COMP4021
Internet Computing

HTML Forms

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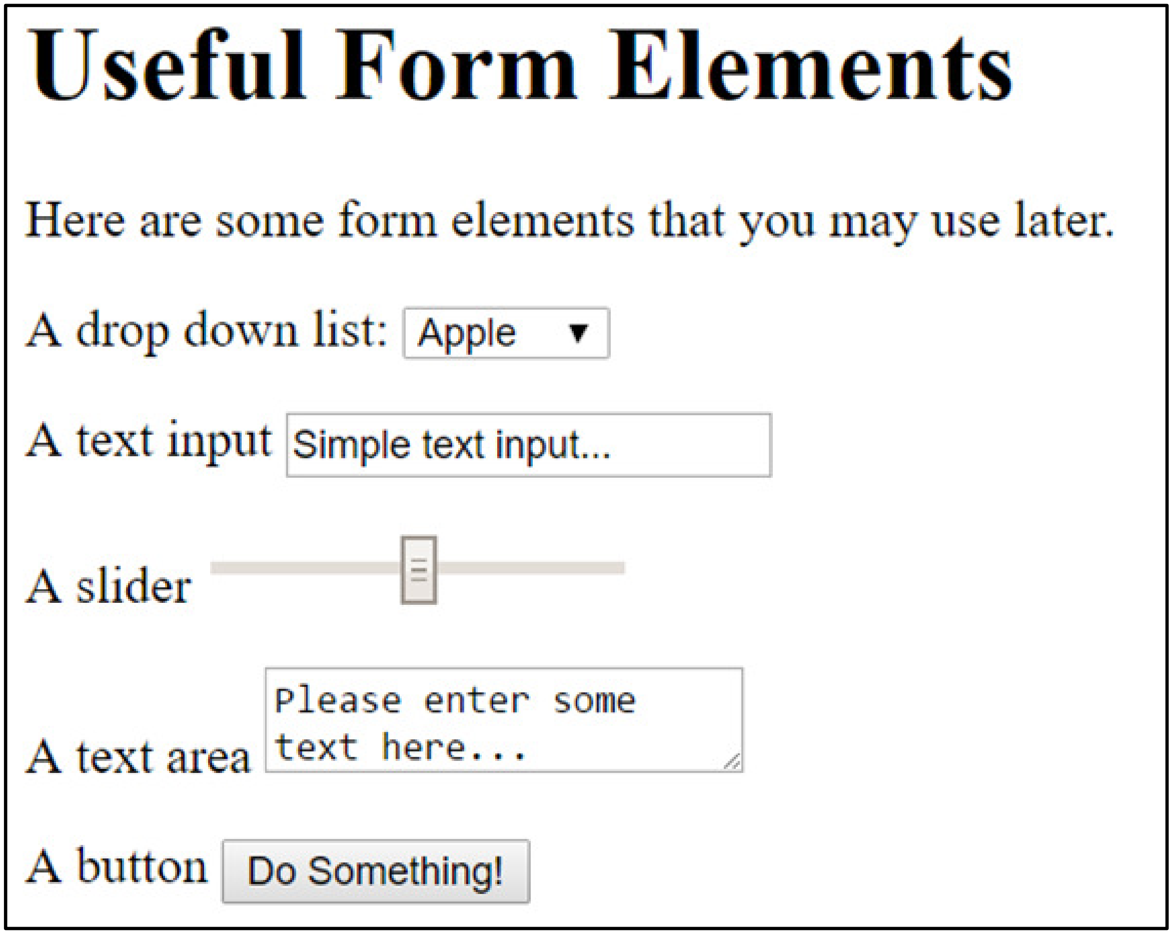
HTML Forms

- Using an HTML form is the most obvious way to send data from a browser to a server

- You put various input controls inside the form, such as text input boxes and sliders

An Example Form



Useful Form Elements

Here are some form elements that you may use later.

A drop down list: Apple ▼

A text input Simple text input...

