

things you might not have known about clipboards

(and some things I still don't understand)

Why do I care today?

Syntax highlighted code in slides.

X has multiple selection buffers

primary: Highlight / middle click

clipboard: Ctrl+C / Ctrl+V

xclip -selection clipboard

Browsers are especially cursed

Pasting an image into a Linux
browser can freeze it?



Drafts



Everyone 



 Everyone can reply



B

I



Post

Apple cross-device paste!

copy IBAN from phone's banking app

paste into web form on desktop

Lessons learned

OSes have multiple "clipboards"

X: primary, clipboard

macOS: general, drag, etc.

Lessons learned

Clipboards can have multiple items:
(e.g. copy several files)

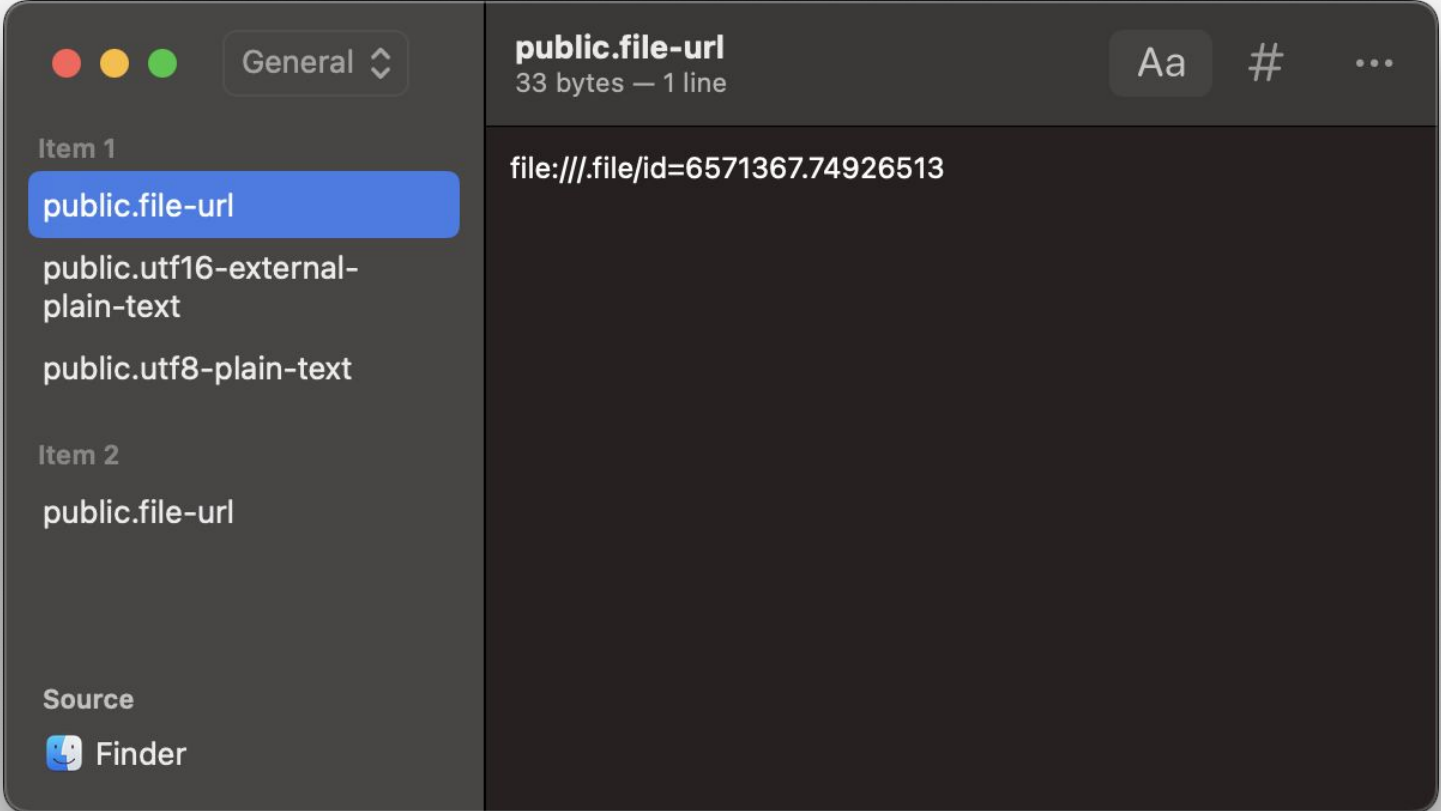
Lessons learned

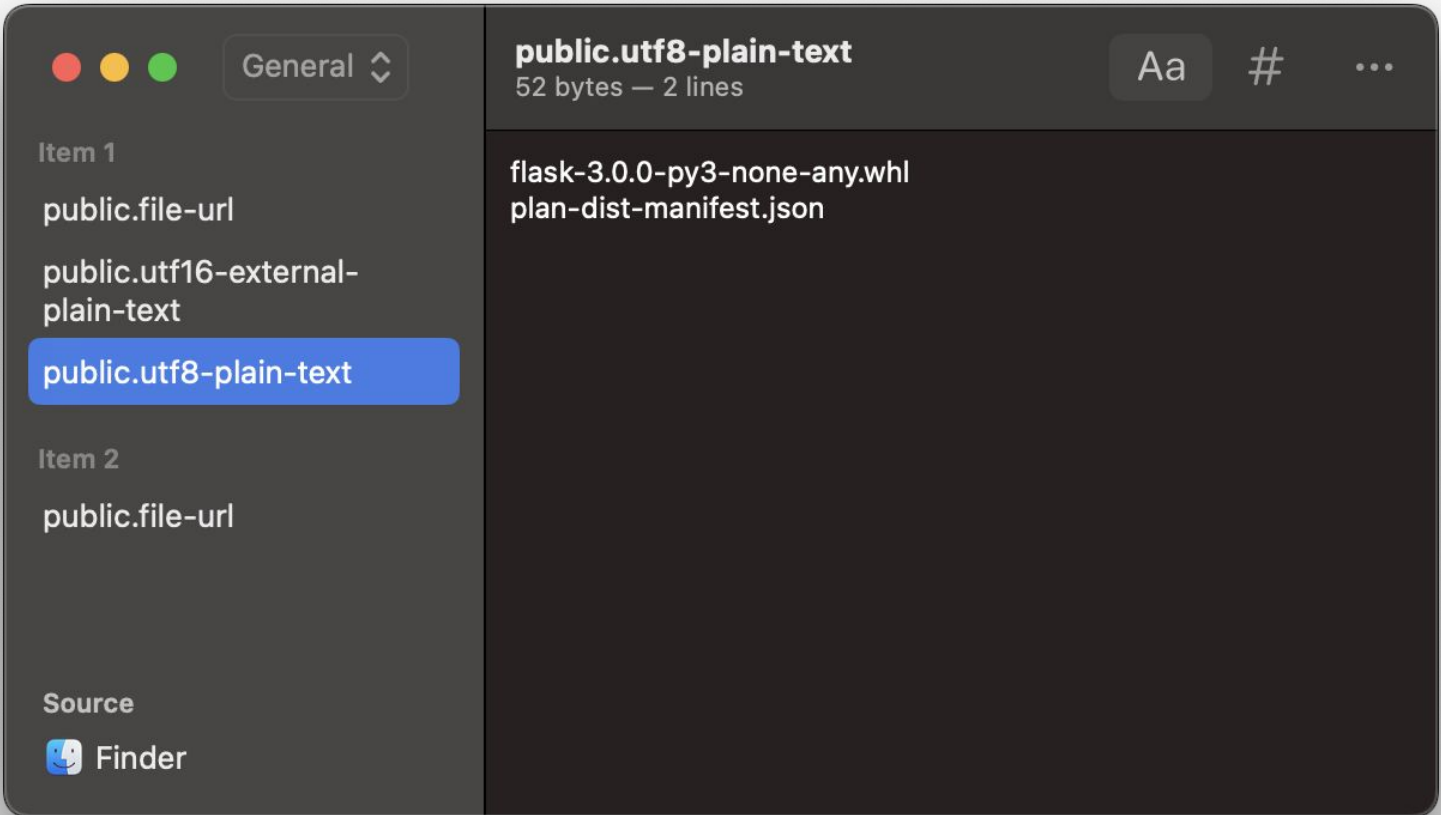
Items can have several formats!

