated RGB Blue

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 51 >>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 600 Tm
    /CS1 cs
    63 127 127 sc
    (Hello World)Tj
  ET

  100 0 127 sc

  /CS2 CS
  0 0 1 SC
  315 572 m
  299 528 l
  339 554 l
  291 554 l
  331 528 l
  b
endstream
endobj
```

```
3 0 obj
<</ProcSet[/PDF/Text]
/Font <</F1 4 0 R>>
/ColorSpace
  <</CS1
    [ /Lab << /Range
      [-128 127 -128 127]
      /WhitePoint
      [ 0.951 1 1.089]
      >> ] >>
  <</CS2
    [ /CalRGB <<
      /Gamma
      [2.222 2.222 2.222]
      /Matrix
      [0.412 0.213 0.019
        0.358 0.715 0.119
        0.181 0.072 0.951]
      /WhitePoint
      [0.951 1 1.089]
      >> ] >>
  >>
endobj
```



Star -- **filled** with L\*a\*b\* Yellow /// Star -- **stroked** with Calibrated RGB Blue

```
4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj

5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ] >>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



## A PostScript File Equivalent to Example 8

<pre> %!PS % PostScript file that generates same output as example 08  /Helvetica findfont 24 scalefont setfont 260 600 moveto  [/CIEBasedABC &lt;&lt; /RangeABC [0 100 -128 127 -128 127] /DecodeABC [ {16 add 116 div} bind {500 div} bind {200 div} bind] /MatrixABC [1 1 1 1 0 0 0 0 -1] /DecodeLMN [ {dup 6 29 div ge {dup dup mul mul} </pre>	<pre> {4 29 div sub 108 841 div mul} ifelse 0.9505 mul} bind {dup 6 29 div ge {dup dup mul mul} {4 29 div sub 108 841 div mul} ifelse} bind {dup 6 29 div ge {dup dup mul mul} {4 29 div sub 108 841 div mul} ifelse 1.0890 mul} bind] /WhitePoint [0.9505 1 1.0890] &gt;&gt;] <b>setcolorspace</b> <b>63 127 127 setcolor</b>  <b>(Hello World) show</b> </pre>	<pre> <b>100 0 127 setcolor</b> <b>315 572 moveto</b> <b>299 528 lineto</b> <b>339 554 lineto</b> <b>291 554 lineto</b> <b>331 528 lineto</b>  gsave <b>fill</b> grestore  [/CIEBasedABC &lt;&lt; /DecodeLMN [ {1 0.45 div exp} bind dup dup] /MatrixLMN [0.412 0.213 0.019 0.358 0.715 0.119 0.181 0.072 0.951 ] /WhitePoint [0.9505 1 1.0890] &gt;&gt;] <b>setcolorspace</b> <b>0 0 1 setcolor</b> </pre>
---	--	---

## A PostScript File Equivalent to Example 8

```
closepath  
true setstrokeadjust  
stroke  
  
showpage
```



Hello World





## Star -- in new coordinate system (device dependend RGB blue)

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 51 >>
stream
  BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  (Hello World)Tj
  ET

  0 0 1 rg

  4 0 0 4 315 550 cm
  0 5.5 m
  -4 -5.5 l
  6 1 1
  -6 1 1
  4 -5.5 l
  f
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet[/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```



## Star -- in new coordinate system (device dependend RGB blue)

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ] >>
endobj
```

```
6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj
```

```
trailer
<<
  /Root 6 0 R
>>
```



Hello World



# A Heart -- Using Bezier Curves (filled with L\*a\*b\* and stroked in device black)



```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 51 >>
stream
  BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  (Hello World)Tj
  ET
  q
  0 0 1 rg
  4 0 0 4 315 550 cm
  0 5.5 m
  -4 -5.5 l
  6 1 l
  -6 1 l
  4 -5.5 l
  f
  Q
```

```
/CS1 cs
63 127 127 sc
1 0 0 1 315 490 cm
0 0 m
-7 23 -40 19
-15 -17 c
-7.5 -27.8 -11 -22
0 -35 c
11 -22 7.5 -27.8
15 -17 c
40 19 7 23
0 0 c
b
endstream
endobj
```

## A Heart -- Using Bezier Curves (filled with L\*a\*b\* and stroked in device black)



```
3 0 obj
<</ProcSet[/PDF/Text]/
Font <</F1 4 0 R>>
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
[ 0.951 1 1.089]
>> ] >>

<</CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
[0.951 1 1.089]
>> ] >>

>>

endobj
```

```
4 0 obj
<<
/Type /Font
/Subtype /Type1
/Name /F1
/BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
/Type /Pages
/Kids [ 1 0 R ]
/Count 1
/MediaBox
[ 0 0 612 792 ] >>
endobj

6 0 obj
<<
/Type /Catalog
/Pages 5 0 R
>>
endobj

trailer
<<
/Root 6 0 R
>>
```




Hello World





## Adobe Logo as Sampled Image Data (included directly in page contents)

```

 obj
<</ProcSet[/PDF/Text]
/Font <</F1 4 0 R>>
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
[ 0.951 1 1.089]
>> ] >>

<</CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
[0.951 1 1.089]
>> ] >>
>>
endobj

4 0 obj
<<
/Type /Font
/Subtype /Type1
/Name /F1
/BaseFont/Helvetica
>>
endobj

5 0 obj
<<
/Type /Pages
/Kids [ 1 0 R ]
/Count 1
/MediaBox
[ 0 0 612 792 ] >>
endobj

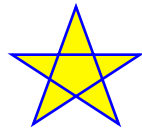
6 0 obj
<<
/Type /Catalog
/Pages 5 0 R
>>
endobj

trailer
<<
/Root 6 0 R
>>

```



Hello World



# Adobe Logo as Sampled Image Data -- No New Lines



```
%PDF-1.2
% based on e08.pdf
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 1343 >>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 600 Tm
    /CS1 cs
    63 127 127 sc
    (Hello World)Tj
  ET
  100 0 127 sc
  /CS2 CS
  0 0 1 SC
  315 572 m
  299 528 l
  339 554 l
  291 554 l
  331 528 l
  b
```

100 0 0 100 65 672 cm