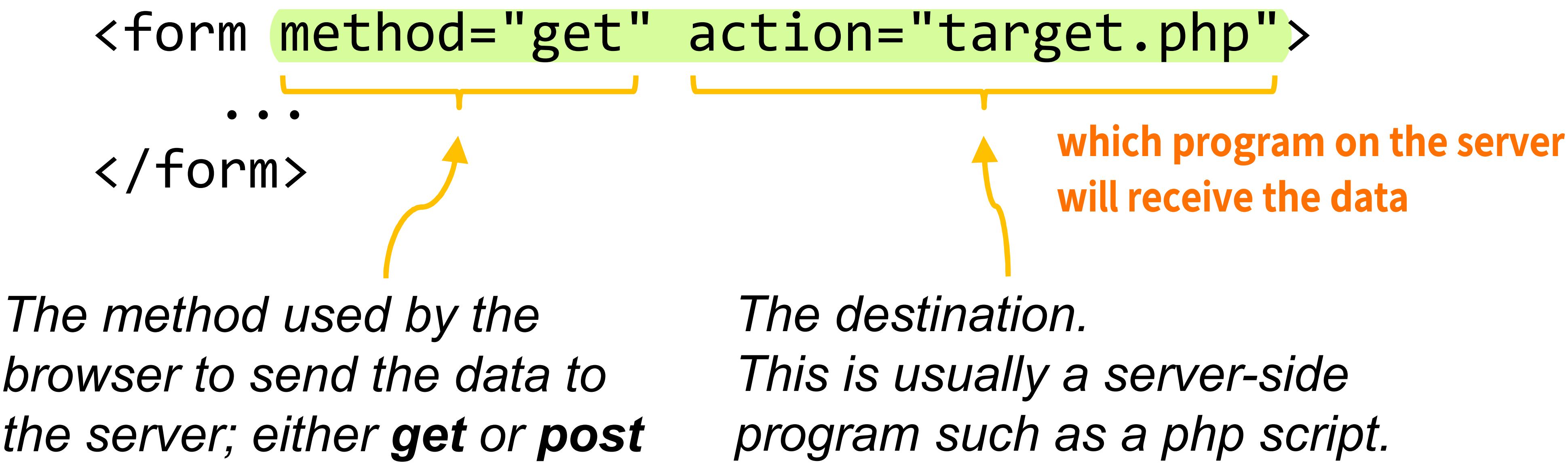
A slider

A text area Please enter some text here...

A button

An Example Form Tag

- Here is a simple `<form>` structure:



```
<form method="get" action="target.php">
      ...
</form>
```

which program on the server will receive the data

*The method used by the browser to send the data to the server; either **get** or **post***

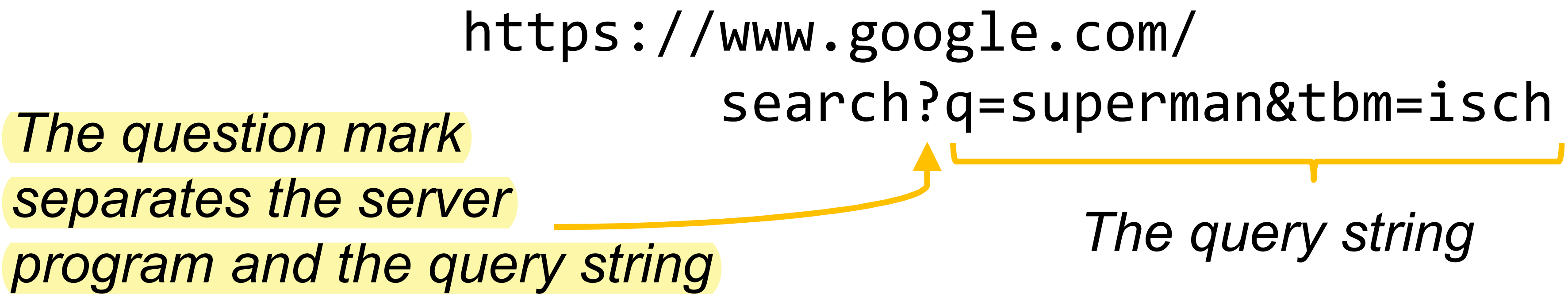
The destination. This is usually a server-side program such as a php script.

GET or POST

- When the form is submitted, it is sent to the server
- A HTML form can use either the GET method or the POST method for sending data to the server
- We won’t talk about the differences here
- We will use the GET method in this presentation

The Query String

- When sending data using the GET method, the data is appended to the end of the URL in a *query string*
- A query string is text containing name and value pairs separated by an ampersand (&)
- Here is a simple query string in a URL:



```
https://www.google.com/
        search?q=superman&tbm=isch
```

The question mark separates the server program and the query string

The query string

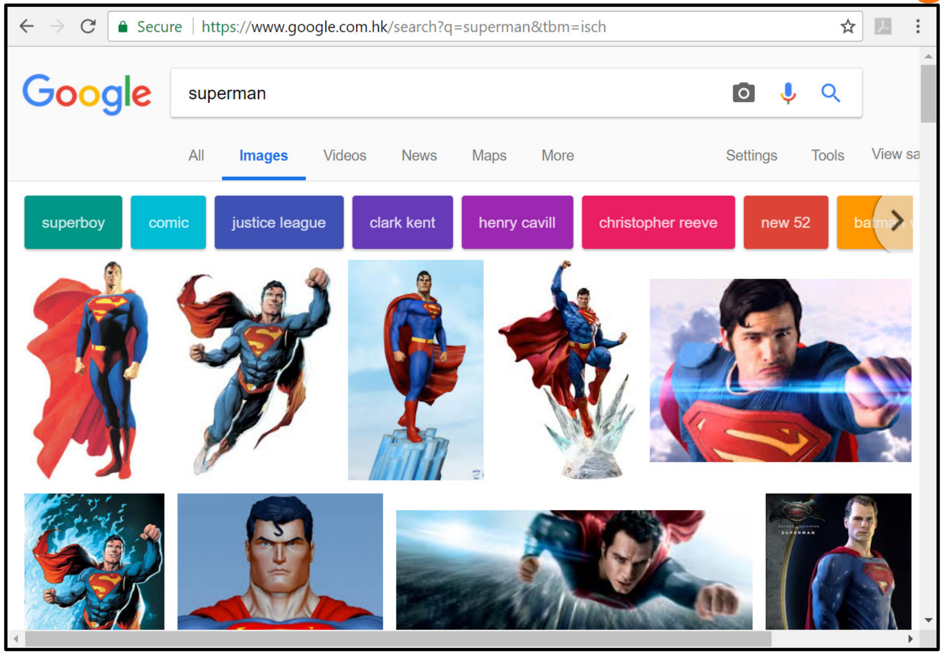
Example of a Google Query String

tbm stands for "to be matched"