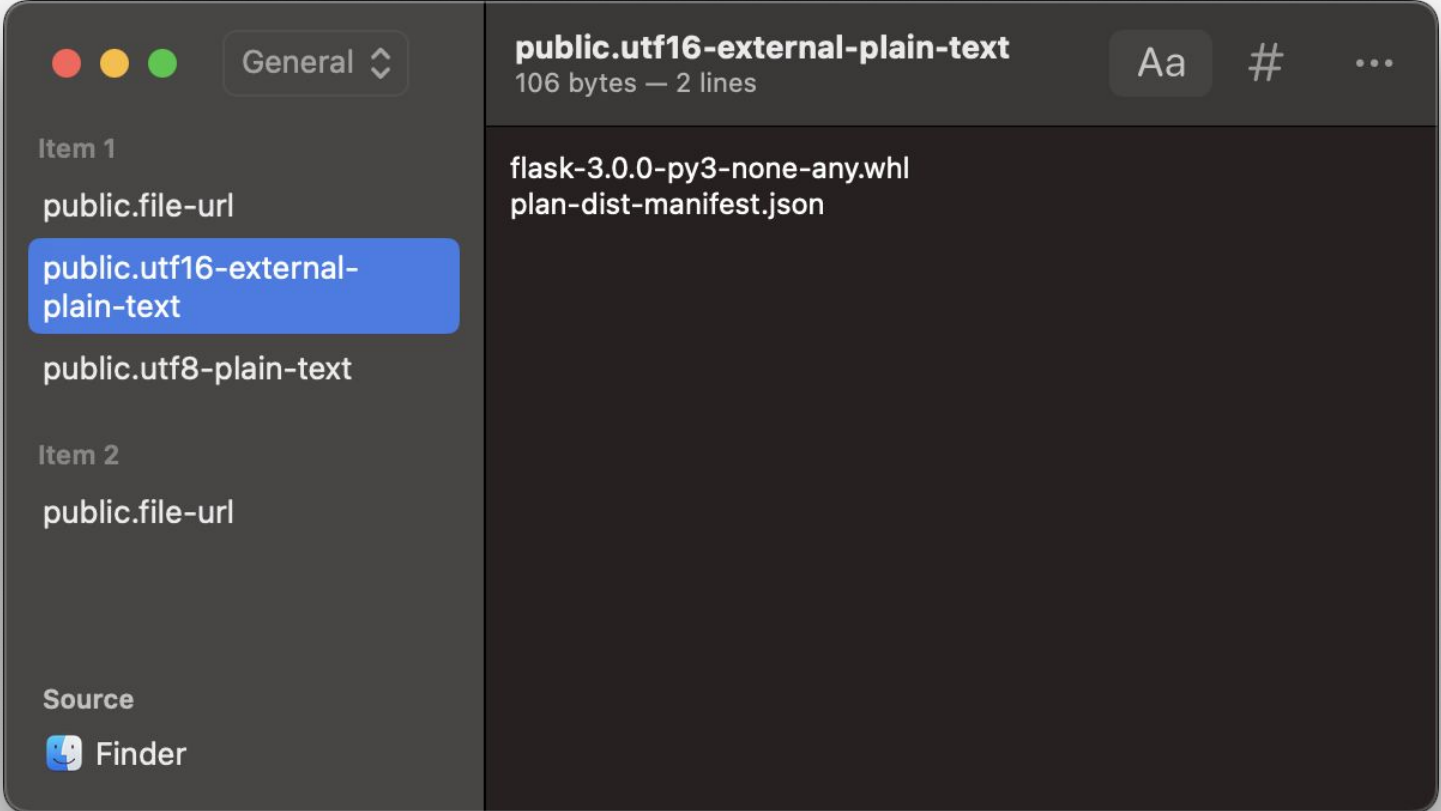
What's in the pasteboard...

...when you copy two files?

✨ ✨ [sindresorhus/Pasteboard-Viewer](#)