```
BI
  /W 35 /H 32 /BPC 8
  /CS /DeviceGray
```

ID

```
ccccccccccP~~~~~~Pcccccccccccccc
cccccccf~~~~~~fcccccccccccccccc
ccf~~~~~~fccccccccccccccccc'
~~~~~'cccccccccccccccccf~~~~~~
~~~~~fccccccccccccccccø~~~~~
øccccccccccccccccø~~~~~øcc
cccccccccccccc±~~~~~±cccccccc
cccccccccc~~~~~~cccccccccccc
ccccø~~~~~øccccccccccccccΔ
~~~~~Δcccccccccccccc~~~~~~
~~~~~ccccccccccccP~~~~~~P
~~~~~Pcccccccccccccc,~~~~~f~f~
~~~~~,cccccccccccccc~~~~~~P~P~
~'cccccccccccc'~~~~~cc~~~~~'cc
cccccccccf~~~~~~Δccø~~~~~~fcccc
ccccø~~~~~øccø~~~~~øccccccccø
~~~~~'cccccc~~~~~~øcccccccc~
~~~~~™cccc™~~~~~™cccccc~
øccccccø~~~~~ccccccø~~~~~Pccc
ccccø~~~~~øccccccΔ~~~~~fcccccf
~~~~~Δccccccø~~~~~øcccccccc'
~~~~~øccccP~~~~~~øccccccccø
~Pcccc,~~~~~øΔΔΔΔΔcccc,~~~~~c
ccø~~~~~™ccccP~~~~~~øcc'
~~~~~'ccccø~~~~~'cf~~~~~~
~~~~~fccccΔ~~~~~fP~~~~~~
~~~~~øcccf~~~~~~P~I~~~~~~
~~~~~øcccc'~~~~~ø~~~~~
~~~~~™cccc™~~~~~
```

```
EI
endstream
endobj
```

## Adobe Logo as Sampled Image Data -- No New Lines

```
3 obj
<</ProcSet[/PDF/Text]
/Font <</F1 4 0 R>>
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
[ 0.951 1 1.089]
>> ] >>

<</CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
[0.951 1 1.089]
>> ] >>
>>
endobj

4 0 obj
<<
/Type /Font
/Subtype /Type1
/Name /F1
/BaseFont/Helvetica
>>
endobj

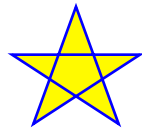
5 0 obj
<<
/Type /Pages
/Kids [ 1 0 R ]
/Count 1
/MediaBox
[ 0 0 612 792 ] >>
endobj

6 0 obj
<<
/Type /Catalog
/Pages 5 0 R
>>
endobj

trailer
<<
/Root 6 0 R
>>
```



Hello World





# Hello World, Star, Logo -- Page Contents Compressed

```
%PDF-1.2
% based on e12.pdf
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<<
  /Filter /LZWDecode
  /Length 452
>>
stream
ÄÄÄ-yb
C060D
„!¥B+*`Ñ2úΔsF√1f
d7í...f34PH2õ
ÜÖ\fir6%CP4ãâ" )T<
6S#Ä/î@S!ÉFc@Äj7§
ΔÜCëÖXd8*C:Ë`k±V‡^k
Eé∅_∞ÉLPÍFÌAãUF'Åé4B
$; , ò÷H¬†Ñ"Å@8£à%C)
ÿ`c2ëCF»4íD#tZ=&âp`
ju+ç.∑ ]≠uj∂N≠~∅ZçÿnT[m
, 5©πÿ57ªTßrî·îó,mí`ì≠
xÛ50-~ëc`ÿ,zj&flcTαÎ¶°α
$flUç„'1j∅é7>Ä-ÁÈ-fl.≥Ü
, „m6<p`ë∅ftfi∑Ô{F~7.
lJA
î`-∅kê/πn3 -
<N3ú/].-
ªÆ@∅îNaT`fÆ4N∅@≠ÃF`√∞
```

```
K]æÆSô
¥è;fl ¥∞cç¥ëãdf∂±ke¥-
ªk7/≥D,DF4•)¥≤Ér,√CQ
...0>E#;-'E!5N}--
Ö·7' ; )=αD,æo<-
$7Æ4...-KÑlR‡'Ã
endstream
endobj
```

# Hello World, Star, Logo -- Page Contents Compressed



```
3 0 obj
<</ProcSet[/PDF/Text]/
Font <</F1 4 0 R>>
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
[ 0.951 1 1.089]
>> ] >>

<</CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
[0.951 1 1.089]
>> ] >>
>>
endobj
4 0 obj
<<
```

```
/Type /Font
/Subtype /Type1
/Name /F1
/BaseFont/Helvetica
>>
endobj

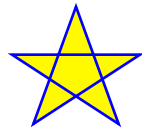
5 0 obj
<<
/Type /Pages
/Kids [ 1 0 R ]
/Count 1
/MediaBox
[ 0 0 612 792 ] >>
endobj
```

```
6 0 obj
<<
/Type /Catalog
/Pages 5 0 R
>>
endobj

trailer
<<
/Root 6 0 R
>>
```



Hello World



# Hello World, Star, Logo -- With Cross Reference



```
%PDF-1.2
% based on e12.pdf
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<<
  /Filter /LZWDecode
  /Length 452
>>
stream
ÄäÄ-yb
C060D
„!¥B+*`Ñ2úΔsF√1fd7
í...f34PH2ö
ÛÒ\fir6%CP4ãâ" )T≤6S
#Ä/î@S!ÉFc@Äj7§ΔÜCë
ÕXd8*C:Ë`k±V‡^kEé∅_∞
ÉLPÍFÌAãUF' Åé4B$; , ò
÷H-†Ñ" Å@8fà%C)ÿ`c2ëE
F»4íD#tZ=&âp` `ju+ç.Σ
]≠ujðN≠~∅ZçÿnT[m,5∅πÿ5
7ªTßrî·Îó,mí`î≠xÛ50 --
ëc"ÿ,z|&flcTαÎ¶°α$flUç„'
1|∅é7≥Ä-ÁÈ-fl.≥Ü, „m6<
p`ë∅ftfiΣÔ{F~7.1JA
ì`-∅kê/πn3 -<N3ú/|. -
ªÆ∅îiNaT`fÆ4N∅@≠ÃF`√∞
```

```
K]æÆSô
¥è;fl¥∞ç¥ëãdf∂±ke¥-
ªk7/≥D,DF4•)¥≤Ér,√CQ
...0≥E#; - °E!5N} --
Û·7' i )=∅D,æ∅<-
$7Æ4...-KÑlR‡'Ã
endstream
endobj
```

## Hello World, Star, Logo -- With Cross Reference



```
3 0 obj
<</ProcSet[/PDF/Text]
/Font <</F1 4 0 R>>
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
[ 0.951 1 1.089]
>> ] >>

<</CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
[0.951 1 1.089]
>> ] >>
>>
endobj
```

```
4 0 obj
<<
/Type /Font
/Subtype /Type1
/Name /F1
/BaseFont/Helvetica
>>
endobj

5 0 obj
<<
/Type /Pages
/Kids [ 1 0 R ]
/Count 1
/MediaBox
[ 0 0 612 792 ] >>
endobj
```

```
6 0 obj
<<
/Type /Catalog
/Pages 5 0 R
>>
endobj

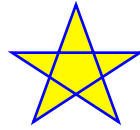
7 0 obj
<<
/ModDate
(D:19980307173849)
>>
endobj
```



```
xref
0 8
0000000000 65535 f
0000000016 00000 n
0000000102 00000 n
0000000626 00000 n
0000000947 00000 n
0000001033 00000 n
0000001124 00000 n
0000001177 00000 n
trailer
<</Size 8
  /Info 7 0 R
  /Root 6 0 R
  /ID[
    <516b0039a4e03b90b
      d0a72f349225b02>
    <516b0039a4e03b90b
      d0a72f349225b02>]
>>
startxref
1228
%%EOF
```