`https://www.google.com/search?q=superman&tbm=isch`

- This Google query string has two parameters:
  - `q`
    is the search **q**uery
  - `tbm=isch`
    means
    the search **to be matched** is
    an **i**mage **s**ear**ch**

isch stands for
image search



Secure | https://www.google.com.hk/search?q=superman&tbm=isch

superman

Form Elements Must Have a Name

- Form elements inside a form must all have a `name` attribute
- If an element doesn’t have a `name` attribute then the value won’t be sent to the server!
- The `name` attribute is included in the query string which is sent to the server

Using a Form Button

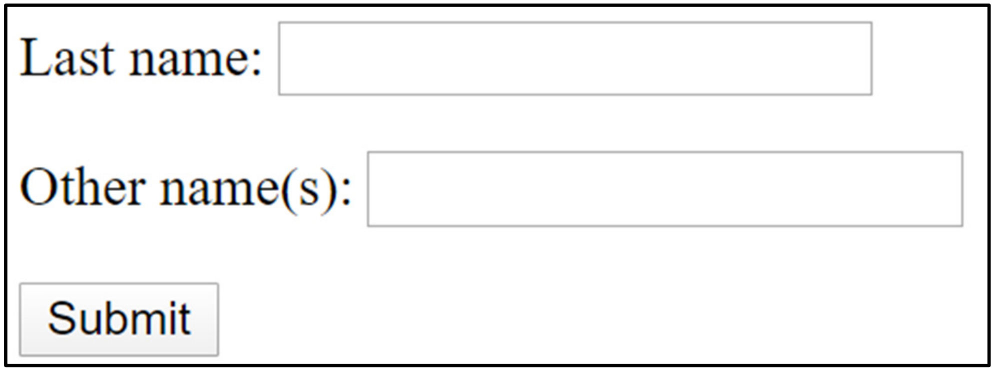
- A form typically has a submit button:

```
<input type="submit">
```

- When the submit button is clicked,
  the browser sends the data to the server

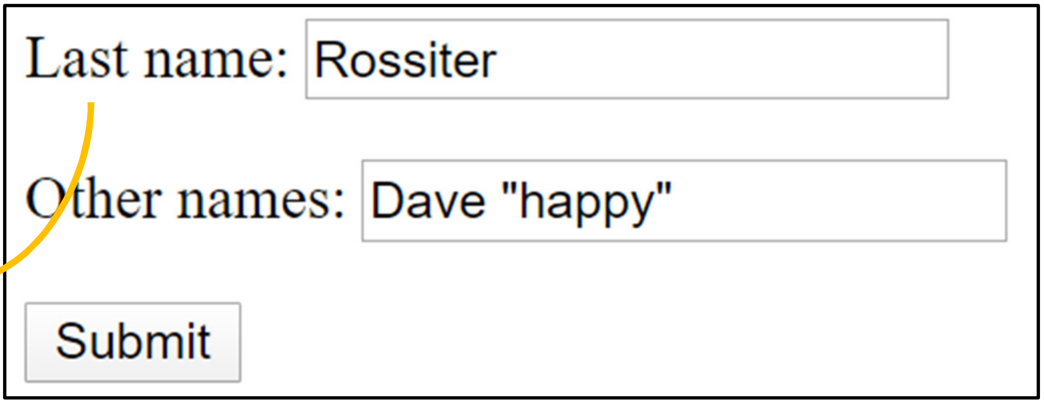
An Example Form

```
<form method="get"
   action="target.php">
        <p>Last name:
          <input type="text" name="lastname"></p>
        <p>Other name(s):
          <input type="text" name="othernames"></p>
        <p><input type="submit"></p>
</form>
```



The Query String

- If the form looks like this:



Last name: Rossiter

Other names: Dave "happy"

then when it is submitted, the query string will be this:

```
...target.php?lastname=Rossiter&othernames=Dave+%22happy%22
```

The space in the text has been changed to a plus sign (+)