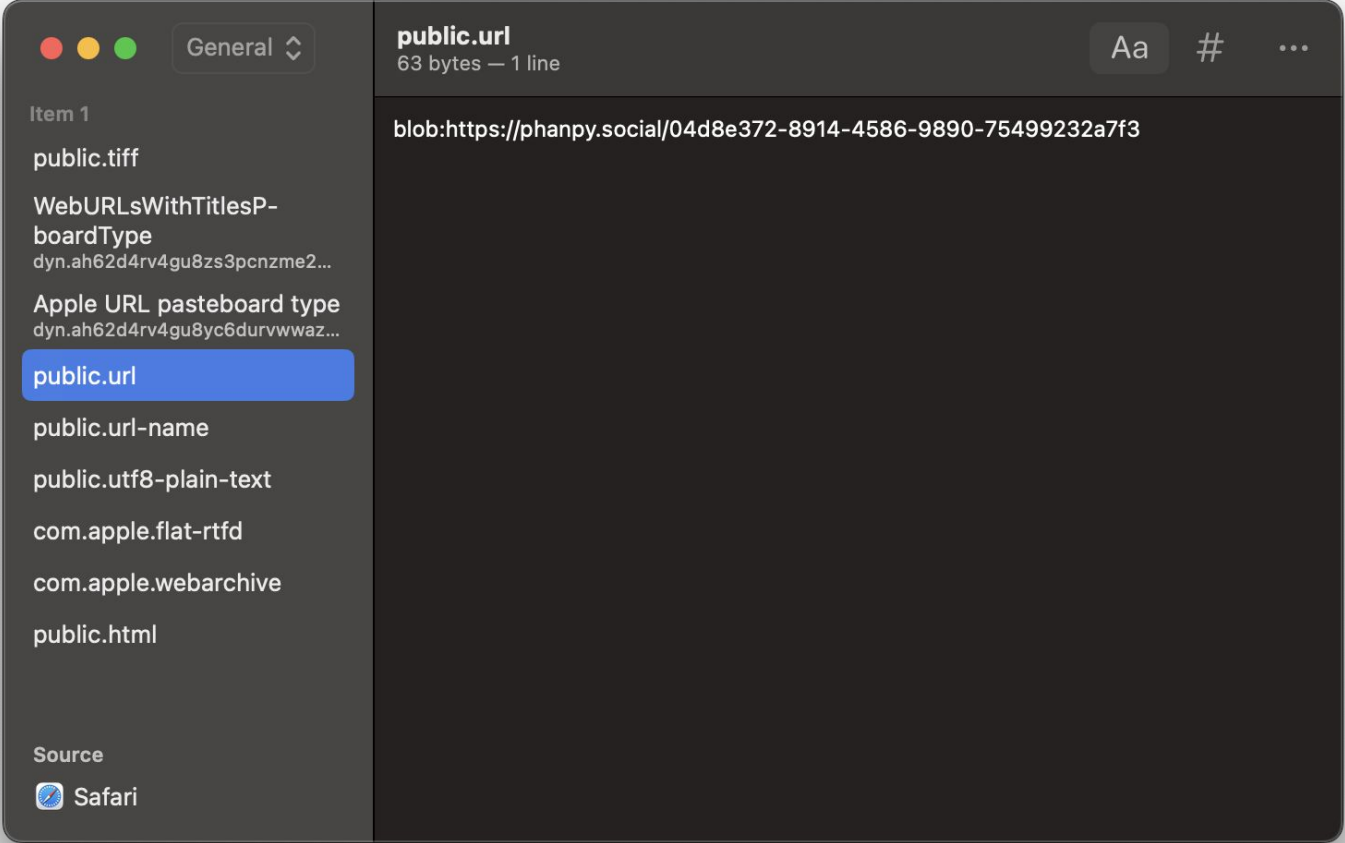


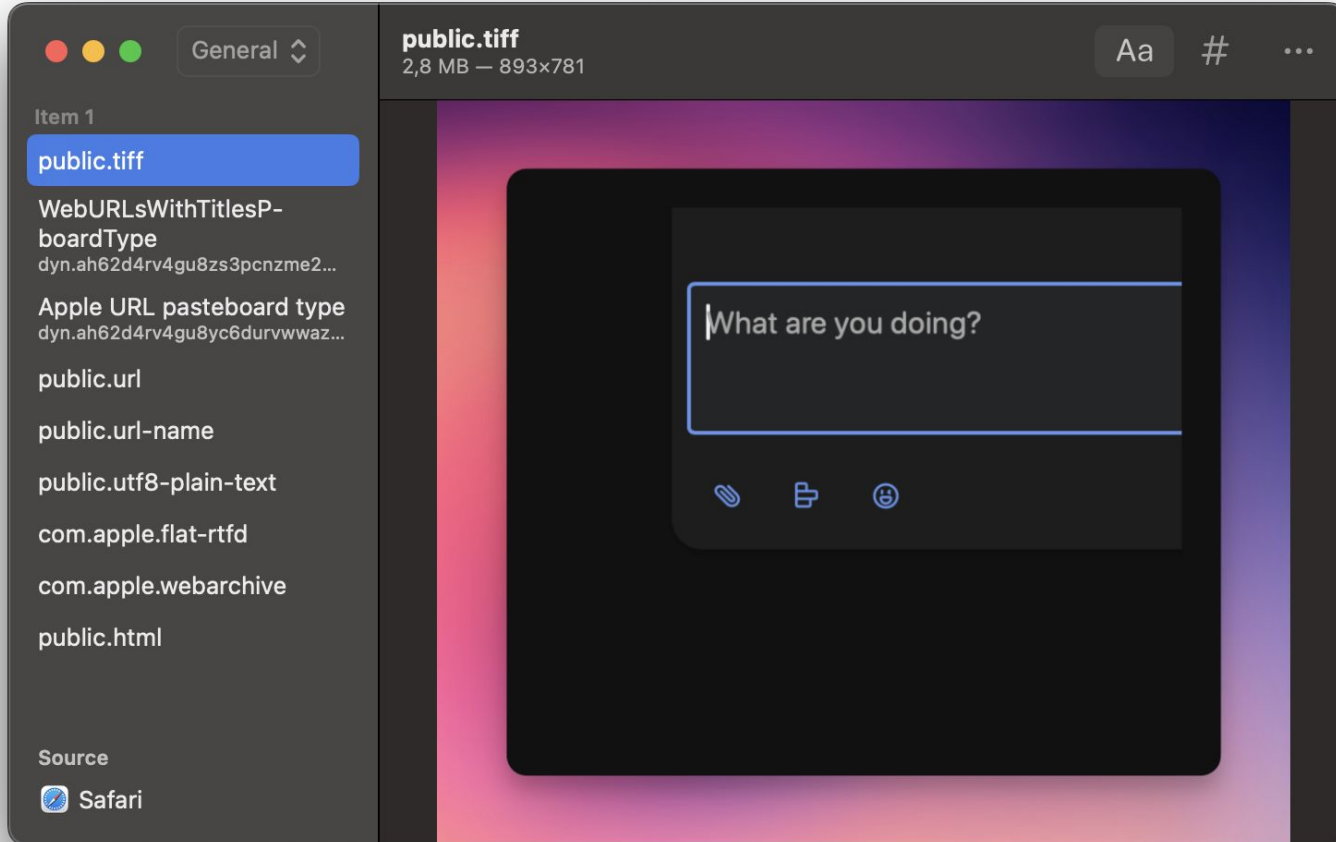


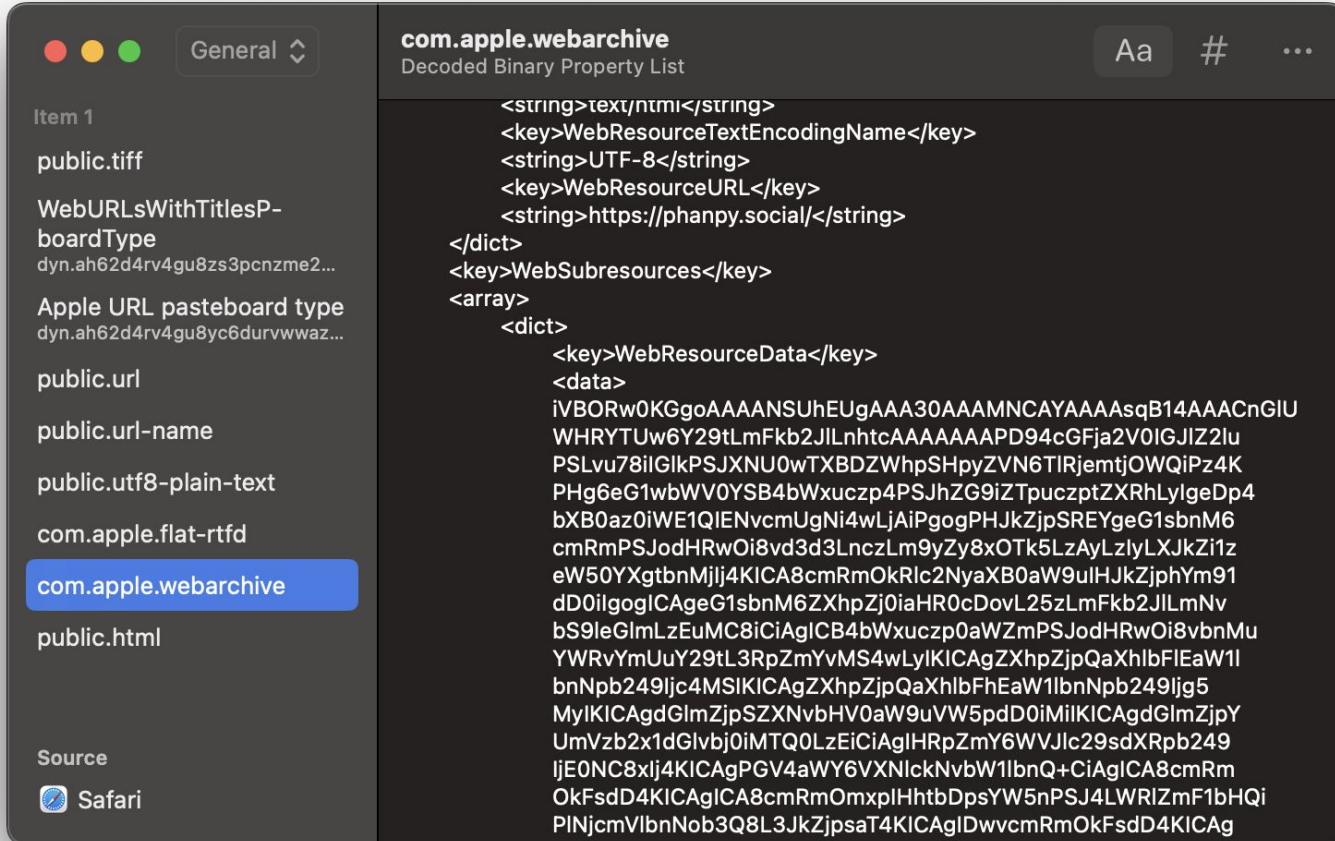


What's in the pasteboard...

...when you copy an image from Safari?








General

Item 1

- public.tiff
- WebURLsWithTitlesPasteboardType
dyn.ah62d4rv4gu8zs3pcnzme2...
- Apple URL pasteboard type
dyn.ah62d4rv4gu8yc6durvwaz...
- public.url
- public.url-name
- public.utf8-plain-text
- com.apple.flat-rtfd
- com.apple.webarchive**
- public.html

Source

-  Safari

com.apple.webarchive

Decoded Binary Property List

```
<string>text/plain</string>