Hello World





## One Adobe Logo Imaged Twice (sharing)

```
%PDF-1.2
% based on e12.pdf
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 239 >>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 600 Tm
    /CS1 cs
    63 127 127 sc
    (Hello World)Tj
  ET
  100 0 127 sc
  /CS2 CS
  0 0 1 SC
  315 572 m
  299 528 l
  339 554 l
  291 554 l
  331 528 l
b
```

```
0 0 m
q
100 0 0 100
65 672 cm

/AdobeLogo Do

Q
100 0 0 100
365 672 cm

/AdobeLogo Do

endstream
endobj

3 0 obj
<</ProcSet[
  /PDF/Text]
  /Font <</F1 4 0 R>>

  /XObject
<</AdobeLogo 7 0 R >>
```

## One Adobe Logo Imaged Twice (sharing)

```

/FlorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
 [ 0.951  1  1.089]
>> ] >>

<</CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
 [0.951  1  1.089]
>> ] >>
>>
endobj

4 0 obj
<<
 /Type /Font
 /Subtype /Type1
 /Name /F1
 /BaseFont/Helvetica
>>
endobj

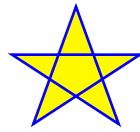
5 0 obj
<<
 /Type /Pages
 /Kids [ 1 0 R ]
 /Count 1
 /MediaBox
   [ 0 0 612 792 ] >>
endobj

6 0 obj
<<
 /Type /Catalog
 /Pages 5 0 R
>>
endobj
```



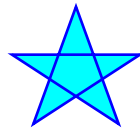


Page 1





Page 2



## Two Page Document (“Hello World” becomes “Page 1”, “Page 2”)



```
%PDF-1.2
% based on e14.pdf
5 0 obj
<<
  /Type /Pages
  /Kids
    [1 0 R 8 0 R]
  /Count 2
  /MediaBox
    [ 0 0 612 792 ]
>>
endobj

1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<< /Length 220 >>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 600 Tm
    /CS1 cs
    63 127 127 sc
    (Page 1)Tj
  ET
  100 0 127 sc
  /CS2 CS
  0 0 1 SC
  315 572 m
  299 528 l
  339 554 l
  291 554 l
  331 528 l
  b
  0 0 m
  q
  100 0 0 100
  65 672 cm
  /AdobeLogo Do
  Q
  100 0 0 100
  365 672 cm
  /AdobeLogo Do
endstream
endobj

3 0 obj
<</ProcSet[
  /PDF/Text]
  /Font <</F1 4 0 R>>

  /XObject
<</AdobeLogo 7 0 R >>
```

## Two Page Document (“Hello World” becomes “Page 1”, “Page 2”)



```
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
 [ 0.951  1  1.089]
>> ]

/CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
 [0.951  1  1.089]
>> ] >>
>>
endobj
```

## Two Page Document (“Hello World” becomes “Page 1”, “Page 2”)



```
8 0 obj
```

```
<<
```

```
  /Type /Page
```

```
  /Parent 5 0 R
```

```
  /Resources 9 0 R
```

```
  /Contents 10 0 R
```

```
>>
```

```
endobj
```

```
10 0 obj
```

```
<< /Length 220 >>
```

```
stream
```

```
BT
```

```
  /F1 24 Tf
```

```
  1 0 0 1 260 600 Tm
```

```
  /CS1 cs
```

```
  63 0 127 sc
```

```
  (Page 2)Tj
```

```
ET
```

```
  90 -100 -50 sc
```

```
  /CS2 CS
```

```
  0 0 1 SC
```

```
  315 572 m
```

```
  299 528 l
```

```
  339 554 l
```

```
  291 554 l
```

```
  331 528 l
```

```
b
```

```
0 0 m
```

```
q
```

```
100 0 0 100
```

```
65 672 cm
```

```
/AdobeLogo Do
```

```
Q
```

```
100 0 0 100
```

```
365 672 cm
```

```
/AdobeLogo Do
```

```
endstream
```

```
endobj
```

```
9 0 obj
```

```
<</ProcSet[
```

```
  /PDF/Text]
```

```
  /Font <</F1 4 0 R>>
```

```
  /XObject
```

```
>>/AdobeLogo 7 0 R >>
```

## Two Page Document (“Hello World” becomes “Page 1”, “Page 2”)



```
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
 [ 0.951  1  1.089]
>> ]

/CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
 [0.951  1  1.089]
>> ] >>
>>
endobj
```

```
4 0 obj
<<
 /Type /Font
 /Subtype /Type1
 /Name /F1
 /BaseFont/Helvetica
>>
endobj
```

```
6 0 obj
<<
 /Type /Catalog
 /Pages 5 0 R
>>
endobj
```





Hello World





## Annotations

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
  /Annots
    [7 0 R 8 0 R]
>>
endobj

2 0 obj
<< /Length 51 >>
stream
  BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  (Hello World)Tj
  ET
endstream
endobj
```

```
7 0 obj
<<
  /Type /Annot
  /Subtype /Text
  /Rect
    [332 614 494 766]
  /Open false
  /Contents (A second
annotation.)
  /M
    (D:19971020235937)
  /C [0 1 0]
  /T (Joe Doe -Adobe)
>>
endobj
```

```
8 0 obj
<<
  /Type /Annot
  /Subtype /Text
  /Rect
    [32 414 174 566]
  /Open true
  /Contents (An
annotation on the
Hello World page.)
  /M
    (D:19971020235937)
  /C [0 0 0.8]
  /T (Jim King-Adobe)
>>
endobj
```



## Annotations

```
3 0 obj
<</ProcSet[
  /PDF/Text]
  /Font <</F1 4 0 R>>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ] >>
endobj


6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj
```

```
trailer
<<
  /Root 6 0 R
>>
```

Hello World



## Link to Another View



```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
  /Annots [7 0 R]
>>
endobj

2 0 obj
<< /Length 51 >>
stream
BT
  /F1 24 Tf
  1 0 0 1 260 600 Tm
  (Hello World)Tj
ET
endstream
endobj
```

```
7 0 obj
<<
  /Type /Annot
  /Subtype /Link
  /Rect
    [248 572 396 642]
  /A 10 0 R
  /Border [0 0 1]
  /C [0 0.5 0.0691]
  /InvisibleRect /I
>>
endobj

10 0 obj
<<
  /S /GoTo
  /D [1 0 R /FitH 650]
>>
endobj
```

```
3 0 obj
<</ProcSet[
  /PDF/Text]
  /Font <</F1 4 0 R>>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```



```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ] >>
endobj
```

```
6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj
```



