O(1) Navigation on the Web with "Custom Search Engines"
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I wish that Chrome had a better name for it but it's easy to create "search engines" that let you zip around to frequently used URLs. Here's a simple one of mine:

Here's the important part: If I go to the browser's address bar and type `ua  ENTER`, I go straight to the UA homepage. For me, that's four keystrokes: `cmd-L ua ENTER`. I call this *O(1) navigation*—no need to type an indefinite amount and then paddle up and down with the arrow keys looking for the right URL to pick with ENTER.

Here's a little more detail. First, note my URL: chrome://settings/searchEngines

Chrome doesn't label the three columns that are displayed:

- The first is some sort of description that you choose, perhaps used in conjunction with `cmd-F` or (`control-F`, on Windows) to search this page for a particular "search engine".

- Let's call the second column the "keyword", since Chrome and Opera use that term. The keyword here is `ua`.

- The third column is a URL, `http://www.arizona.edu/`

Here are some of the "search engines" I've got:

`pz`	Piazza
`pzr`	Resources page on Piazza
`lyah`	*Learn You a Haskell* on Safari
`cs`	`http://www.cs.arizona.edu/`
`352`	My old 352 stuff
`html5`	`http://www.w3.org/TR/html5/`
`vdi`	`http://validator.w3.org/#validate_by_input`
`fb`	`https://www.facebook.com/` ("*All work and no play...*")
`se`	`chrome://settings/searchEngines`, for making more of these!

To add a new search engine, just go to the bottom of the list and fill in the fields:

🗎 zappos.com	zappos.com	http://www.zappos.com/search?term=%s&gl...
🗎 ZZZ	zzz	http://the end
Add a new search engine	Keyword	URL with %s in place of query

Done

I've got a `zzz` entry there at the end, so I can type `cmd-F zzz` to quickly to the end. (Another example of O(1) navigation!) On the Mac, `fn RIGHT` *almost* works to go to the end of the search engine list.

Parameterized search engines

Note that third field, "URL with %s in place of query". The `%s` will look familiar to those who know Java's `System.out.format()` and C's `printf()`—it indicates a supplied string will be interpolated into the URL.

Here's a "search engine" that takes advantage of that interpolation.

```
372f http://www.cs.arizona.edu/classes/cs372/spring15/%s
```

If I want to bring up my second 372 assignment, I type `cmd-L 372f a2.pdf ENTER`. I could make that shorter, too, with `.../spring15/a%s.pdf` and then type only `cmd-L a 2`.

I think of URLs with `%s` as parameterized search engines. I've got lots of them. Here's one for the UA Phonebook:

```
uapb    http://directory.arizona.edu/phonebook?cn=%s
```

If I type `cmd-L uapb mitchell ENTER`, I see a bunch of people I am unrelated to.

When teaching 337 I used `pf` and `pt` for looking up PHP functions and PHP types:
```
pf      http://www.php.net/manual/en/function.%s.php
pt      http://www.php.net/manual/en/language.types.%s.php
```

`cmd-L gettype ENTER` shows me the documentation for the `gettype()` function and `cmd-L string ENTER` bring up an overview of the string type.

I also used `mh` and `mc` to bring up the MDN docs for HTML elements and CSS properties:
```
mh https://developer.mozilla.org/en-US/docs/Web/HTML/Element/%s
mc https://developer.mozilla.org/en-US/docs/Web/CSS/%s
```

I've got one named `jm` so that `cmd-L jira 934 ENTER` takes me straight to bug report 934 on a particular project.

I don't know what the stock Chrome configuration is but you might find that you've already got a Wikipedia search engine:

```
w       http://en.wikipedia.org/wiki/%s
```

Generalization

It'd be nice to have a hook to perform some arbitrary computation, so that something like

```
c 372 a2
```

would be viewed as a "class" command: Bring up assignment 2 from 372, just like you might do that at the shell with something like

```
$ open $(c 372 a2)
```

A browser-based approach might have a search engine for `c` that would pass the full line to a PHP program that does a redirect to a URL generated via whatever rules you want.

URL Design

If more software developers relied on this "search engine" facility we might see some smarter URL designs. Here's the URL for my D2L dropbox for assignment 2:

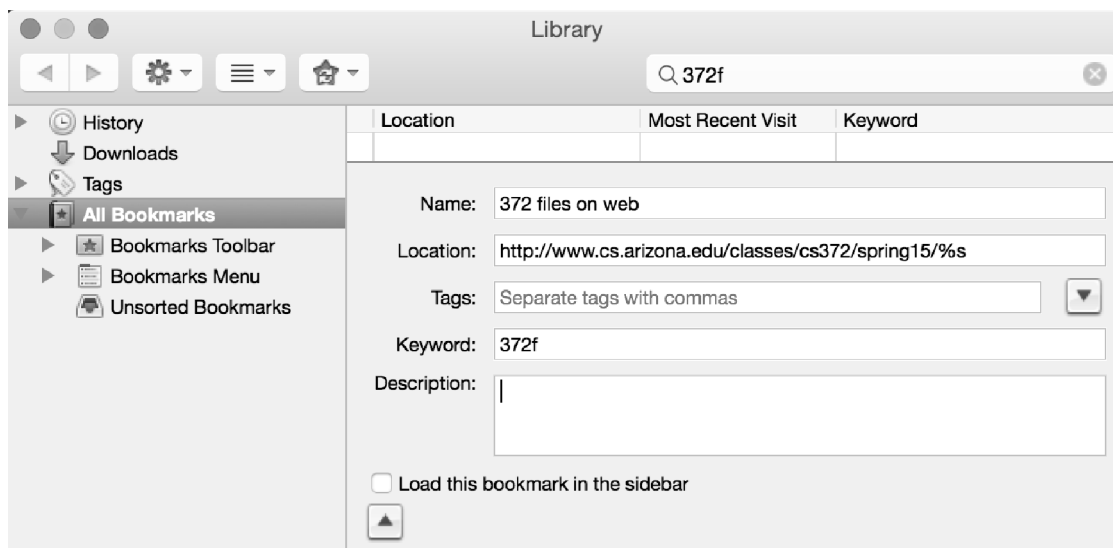   https://d2l.arizona.edu/d2l/lms/.../folder_submissions_users.d2l?db=986162&ou=391853

If instead of using a numeric id for the dropbox (`db=986162`) they used `db=a2`, I could have this search engine:

    db   https://d2l.arizona.edu/d2l/lms/.../folder_submissions_users.d2l?db=%s&ou=391853

Other browsers

I first discovered this facility in Opera, where a more sensible name was used: keywords. I haven't been using Opera lately so I won't fumble around with it here.

Firefox seems to use two terms: keywords and (maybe) Quick Searches. You can create a keyword in Firefox by bookmarking a page and then editing the properties. On the Mac it looks like this:

the above shows the view **after** clicking a [▼] to reveal the Keyword field.

Just now I found http://kb.mozillazine.org/Using_keyword_searches and discovered that Firefox supports both `%s` and `%S`. Maybe Chrome does as well. That page has links to other articles on this keyword/custom search engine facility, too.

I'd take a look and see what the situation is on Safari but the game developers at Apple have no doubt carried gamification like that seen in Yosemite's calendar interface into Safari, and I just don't have time to try to reach level 2 in Safari at present.

Shocker: Internet Exploder has no facility of this sort that I'm aware of. Let me know if there is one.