<key>WebResourceTextEncodingName</key>
<string>UTF-8</string>
<key>WebResourceURL</key>
<string>https://phanpy.social/</string>
</dict>
<key>WebSubresources</key>
<array>
  <dict>
    <key>WebResourceData</key>
    <data>
      iVBORw0KGgoAAAANSUhEUgAAA30AAAMNCAYAAAAsqB14AAACnGIU
      WHRYTUw6Y29tLmFkb2JLbhtcAAAAAAD94cGFja2V0IGJlZ2lu
      PSLvu78iGlkPSJXNU0wTXBDZWhpSHpyZVN6TIRjemtjOWQiPz4K
      PHG6eG1wbWV0YSB4bWxuczp4PSJhZG9iZTpuZ3RrLylgeDp4
      bXB0az0iWE1QIElNvcmluLjAiPogogPHJkZjpsREYgeG1sbnM6
      cmRmPSJodHRwOi8vd3d3LnczLm9yZy8xOTk5LzAyLzlyLXk1Zi
      eW50YXgtbnMjIj4KICA8cmRmOkRlc2NyaXB0aW9uIHJkZjphYm91
      dD0iIlgogICAgeG1sbnM6ZXhpZj0iaHR0cDovL25zLmFkb2JLbNv
      bS9leGlmLzEuMCM8iCiAgICB4bWxuczp0aWZmPSJodHRwOi8vbnMu
      YWRvYmUuUuY29tL3RpbmYvMS4wLylkICAgZXhpZjpwQaXhlfIEaW1l
      bnNpb249Ijc4MSIKICA8ZXhpZjpwQaXhlfFhEaW1lbnNpb249Ijg5
      MyIKICAgdGlmZjpsZXNvbHV0aW9uVW5pdD0iIlmIIKICAgdGlmZjpsY
      UmVzb2x1dGlvb29iMTQ0LzEiCiAgIHRpZmY6VWJlc29sdXRpb249
      IjE0NC8xIj4KICA8PGV4aWY6VXNlckNvbW1lbnQ+CjAgICAgICA8cmRm
      OkFsdD4KICA8cmRmOkRmOkRlc2NyaXB0aW9uPSJ4LWRWRIZmF1bHQi
      PINjcmVlbnNob3Q8L3JkZjpsaT4KICA8IEdwvcmRmOkFsdD4KICA
```