Page 1

Page 2

Page 3



## Table of Contents (Bookmarks)

```
%PDF-1.2
6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
  /Outlines 14 0 R
  /PageMode
    /UseOutlines
>>
endobj

5 0 obj
<<
  /Type /Pages
  /Kids
    [ 1 0 R 8 0 R
      11 0 R ]
  /Count 3
  /MediaBox
    [ 0 0 612 792 ] >>
endobj
```

```
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<< /Length 65 >>
stream
  BT
    /F1 1 Tf
    24 0 0 24
      260 500 Tm
    /CS1 cs
    0 0 1 sc
    (Page 1)Tj
  ET
endstream
endobj
```

```
3 0 obj
<</ProcSet[
  /PDF/Text]
  /Font <</F1 4 0 R>>
  /ColorSpace
  <</CS1 [ /Lab <<
    /Range
    [-128 127 -128 127]
    /WhitePoint
    [ 0.951 1 1.089]
    >> ] >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

## Table of Contents (Bookmarks)

### 8 0 obj

```
<<  
  /Type /Page  
  /Parent 5 0 R  
  /Resources 10 0 R  
  /Contents 9 0 R
```

```
>>  
endobj
```

### 9 0 obj

```
<< /Length 70 >>  
stream  
  BT  
  /F1 1 Tf  
  24 0 0 24  
    260 500 Tm
```

```
  /CS1 cs  
  63 127 127 sc  
  (Page 2)Tj  
  ET  
endstream  
endobj
```

### 10 0 obj

```
<</ProcSet[  
  /PDF/Text]  
  /Font <</F1 4 0 R>>  
  /ColorSpace  
  <</CS1 [ /Lab <<  
  /Range  
  [-128 127 -128 127]  
  /WhitePoint  
  [ 0.951 1 1.089]  
  >> ] >>
```

```
>>  
endobj
```

### 11 0 obj

```
<<  
  /Type /Page  
  /Parent 5 0 R  
  /Resources 13 0 R  
  /Contents 12 0 R
```

```
>>  
endobj
```

### 12 0 obj

```
<< /Length 52 >>  
stream  
  BT  
  /F1 24 Tf  
  1 0 0 1  
    260 500 Tm  
  0.5 g  
  (Page 3)Tj  
  ET  
endstream  
endobj
```

### 13 0 obj

```
<</ProcSet[  
  /PDF/Text]  
  /Font <</F1 4 0 R>>  
>>  
endobj
```



## Table of Contents (Bookmarks)

14 0 obj

<<

/Count 7

/Type /Outlines

/First 16 0 R

/Last 22 0 R

>>

endobj

15 0 obj

<<

/S /GoTo

/D [1 0 R

/FitR

-5 401 469 797]

>>

endobj

16 0 obj

<<

/Title (BookM 1)

/Parent 14 0 R

/A 15 0 R

/Next 28 0 R

/First 24 0 R

/Last 26 0 R

/Count 2

>>

endobj

18 0 obj

<<

/Title (Top of Page)

/A 29 0 R

/Parent 22 0 R

/Next 20 0 R

>>

endobj

19 0 obj

<<

/S /GoTo

/D [ 11 0 R

/FitR

-5 -5 469 391]

>>

endobj

20 0 obj

<<

/Title (Bottom of  
Page)

/A 19 0 R

/Prev 18 0 R

/Parent 22 0 R

>>

endobj



## Table of Contents (Bookmarks)

21 0 obj

<<

/S /GoTo

/D [ 11 0 R

/FitR

-5 401 469 797]

>>

endobj

22 0 obj

<<

/Title (BookM 3)

/Prev 28 0 R

/Parent 14 0 R

/A 21 0 R

/First 18 0 R

/Last 20 0 R

/Count 2

>>

endobj

23 0 obj

<<

/S /GoTo

/D [ 1 0 R

/FitR

-5 401 469 797]

>>

endobj

24 0 obj

<<

/Title (Top of  
Page 1)

/A 23 0 R

/Parent 16 0 R

/Next 26 0 R

>>

endobj

25 0 obj

<<

/S /GoTo

/D [ 1 0 R

/FitR

-5 -5 469 391]

>>

endobj

26 0 obj

<<

/Title (Bottom of  
Page 1)

/A 25 0 R

/Prev 24 0 R

/Parent 16 0 R

>>

endobj

## Table of Contents (Bookmarks)



```
27 0 obj
<<
  /S /GoTo
  /D [ 8 0 R /Fit ]
>>
endobj
```

```
28 0 obj
<<
  /Title (BookM 2)
  /Next 22 0 R
  /Prev 16 0 R
  /Parent 14 0 R
  /A 27 0 R
>>
endobj
```

```
29 0 obj
<<
  /S /GoTo
  /D [ 11 0 R
      /FitR
      -5 401 469 797]
>>
endobj
```

```
trailer
<<
  /Root 6 0 R
>>
```



Page 1

Page 2

Page 3

## Thumbnails for three pages

```
%PDF-1.2
6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
  /PageMode
    /UseThumbs
>>
endobj

5 0 obj
<<
  /Type /Pages
  /Kids
    [1 0 R   8 0 R
     11 0 R]
  /Count 3
  /MediaBox
    [ 0 0 612 792 ] >>
endobj
```

```
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
  /Thumb 32 0 R
>>
endobj

2 0 obj
<< /Length 65 >>
stream
BT
  /F1 1 Tf
  24 0 0 24
    260 500 Tm
  /CS1 cs
  0 0 1 sc
  (Page 1)Tj
ET
endstream
endobj
```

```
3 0 obj
<</ProcSet[/PDF/Text]
  /Font <</F1 4 0 R>>
  /ColorSpace
    <</CS1 [ /CalRGB <<
      /Gamma
        [2.222 2.222 2.222]
      /Matrix
        [0.412 0.213 0.019
          0.358 0.715 0.119
          0.181 0.072 0.951 ]
      /WhitePoint
        [0.951 1 1.089]
    >> ] >> >>
endobj

4 0 obj
<< /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

## Thumbnails for three pages



```
8 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 10 0 R
  /Contents 9 0 R
  /Thumb 34 0 R
>>
endobj

9 0 obj
<< /Length 70 >>
stream
BT
  /F1 1 Tf
  24 0 0 24
          260 500 Tm
  /CS1 cs
  63 127 127 sc
  (Page 2)Tj
ET
endstream
endobj
```

```
10 0 obj
<</ProcSet[
  /PDF/Text]
  /Font <</F1 4 0 R>>
  /ColorSpace
  <</CS1 [ /Lab <<
  /Range
  [-128 127 -128 127]
  /WhitePoint
  [ 0.951 1 1.089]
  >> ] >>
>>
endobj

11 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 13 0 R
  /Contents 12 0 R
  /Thumb 36 0 R
>>
endobj
```

```
12 0 obj
<< /Length 52 >>
stream
BT
  /F1 24 Tf
  1 0 0 1
          260 500 Tm
  0.5 g
  (Page 3)Tj
ET
endstream
endobj

13 0 obj
<</ProcSet[
  /PDF/Text]
  /Font <</F1 4 0 R>>
>>
endobj
```