The speech marks have been changed to %22 – see next slide

The Query String

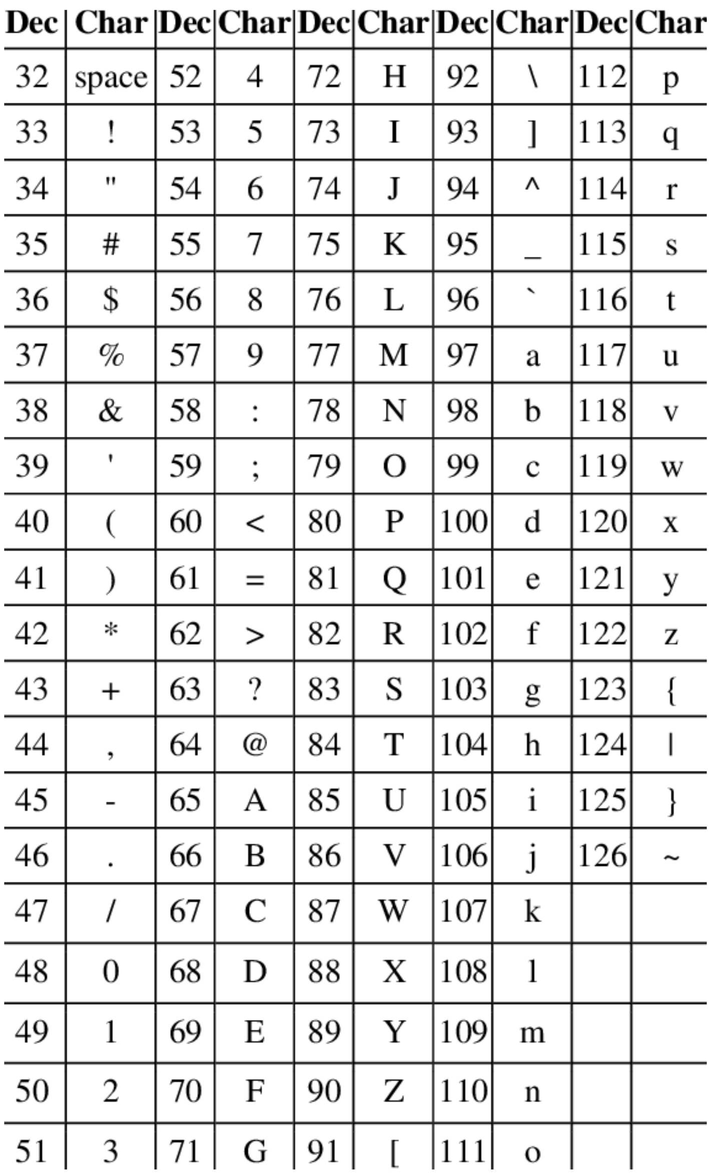
- The changing of the space character is necessary because spaces can’t be included
- There are other characters that also need to be changed before they are sent to the server
- The browser uses the percentage sign (%) followed by the ASCII value of the character, in hexadecimal
  - E.g. you may see `%20` as the changed version of a space instead of `+`

%20 is hexadecimal,
it means (2*16)+0=32
%20 is the space character

%22 means (2*16)+2=34
%22 is the double speech
marks character

The Most Common ASCII Characters

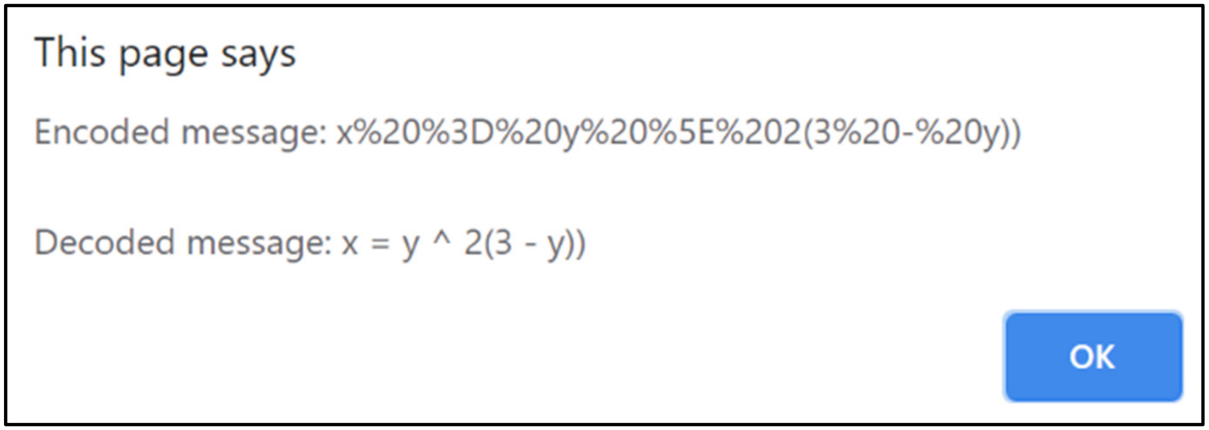
把编号转换成hex然后前面加“ % ”



Dec	Char	Dec	Char	Dec	Char	Dec	Char	Dec	Char
32	space	52	4	72	H	92	\	112	p
33	!	53	5	73	I	93	]	113	q
34	"	54	6	74	J	94	^	114	r
35	#	55	7	75	K	95	_	115	s
36	$	56	8	76	L	96	`	116	t
37	%	57	9	77	M	97	a	117	u
38	&	58	:	78	N	98	b	118	v
39	'	59	;	79	O	99	c	119	w
40	(	60	<	80	P	100	d	120	x
41	)	61	=	81	Q	101	e	121	y
42	*	62	>	82	R	102	f	122	z
43	+	63	?	83	S	103	g	123	{
44	,	64	@	84	T	104	h	124	|
45	-	65	A	85	U	105	i	125	}
46	.	66	B	86	V	106	j	126	~
47	/	67	C	87	W	107	k		
48	0	68	D	88	X	108	l		
49	1	69	E	89	Y	109	m		
50	2	70	F	90	Z	110	n		
51	3	71	G	91	[	111	o		