● ● ●

General ▾

com.apple.flat-rtfd

210297 bytes

Aa # ...

<p>Item 1</p> <p>public.tiff</p> <p>WebURLsWithTitlesP-boardType dyn.ah62d4rv4gu8zs3pcnzme2...</p> <p>Apple URL pasteboard type dyn.ah62d4rv4gu8yc6durvwaz...</p> <p>public.url</p> <p>public.url-name</p> <p>public.utf8-plain-text</p> <p style="background-color: #4a90e2; color: white; padding: 2px;">com.apple.flat-rtfd</p> <p>com.apple.webarchive</p> <p>public.html</p> <p>Source</p> <p> Safari</p>	<pre> 72 74 66 64 00 00 00 00 03 00 00 00 03 00 00 00 07 00 00 rtf 00 54 58 54 2E 72 74 66 01 00 00 00 2E 0B 00 00 00 75 6E TXT.rtf . un 6B 6E 6F 77 6E 2E 70 6E 67 A8 01 00 00 4E 00 00 00 48 33 known.png. N H3 03 00 01 00 00 00 A0 01 00 00 7B 5C 72 74 66 31 5C 61 6E . {\rtf1\an 73 69 5C 61 6E 73 69 63 70 67 31 32 35 32 5C 63 6F 63 6F si\ansicpg1252\coco 61 72 74 66 32 38 31 38 0A 5C 63 6F 63 6F 61 74 65 78 74 artf2818 \cocoatext 73 63 61 6C 69 6E 67 30 5C 63 6F 63 6F 61 70 6C 61 74 66 scaling0\cocoaplatf 6F 72 6D 30 7B 5C 66 6F 6E 74 74 62 6C 5C 66 30 5C 66 73 orm0{\fonttbl\fs 77 69 73 73 5C 66 63 68 61 72 73 65 74 30 20 48 65 6C 76 wiss\fcharset0 Helv 65 74 69 63 61 3B 7D 0A 7B 5C 63 6F 6C 6F 72 74 62 6C 3B etica;} {\colortbl; 5C 72 65 64 32 35 35 5C 67 72 65 65 6E 32 35 35 5C 62 6C \red255\green255\bl 75 65 32 35 35 3B 7D 0A 7B 5C 2A 5C 65 78 70 61 6E 64 65 ue255;} {*\expande 64 63 6F 6C 6F 72 74 62 6C 3B 3B 7D 0A 5C 70 61 72 64 5C dcolortbl;}; \pard\ 74 78 35 36 30 5C 74 78 31 31 32 30 5C 74 78 31 36 38 30 tx560\tx1120\tx1680 5C 74 78 32 32 34 30 5C 74 78 32 38 30 30 5C 74 78 33 33 \tx2240\tx2800\tx33 36 30 5C 74 78 33 39 32 30 5C 74 78 34 34 38 30 5C 74 78 60\tx3920\tx4480\tx 35 30 34 30 5C 74 78 35 36 30 30 5C 74 78 36 31 36 30 5C 5040\tx5600\tx6160\ 74 78 36 37 32 30 5C 70 61 72 64 69 67 68 74 65 6E 66 61 63 74 75 72 61 tx6720\pardirnatu 6C 5C 70 61 72 74 69 67 68 74 65 6E 66 61 63 74 6F 72 30 l\partightenfactor0 0A 0A 5C 66 30 5C 66 73 32 34 20 5C 63 66 30 20 7B 7B 5C \f0\fs24 \cf0 {\f 4E 65 58 54 47 72 61 70 68 69 63 20 75 6E 68 6E 6F 77 6E NeXTGraphic unknown 2E 70 6E 67 20 5C 77 69 64 74 68 38 39 33 30 20 5C 68 65 .png \width8930 \he 69 67 68 74 37 38 31 30 20 5C 61 70 70 6C 65 61 74 74 61 ight7810 \appleatta 63 68 6D 65 6E 74 70 61 64 64 69 6E 67 30 20 5C 61 70 70 chmentpadding0 \app 6C 65 65 6D 62 65 64 74 79 70 65 30 20 5C 61 70 70 6C 65 leembedtype0 \apple 61 71 63 0A 7D AC 7D 7D 01 00 00 00 46 00 00 00 02 00 00 aqc }.} F 00 07 00 00 00 54 58 54 2E 72 74 66 0B 00 00 00 75 6E 6B TXT.rtf unk </pre>
--	--

```
fn main() {  
    println!("hello, world!")  
}
```

For best results, copy from Safari with Keynote decks and from Chrome with Google Slides decks.