## Thumbnails for three pages

```

17 1 obj
  [/Indexed
    /DeviceRGB 255
    30 0 R]
endobj

30 0 obj
<<
  /Filter
    [ /ASCII85Decode
      /LZWDecode ]
  /Length 31 0 R
>>
stream
J3Vsg-
=dE=!]*rE$,8^$P%cq&s
2<M1)A)g_ ;FLE.V90YKVi
0lQu")JAqHGDK%I>T
(1r<<hr?[Ec42X`N8\8+C
c21lJq,!%#Y5"4!2)V%&\
1TdK$8hN1 ; \,M1/Sgc:a#
,I

```

```

XEqE*O]NqC>.gl ; . $mr4&
UC0U3B2pk- ]s4-
!\k[h7OF@UeS[T%S '^2[b
2mY(At*)p
ph9 ; 04Z8Ho , BaAmJlOFb:
o&/((-
Y_ZO\hf1WYCUr7ZpUl&PS
^dF%)<b15<5W>#@\?
PS?e"Y$XDkQ><StBk4eX7
$l.s* , 0NSGqbH7kYhsRif
Q")7eni$4ORk=c>n_W!KH
Ma
1Ule*'5[ml?ac(i3SeE$E
oSA>cDQlJSZam2.*:J1L+
]FY8slNV9'jtX8@!c[-
gSW3
l+cUY@#R&TURpeLmkRH15
AES!N&4-
OY'2<!LB# ; N" ]CFM.0I/C
.]EInO: `oAN("E\
&PrKD!"j/N( ]Y/0!?(qMY
Q5^D&^ld_8(%No,"U-

```

```

MPpQP[FL5^SL"s=@9E[c%
43W;X
bT]a^'\!E5OV.]~>
endstream
endobj

31 0 obj
544
endobj

32 0 obj
<<
  /Filter
    [ /ASCII85Decode
      /LZWDecode ]
  /Width 76
  /Height 99
  /ColorSpace 17 1 R
  /BitsPerComponent 8
  /Length 33 0 R
>>
stream

```

## Thumbnails for three pages



```
J,g]g3$]7K#D>EP:q1$o*
=mro@So+\<\5,H7Uo<*jE
<[.O@Wn[3@'nb-
^757;Rp>H
>q_R=AlC^cenm@9:1mM9j
S"!dTMT<$3[GQ$8"L'e:g
m?2PU\m)MMLAs/qZlp'af
Pj
VuiGZYZP^B4!g3;B=(iz<
kDqOh/Bf.DHAorf'R[o?>
ioWjnAY&^gM+`4=1jRLW!
YA
=M/6)*KQH#5Q~>
endstream
endobj
```

```
33 0 obj
212
endobj
```

```
34 0 obj
<<
  /Filter
```

```
[ /ASCII85Decode
  /LZWDecode ]
/Width 76
/Height 99
/ColorSpace 17 1 R
/BitsPerComponent 8
/Length 35 0 R
>>
stream
J,g]g3$]7K#D>EP:q1$o*
=mro@So+\<\5,H7Uo<*jE
<[.O@Wn[3@'nb-
^757;Rp>H
>q_R=AlC^cenm@9:1mM9j
S"!dTMT<$3[GQ$8"KbG:g
.-
/PQqPH_803T2Ll#4;LuXA
4]\gYYZP^B4!g3;B=(iz<
kDqOh/Bf.DHAorf'R[o?>
ioWjnAY&^gM+`4=1jRLW!
YA
=M/6)*KQH#5Q~>
endstream
```

```
endobj
```

```
35 0 obj
212
endobj
```

```
36 0 obj
<<
```

```
  /Filter
    [ /ASCII85Decode
      /LZWDecode ]
  /Width 76
  /Height 99
  /ColorSpace 17 1 R
  /BitsPerComponent 8
  /Length 37 0 R
>>
stream
J,g]g3$]7K#D>EP:q1$o*
=mro@So+\<\5,H7Uo<*jE
<[.O@Wn[3@'nb-
^757;Rp>H
```

## Thumbnails for three pages



```
>q_R=AlC^cenm@9:1mM9j
S"!dTMT<$3[GQ$8"MkMct
BE1K_D6*hP.TC!gc9N4b\
"C
Kd+3;YZP^B4!g3;B=(iZ<
kDqOh/Bf.DHAorf'R[o?>
ioWjnAY&^gM+`4=1jRLW!
YA
=M/6(<<3~>
endstream
endobj
```

```
37 0 obj
208
endobj

trailer
<<
/Root 6 0 R
>>
```



Name: \_\_\_\_\_

## Acrobat Forms



```
%PDF-1.2
1 0 obj
<<
/Type /Page
/Parent 6 0 R
/Resources 3 0 R
/Contents 2 0 R
/Annots 13 0 R
>>
endobj

2 0 obj
<< /Length 73 >>
stream
BT
/F1 24 Tf
1 0 0 1 50 500 Tm
0 g
(Name: _____
_____ )Tj
ET
endstream
endobj
```

```
13 0 obj
[ 5 0 R ]
endobj

5 0 obj
<<
/Type /Annot
/Subtype /Widget
/Rect
[ 125 501 451 522 ]
/F 4
/T (FullName)
/FT /Tx
/AP << /N 14 0 R >>
>>
endobj
```

```
14 0 obj
<<
/Length 64
/BBox [ 0 0 326 21 ]
/Resources
<</ProcSet [/PDF]>>
/MK
<<
/BC [ 0.2 0.2 1 ]
/BG [ 1 0.75 1 ]
>>
>>
stream
1 0.75 1 rg
0 0 326 21 re f
0.7 0.7 1 RG
1 w
0.5 0.5 325 20 re s
endstream
endobj
```



## Acrobat Forms

```
7 0 obj
<<
  /Fields [ 5 0 R ]
  /DR
    <</Font
      <</Helv 10 0 R>>
    >>
  /DA
    ( /Helv 0 Tf 0 g )
>>
endobj

10 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /Helv
  /BaseFont /Helvetica
>>
endobj
```

```
8 0 obj
<<
  /Type /Catalog
  /Pages 6 0 R
  /AcroForm 7 0 R
>>
endobj

3 0 obj
<<
  /ProcSet [ /PDF /Text ]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont /Helvetica
>>
endobj
```

```
6 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ]
>>
endobj

trailer
<<
  /Root 8 0 R
>>
```