An Example in JavaScript

- Here is a JavaScript encoding/decoding example:



This page says

Encoded message: x%20%3D%20y%20%5E%202(3%20-%20y))

Decoded message: x = y ^ 2(3 - y))

Here are some characters, to test what happens

```
<script>
 var message = "x = y ^ 2(3 - y))";
    var encoded = encodeURIComponent(message);
    alert("Encoded message: " + encoded + "\n\n" +
          "Decoded message: " + decodeURIComponent(encoded));
</script>
```

- This is useful to demonstrate what a query string will look like

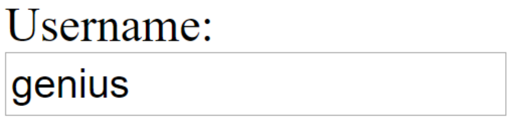
Common Form Elements

- There are a lot of form elements which can go inside a form
- In the following slides, we will look at some more commonly used form elements

Simple Text Inputs

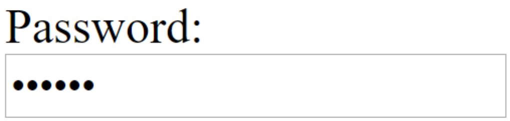
- Simple text inputs can be created using `<input>` , for example:
  - Text field:

```
<input type="text"
       name="username">
```


Username:
genius

  - Password field:

```
<input type="password"
       name="password" maxlength="12">
```


Password:
••••••

type"password": you can not see what you typed in

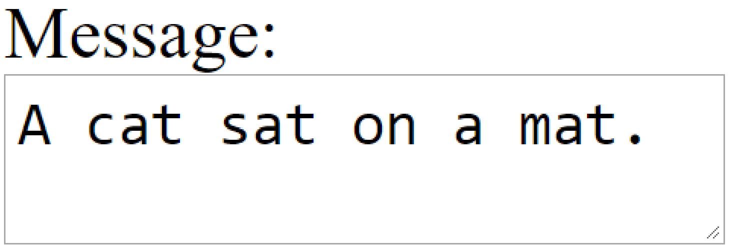
- If you want to, you can use the `maxlength` attribute to restrict how much the user can type

Text Area

- A text area is used for large pieces of text:

```
<textarea name="message">A cat sat
on a mat.</textarea>
```

已经不是<input> tag了。<textarea>是跟<input>平行的一种tag



Message:

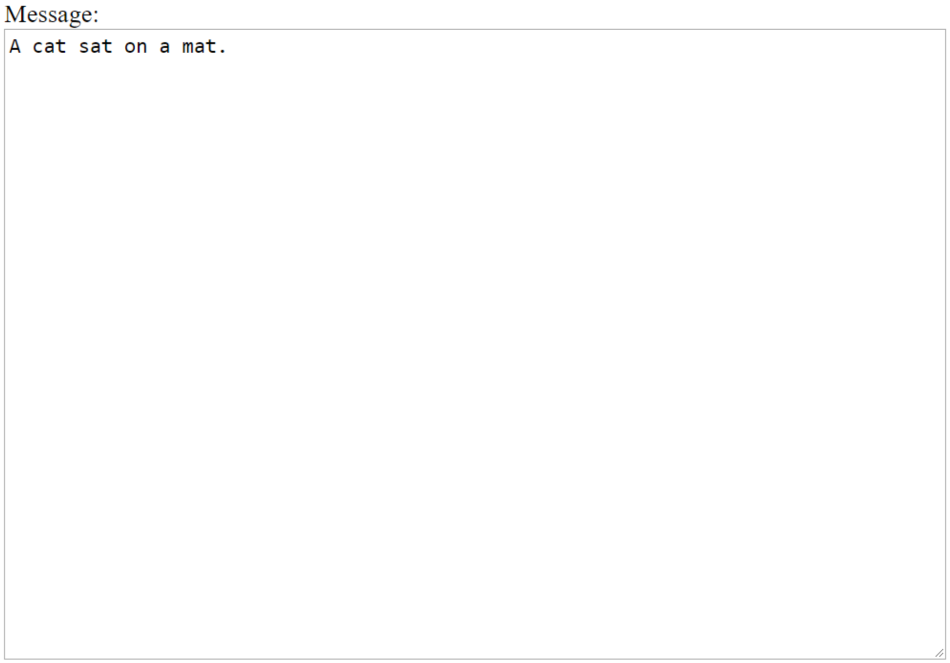
A cat sat on a mat.