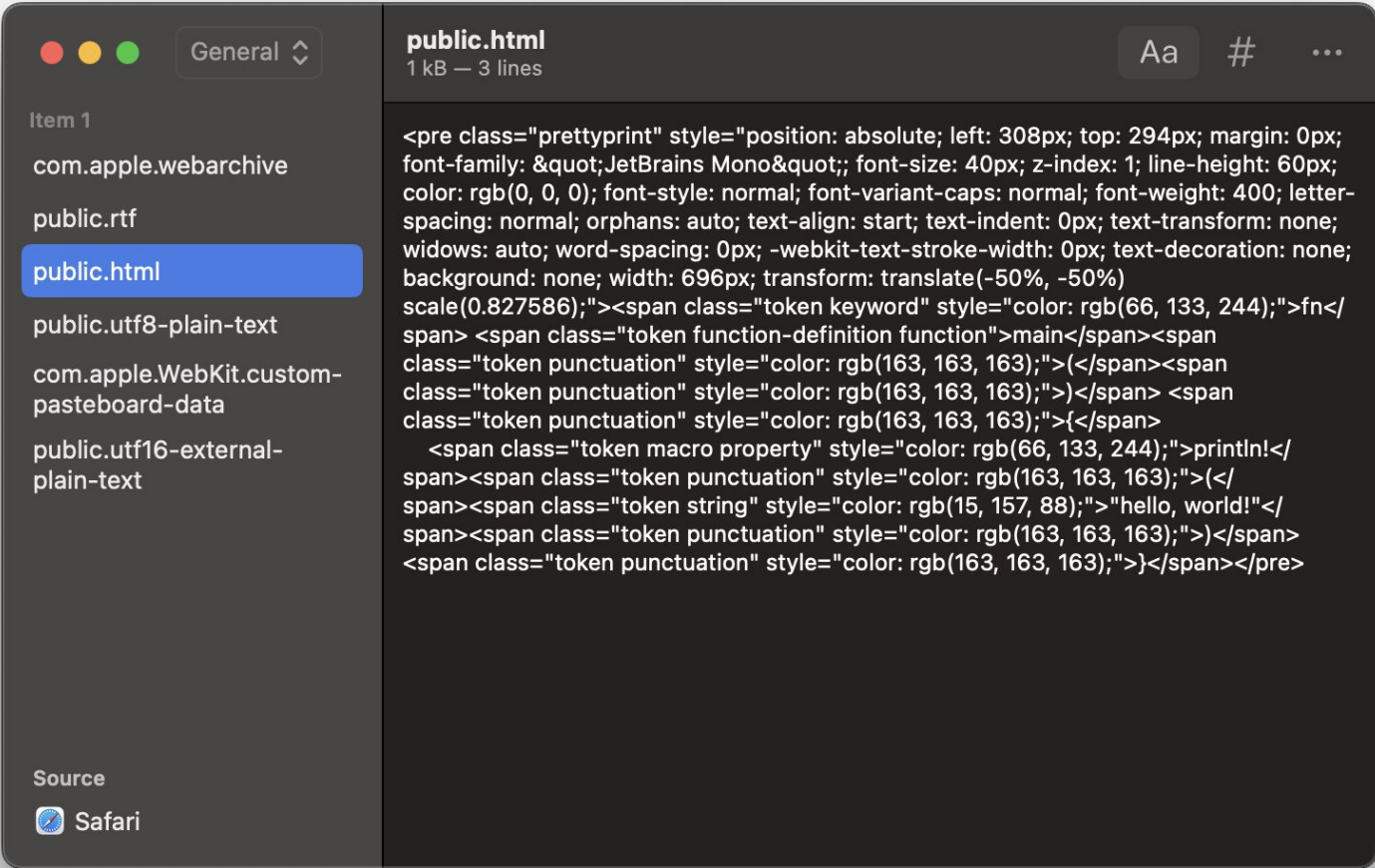
The image shows a code editor window with a dark theme. On the left is a sidebar with a file tree. The main area displays the content of the selected file, 'public.rtf', which contains a Go program. The code is as follows:

```
fn main() {  
    println!("hello, world!")  
}
```

The sidebar contains the following items:

- Item 1
 - com.apple.webarchive
 - public.rtf (highlighted)
 - public.html
 - public.utf8-plain-text
 - com.apple.WebKit.custom-pasteboard-data
 - public.utf16-external-plain-text