Name: \_\_\_\_\_

## Acrobat Forms (filled in)



```
%PDF-1.2
1 0 obj
<<
/Type /Page
/Parent 6 0 R
/Resources 3 0 R
/Contents 2 0 R
/Annots 13 0 R
>>
endobj

2 0 obj
<< /Length 73 >>
stream
BT
/F1 24 Tf
1 0 0 1 50 500 Tm
0 g
(Name: _____
_____ )Tj
ET
endstream
endobj
```

```
13 0 obj
[ 5 0 R ]
endobj

5 0 obj
<<
/Type /Annot
/Subtype /Widget
/Rect
  [ 125 501 451 522 ]
/F 4
/T (FullName)
/FT /Tx
/AP << /N 14 0 R >>
/V (Jim King)
/MK <<
  /BC [0.2 0.2 1]
  /BG [1 0.75 1]>>
>>
endobj
```

```
14 0 obj
<<
/Length 160
/Subtype /Form
/BBox [ 0 0 326 21 ]
/Resources
<</ProcSet
  [/PDF/Text ]
  /Font <<
    /Helv 10 0 R >>
  >>
>>
stream
```

## Acrobat Forms (filled in)



```

1 0.75 1 rg
  0 0 326 21 re f
0.2 0.2 1 RG
  1 w
0.5 0.5 325 20 re s
/Tx BMC
q
  1 1 324 19 re W n
  BT
    /Helv 15.5708 Tf
    0 g
    1 0 0 1
      1 4.7232 Tm
    (Jim King) Tj
  ET
Q
EMC
endstream
endobj

```

```

7 0 obj
<<
  /Fields [ 5 0 R ]
  /DR
    <</Font
      <</Helv 10 0 R>>
    >>
  /DA
    (/Helv 0 Tf 0 g )
>>
endobj

10 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /Helv
  /BaseFont /Helvetica
>>
endobj

```

```

8 0 obj
<<
  /Type /Catalog
  /Pages 6 0 R
  /AcroForm 7 0 R
>>
endobj

3 0 obj
<<
  /ProcSet[/PDF /Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont /Helvetica
>>
endobj

```



```
6 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 792 ]
>>
endobj

trailer
<<
  /Root 8 0 R
>>
```



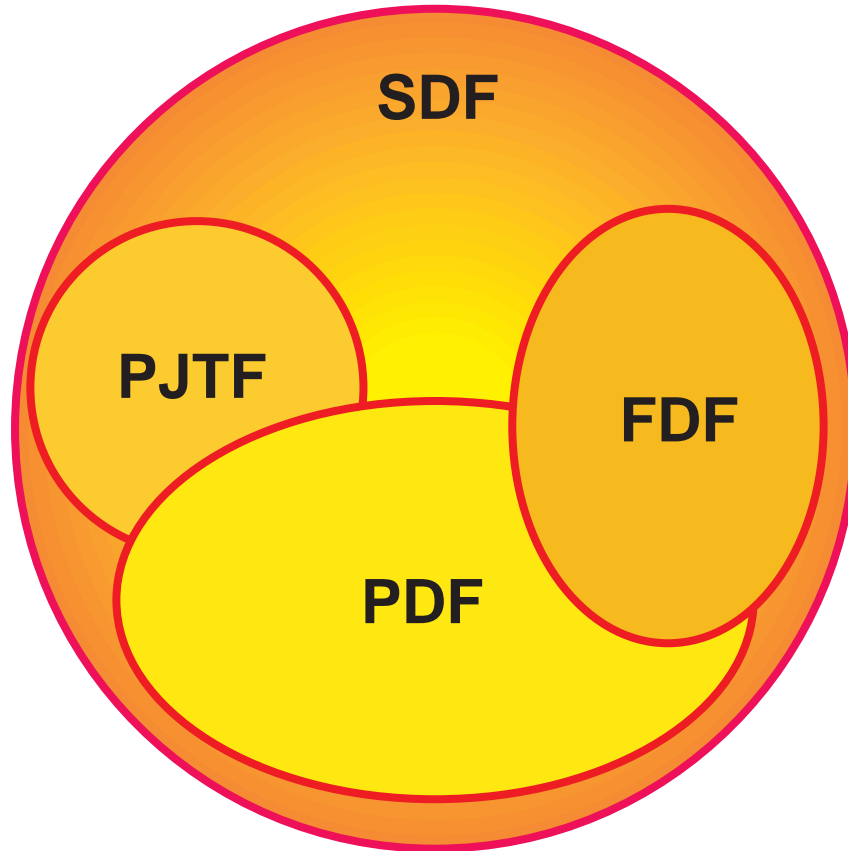
## FDF File for Example 20

```
%FDF-1.2
1 0 obj
<<
  /FDF
  <<
    /Fields [ << /V (Jim King) /T (FullName)>>
  ]
  /F (e20F.pdf)
  /ID [ ()() ]
  >>
>>
endobj

trailer
<<
/Root 1 0 R
>>
%%EOF
```



# Structured Data Format (SDF)





## Documentation on the WWW

Portable Document Format Language Reference Manual  
Version, Third Edition, Version 1.4 -- November 2001  
Published by Addison-Wesley, ISBN 0-201-75839-3

eBook version available from:

[http://partners.adobe.com/  
asn/developer/technotes/acrobatpdf.html](http://partners.adobe.com/asn/developer/technotes/acrobatpdf.html)

This presentation:

<http://kiosk.adobe.com/user/jking/pdftutorial/jcking00.pdf>

The examples:

<http://kiosk.adobe.com/user/jking/pdftutorial/jcking97.zip>



**Adobe**



```
3 0 obj
<<
  /ProcSet[/PDF/Text]
  /Font <</F1 4 0 R>>
  /ColorSpace
    <</CS1
      [ /Lab <<
        /Range [-128 127 -128 127]
        /WhitePoint [0.951 1 1.089]
      >>
    ]
  >>
>>
endobj
```



```
3 0 obj
<<
  /ProcSet[/PDF/Text]
  /Font <</F1 4 0 R>>
  /ColorSpace
  <</CS2
    [ /CalRGB <<
      /Gamma [2.222 2.222 2.222]
      /Matrix [0.412 0.213 0.019
                0.358 0.715 0.119
                0.181 0.072 0.951]
      /WhitePoint[0.951 1 1.089]
    >>
    ]
  >>
>>
endobj
```



```
/CS1 cs  
63 127 127 sc
```

```
1 0 0 1 315 490 cm
```

```
0 0 m
```

```
-7 23 -40 19 -15 -17 c  
-7.5 -27.8 -11 -22 0 -35 c  
11 -22 7.5 -27.8 15 -17 c  
40 19 7 23 0 0 c
```

```
b
```

```
endstream  
endobj
```

(0,792)

(612,792)



(315,572)

Y

(291,554)

(339,554)

(299,528)

(331,528)

X

(612,0)