- One way to make a bigger box is to adjust `cols` (number of columns) and `rows` (number of rows)

Making a Text Area Bigger

- For example, we can make the text area have 80 columns and 25 rows:

```
<textarea
 name="message"
 cols="80"
 rows="25">A cat sat on a mat.</textarea>
```



Message:

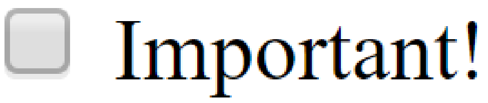
```
A cat sat on a mat.
```

This is the default text shown in the text area when the user typed nothing.

Checkboxes

- Here is an example of a checkbox:

```
<input type="checkbox"
       name="important">
Important!
```

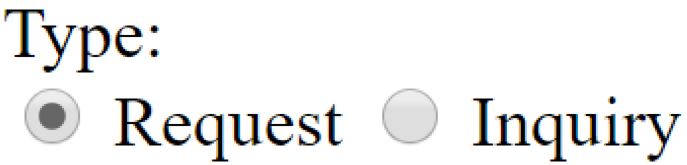


□ Important!

同一道题里面的每一个checkbox用一样的name，这样only one of these choices can be selected.

Radio Buttons

- Here is a group of radio buttons:



Type:

● Request ○ Inquiry

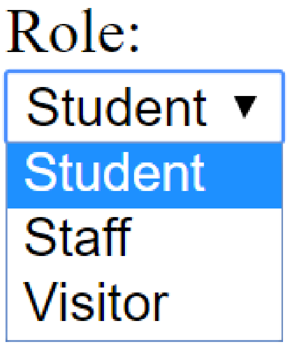
```
<input type="radio" name="type"
       value="request" checked > Request
<input type="radio" name="type"
       value="inquiry"> Inquiry
```

- You can show a radio button (or checkbox) already selected using the `checked` attribute

Drop Down Lists

- Using a combination of the `<select>` tag and `<option>` tag, you can make a drop down list
- For example, here is a drop down list with three options:

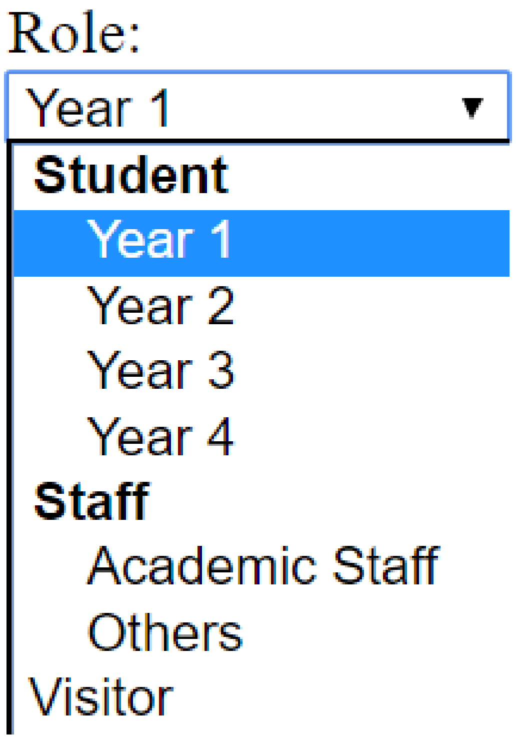
```
<select name="role">
  <option>Student</option>
  <option>Staff</option>
  <option>Visitor</option>
</select>
```



Option Groups

- You can also arrange the options in a structural way using option groups, for example:

```
<select name="role">
  <optgroup label="Student">
    <option>Year 1</option>
    <option>Year 2</option>
    <option>Year 3</option>
    <option>Year 4</option>
  </optgroup>
  <optgroup label="Staff">
    <option>Academic Staff</option>
    <option>Others</option>
  </optgroup>
  <option>Visitor</option>
</select>
```



Hidden Fields

- Hidden fields are text fields that you can’t see in the webpage display:

```
<input type="hidden" name="from"
       value="http://www.ust.hk">
```

- The value stored inside a hidden field can be anything

Google Hidden Fields

- For example, Google has these hidden fields:

```
<input name="dcr" value="0" type="hidden">
<input name="source" type="hidden" value="hp">
<input value="Hn28Woe2F8in8QW7m47QCw"
       name="ei" type="hidden">
```

- They are some information that Google wants to record when you make your query
- The clever thing is that these come from the server, and they get sent back to the server
- So they can be a kind of ‘memory’ for the server

a way to do memory in the form

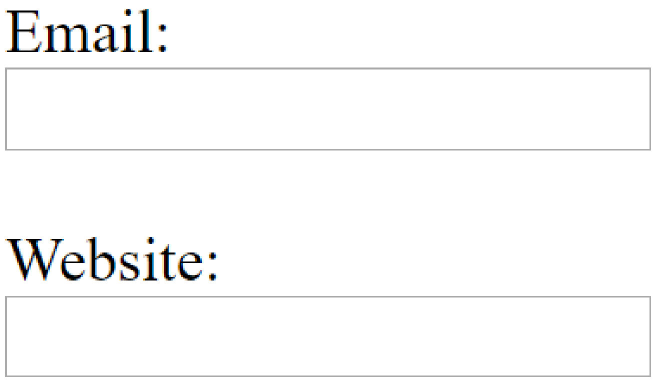
More Recent Form Inputs

- The form elements we have seen so far are the common, older ones
- Some more recent input types:
  - `type="email"`
  - `type="url"`
  - `type="number"`
  - `type="range"`
  - `type="date"`
  - `type="time"`
  - `type="color"`