At the bottom of the sidebar, there is a 'Source' section with the Safari icon.



public.html
1 kB — 3 lines


General ▾

Item 1

- com.apple.webarchive
- public.rtf
- public.html**
- public.utf8-plain-text
- com.apple.WebKit.custom-pasteboard-data
- public.utf16-external-plain-text

```
<pre class="prettyprint" style="position: absolute; left: 308px; top: 294px; margin: 0px; font-family: &quot;JetBrains Mono&quot;; font-size: 40px; z-index: 1; line-height: 60px; color: rgb(0, 0, 0); font-style: normal; font-variant-caps: normal; font-weight: 400; letter-spacing: normal; orphans: auto; text-align: start; text-indent: 0px; text-transform: none; widows: auto; word-spacing: 0px; -webkit-text-stroke-width: 0px; text-decoration: none; background: none; width: 696px; transform: translate(-50%, -50%) scale(0.827586);"><span class="token keyword" style="color: rgb(66, 133, 244);">fn</span><span class="token function-definition function" style="color: rgb(66, 133, 244);">main</span><span class="token punctuation" style="color: rgb(163, 163, 163);">(</span><span class="token punctuation" style="color: rgb(163, 163, 163);">(</span><span class="token punctuation" style="color: rgb(163, 163, 163);">(</span><span class="token punctuation" style="color: rgb(163, 163, 163);">{</span><span class="token macro property" style="color: rgb(66, 133, 244);">println!</span><span class="token punctuation" style="color: rgb(163, 163, 163);">(</span><span class="token string" style="color: rgb(15, 157, 88);">"hello, world!"</span><span class="token punctuation" style="color: rgb(163, 163, 163);">)</span><span class="token punctuation" style="color: rgb(163, 163, 163);">)</span><span class="token punctuation" style="color: rgb(163, 163, 163);">)</span></pre>
```

Source

 Safari



● ● ●
General ▾

public.html
Aa # ...

1 kB — 3 lines

```

<meta charset='utf-8'><pre class="prettyprint" style="position: absolute; left: 308px;
top: 209.5px; margin: 0px; font-family: &quot;JetBrains Mono&quot;; font-size: 40px; z-
index: 1; line-height: 60px; color: rgb(0, 0, 0); font-style: normal; font-variant-ligatures:
normal; font-variant-caps: normal; font-weight: 400; letter-spacing: normal; orphans: 2;
text-align: start; text-indent: 0px; text-transform: none; widows: 2; word-spacing: 0px;
-webkit-text-stroke-width: 0px; background: transparent; text-decoration-thickness:
initial; text-decoration-style: initial; text-decoration-color: initial; width: 696px;
transform: translate(-50%, -50%) scale(0.827586);"><span class="token keyword"
style="color: rgb(66, 133, 244);">fn</span> <span class="token function-definition
function">main</span><span class="token punctuation" style="color: rgb(163, 163,
163);">(</span><span class="token punctuation" style="color: rgb(163, 163, 163);">)</
span> <span class="token punctuation" style="color: rgb(163, 163, 163);">{</span>
  <span class="token macro property" style="color: rgb(66, 133, 244);">println!</
span><span class="token punctuation" style="color: rgb(163, 163, 163);">(</
span><span class="token string" style="color: rgb(15, 157, 88);">"hello, world!"</
span><span class="token punctuation" style="color: rgb(163, 163, 163);">)</span>
<span class="token punctuation" style="color: rgb(163, 163, 163);">}</span></pre>

```

Item 1

- public.html
- public.utf8-plain-text
- org.chromium.source-url

Source

Google Chrome

```
@@ -12,21 +11,18 @@
    line-height: 60px;
    color: rgb(0, 0, 0);
    font-style: normal;
-   font-variant-ligatures: normal;
    font-variant-caps: normal;
    font-weight: 400;
    letter-spacing: normal;
-   orphans: 2;
+   orphans: auto;
    text-align: start;
    text-indent: 0px;
    text-transform: none;
-   widows: 2;
+   widows: auto;
    word-spacing: 0px;
    -webkit-text-stroke-width: 0px;
-   background: transparent;
-   text-decoration-thickness: initial;
-   text-decoration-style: initial;
-   text-decoration-color: initial;
+   text-decoration: none;
+   background: none;
    width: 696px;
    transform: translate(-50%, -50%) scale(0.827586);
"
```

(END)

But wait, there's more!

Copying rich text *from* browser (to other apps)

- Only one clipboard
- Can write multiple items
- Can write multiple formats per item

Chrome	Edge *	Safari	Firefox	Chrome for Android	Safari on iOS *	Samsung Internet	Opera Mobile *	UC Browser for Android
109					15.8			
126					16.7			
127	127				17.5			
128	128	17.5	129		17.6			
129	129	18.0	131	129	18.0	25	80	15.5
130		18.1	132		18.1			
131		TP	133					
132			134					

Status quo

	HTML+CSS	RTF	SVG
Safari			
Chrome			
Keynote			
Slides			

My way out?

Write to the clipboard *from the local server*

✨ ✨ [1password/arboard](#)