0 0 1 rg

315 572 m

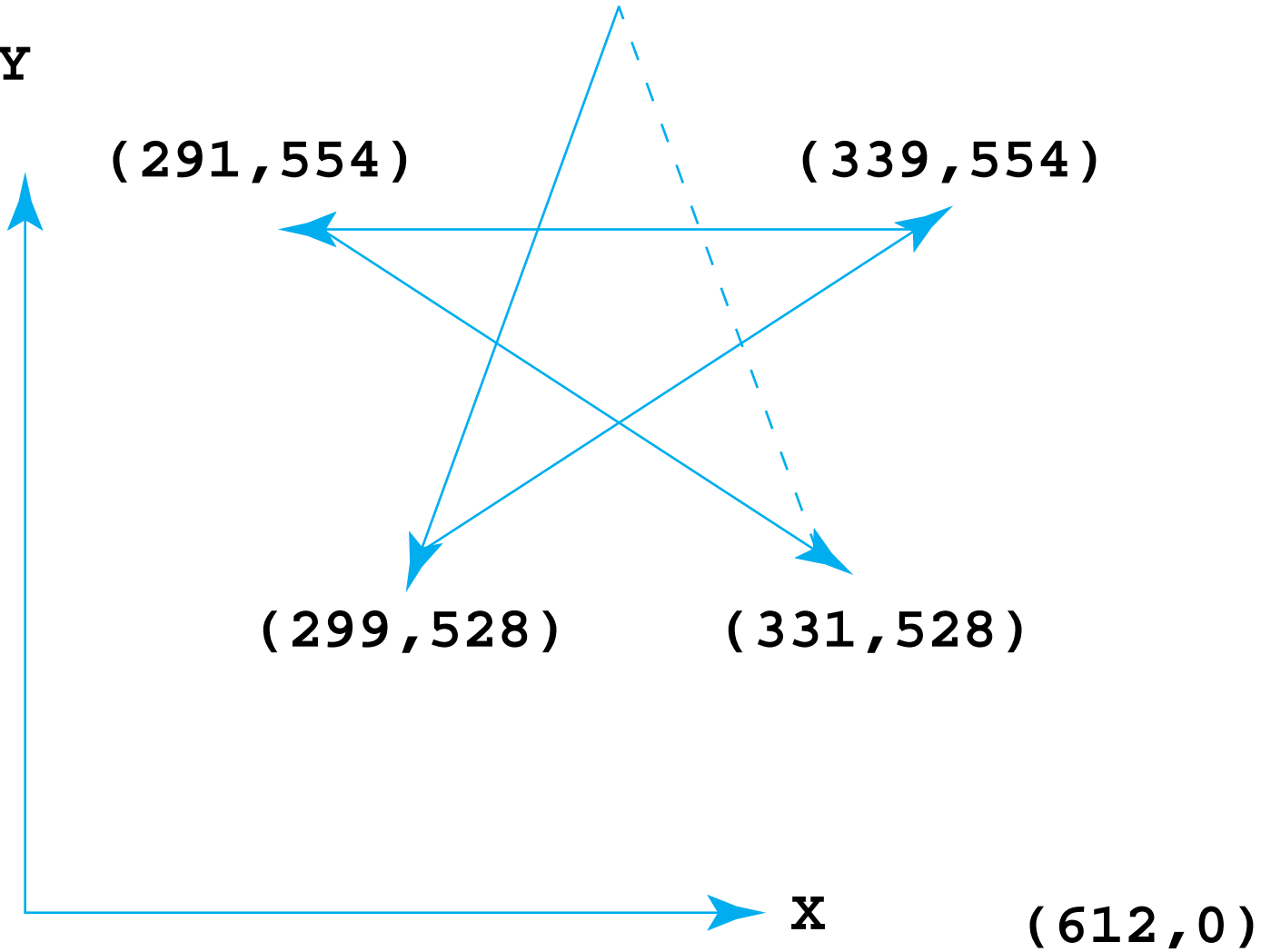
299 528 l

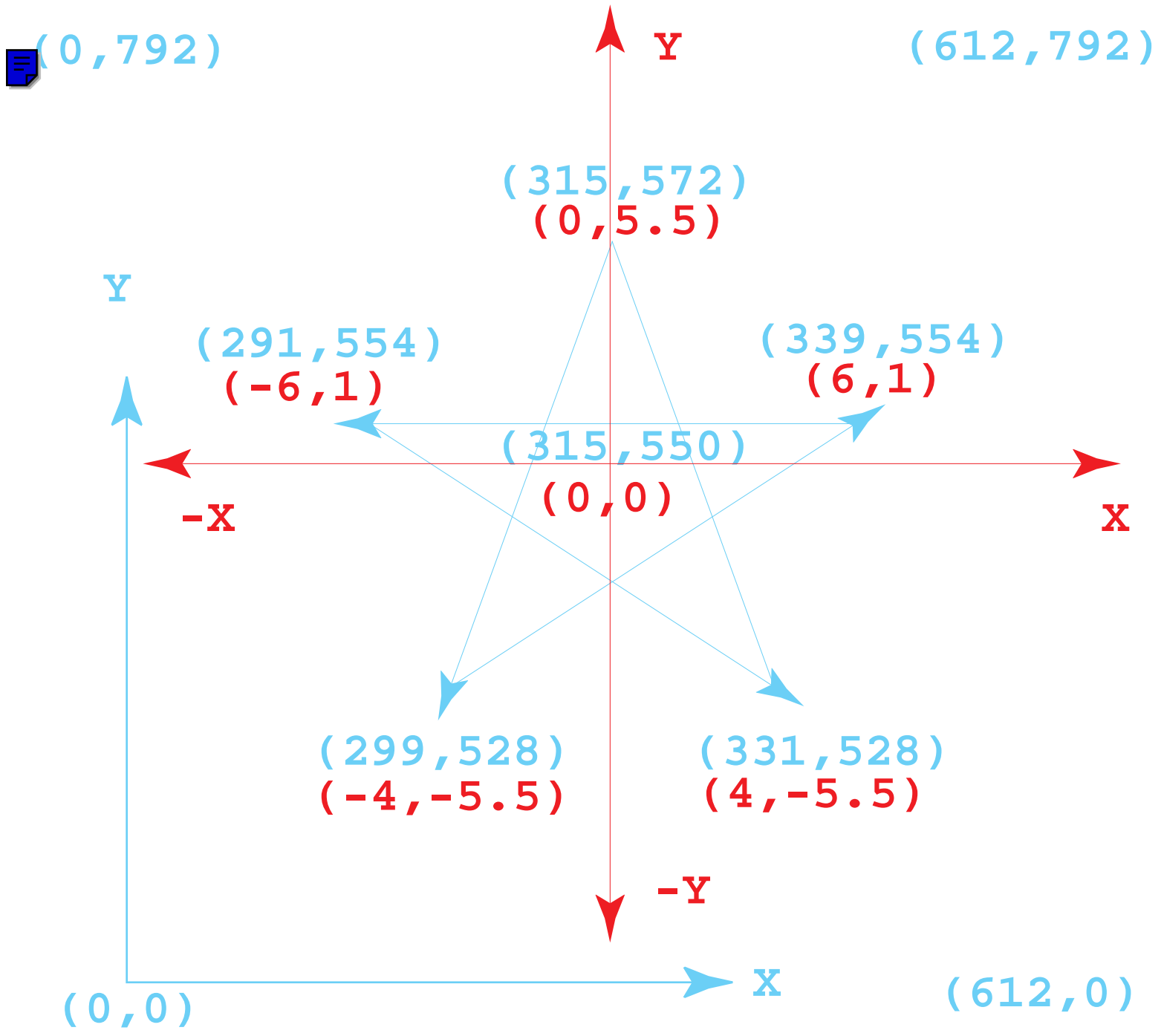
339 554 l

291 554 l

331 528 l

f



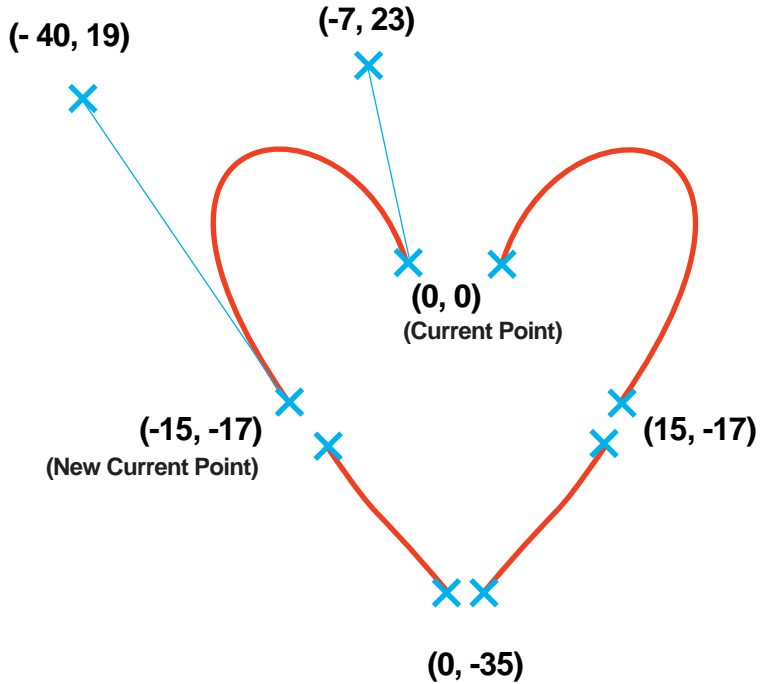


0 0 1 rg  
 315 572 m  
 299 528 l  
 339 554 l  
 291 554 l  
 331 528 l  
 f

4 0 0 4 315 550 cm  
 0 0 1 rg  