Email and URL Inputs

- Email and URL input fields look like simple text fields, as shown below:

```
<input type="email"
       name="email">
<input type="url"
       name="website">
```

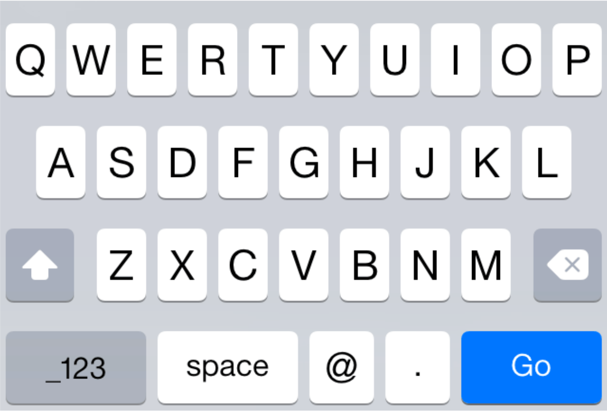


- Why do you want to use them then?
  - Mobile devices will show an appropriate keypad for each of the fields
  - Validation occurs when you submit the form

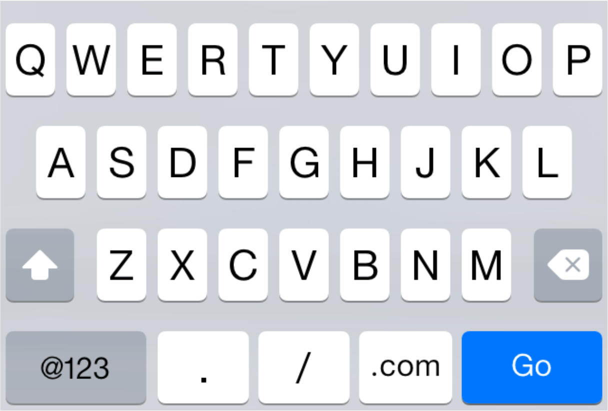
Mobile Keypads

- Here are examples of the iPhone keypads shown for the two input fields:

*Notice the **@** , useful for emails*



*Keypad for **email** input fields*



*Notice the **.com** , useful for web sites*

*Keypad for **url** input fields*

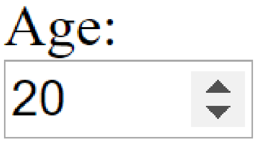
Number and Range Inputs

- Both number and range inputs handle number inputs
- You can set the minimum and maximum values as well as the step, i.e. the size of the increase/decrease

Using Spinner and Slider

- The number control shows a spinner
- The range control shows a slider

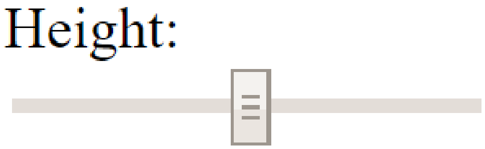
```
<input type="number" name="age" value="15"
       min="0" max="100" step="1">
```



Age:

20

```
<input type="range" name="height"
       min="50" max="200" step="5">
```



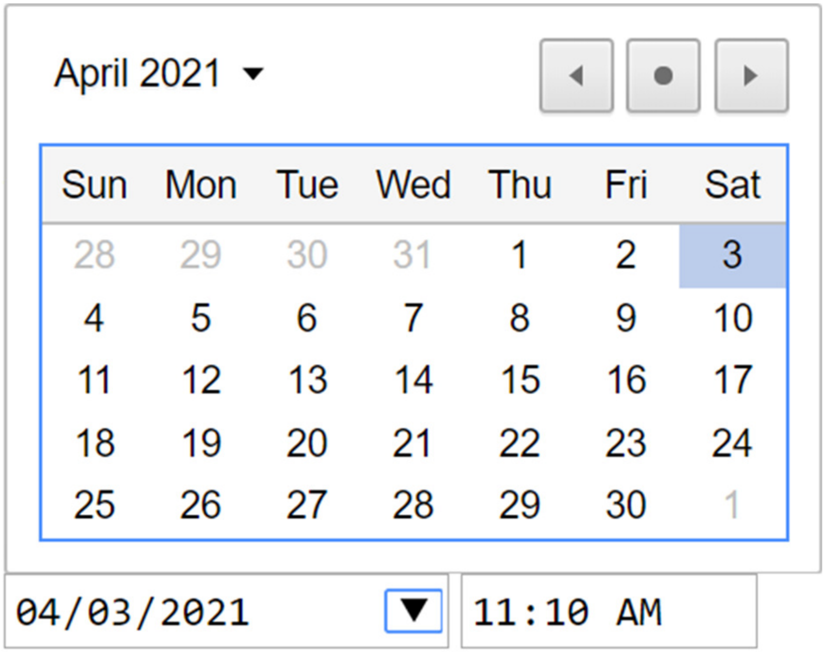
Height:

Date and Time Input

- Date and time input controls:

```
<input type="date"
       name="quiz-date">

<input type="time"
       name="quiz-time">
```



Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	1

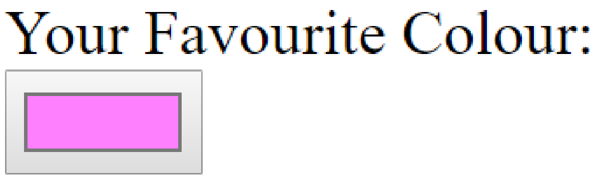
04/03/2021 ▼

11:10 AM

Colour Input

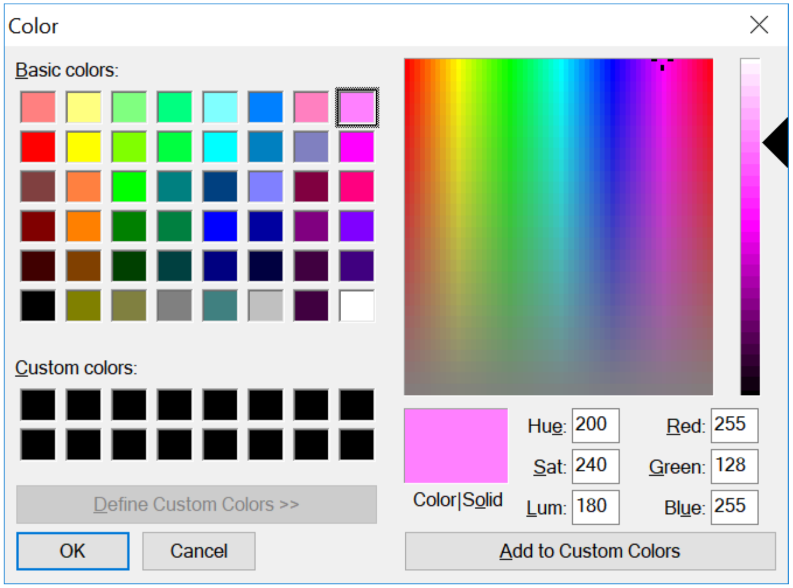
- The colour input control shows a box with a colour inside:

```
<input type="color"
        name="favourite">
```



Your Favourite Colour:

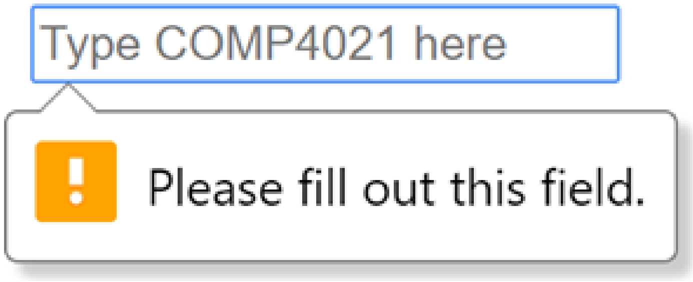
- After clicking, the user will see a colour selector:



Hue: 200
Sat: 240
Lum: 180
Red: 255
Green: 128
Blue: 255

Additional Attributes

- There are various attributes for form elements e.g.:
  - `placeholder` This is a ‘hint’ of what you need to enter
  - `required` This means it must be entered before the form can be sent



Type COMP4021 here

! Please fill out this field.

```
<input type="text" name="course"
 required
 placeholder="Type COMP4021 here">
```

  - `autofocus` Set a particular form input to have focus when the page is loaded

What The Server Program Receives

- For the examples in this presentation, you can use this simple program to see the text that was sent to the server:

```
<?php
    echo "The parameters passed to this PHP program:";
    echo "<pre>" . $_SERVER['QUERY_STRING'] . "</pre>";
?>
```

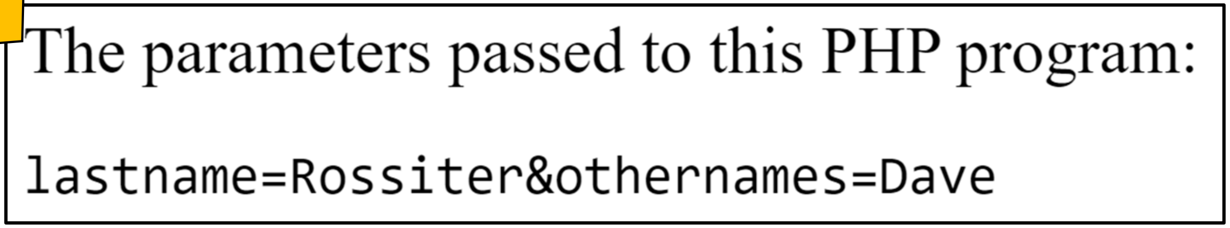
echo a line of html code

pre means "previously formatted", i.e. the browser will not do any formatting.

```
The parameters passed to this PHP program:
<pre>lastname=Rossiter&othernames=Dave</pre>
```

- HTML goes to the browser

- Browser displays the HTML



The parameters passed to this PHP program:

```
lastname=Rossiter&othernames=Dave
```