 0 5.5 m  
 -4 -5.5 l  
 6 1 l  
 -6 1 l  
 4 -5.5 l  
 f



# Bezier Curves

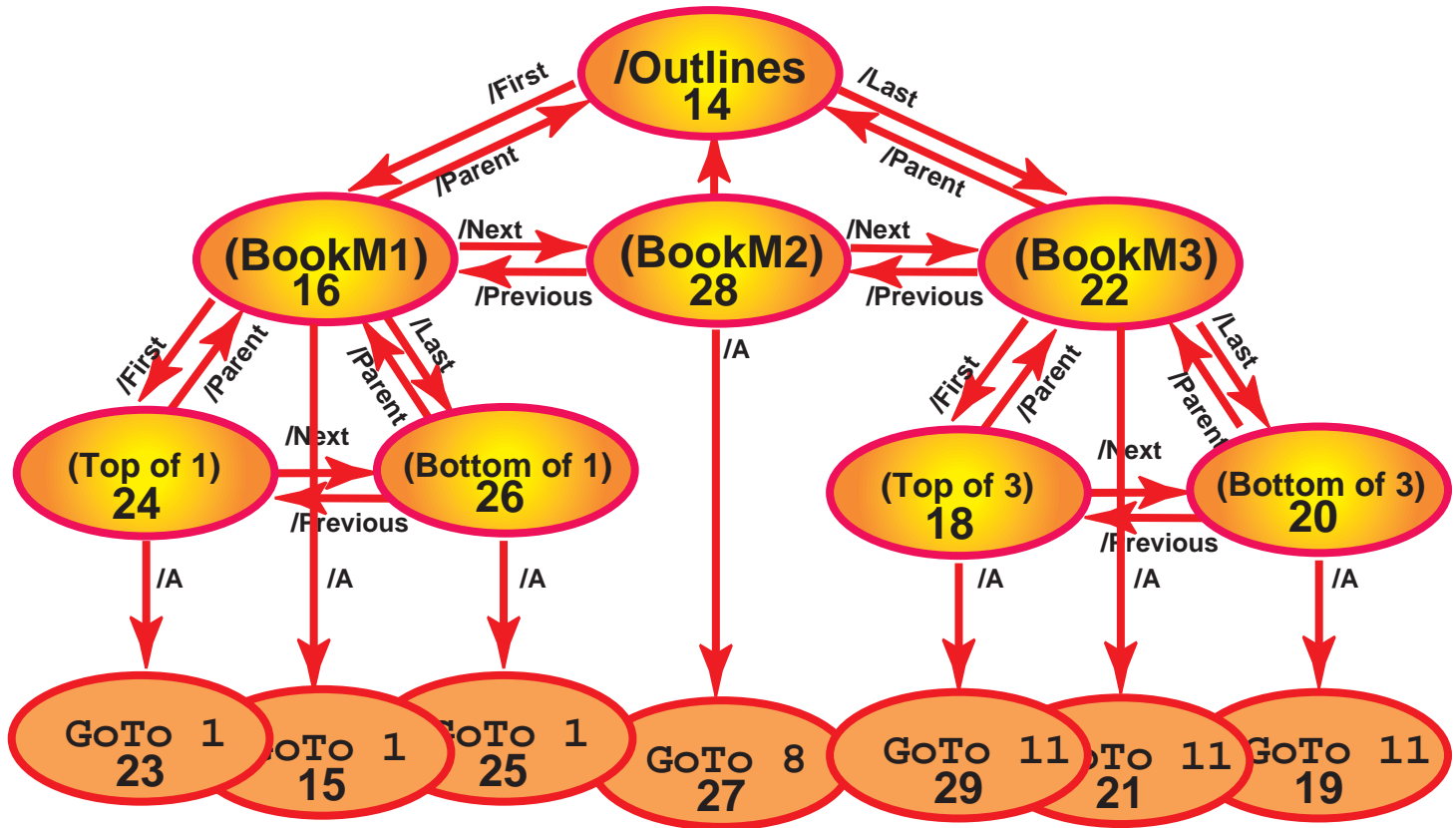


$x_1$   $y_1$   $x_2$   $y_2$   $x_3$   $y_3$   $c$

1 0 0 1 315 490 cm

0 0 m

-7	23	-40	19	-15	-17	c
-7.5	-27.8	-11	-22	0	-35	c
11	-22	7.5	-27.8	15	-17	c
40	19	7	23	0	0	c





**Adobe**