Forms, CGI

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  - CGI – the Common Gateway Interface
  - Later: Servlets

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- The basics of HTML forms
- How form content is submitted
  - GET, POST
- Elements that you can have in forms
- Responding to forms
  - CGI – the Common Gateway Interface
  - Later: Servlets
- Generation of dynamic Web content

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HTML forms

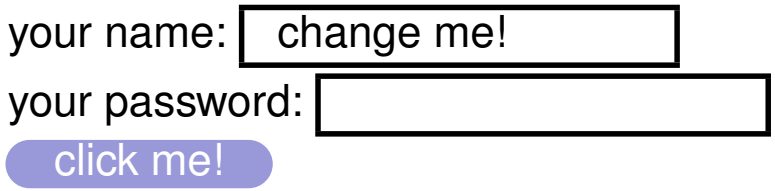
- In most internet programming, you need the user to enter data
- HTML forms offer the basic user interface elements inside HTML
- Forms have a method which corresponds to the HTTP command that will be sent when the form is submitted
- Forms have an action which denotes the URL loaded when the form is sent.
  - The action URL is typically a CGI or a servlet
- Inside the form you can have normal HTML and inputs (user interface elements)

Form example

```
<html>
  <body>
    <form action="http://localhost/response.html" method="get">
      your name:
      <input name="someText" type="text" value="change me!" />
      <br />
      your password: <input name="somePass" type="password" />
      <br />
      <input name="theButton" type="submit" value="click me" />
      <br />
    </form>
  </body>
</html>
```

We submit the form to the `SimpleHttpServer` that we wrote last time (an improved version to also accommodate POST)

Form example . . .



Form submission

Form submission

- Upon submission, the form will generate the following HTTP:

```
GET/response.html?someText=change+me%21&somePass=
sddsfs&theButton=click+me%21 HTTP/1.1
Host: localhost
Connection: Keep-Alive
```

. . . and other headers

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- The format of the data (`inputName=value&...`) is called a query string
- In the GET method the query string is limited to 65535 chars
- The GET query string is visible in the browser. Beware of passwords!

POST form

Simply indicate the method POST

```
<html>
  <body>
    <form action="http://localhost/response.html" method="post">
      your name:
      <input name="someText" type="text" value="change me!" />
      <br />
      your password: <input name="somePass" type="password" />
      <br />
      <input name="theButton" type="submit" value="click me!" />
      <br />
    </form>
  </body>
</html>
```

POST form submission

```
POST /response.html HTTP/1.1
Content-Type: application/x-www-form-urlencoded
Content-Length: 59
...
Host: localhost

someText=change+me%21&somePass=sdfdsf&theButton=click+me%21
```

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POST /response.html HTTP/1.1
Content-Type: application/x-www-form-urlencoded
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  – So the query string is HTTP content

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- When sending data with the POST method, the query string is sent after the HTTP empty line marking the end of the HTTP header.
  – So the query string is HTTP content
- By doing that, the POST method lets you send content with any length (e.g. upload large files)
- The POST query string is not visible in the browser!
  – You can have both GET-style and POST query strings by

```
<form action="someScript?p1=v1&p2=v2" method="post">
```

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  - `http://www.htmlhelp.com/reference/html40/forms/input.html`

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- `type="reset"` creates a button that brings all inputs to their initial values

Form <textarea> and <select>

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- ```
  <textarea name="aText">
     initial text
     multiline
  </textarea>
  http://www.htmlhelp.com/reference/html40/forms/textarea.html
  ```
  ```

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  <textarea name="aText">
     initial text
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  ```
  http://www.htmlhelp.com/reference/html40/forms/textarea.html
- ```
  <select name="aChoice" >
     <option value="1">option title</option>
     <option value="two">second</option>
  </select>
  ```
  http://www.htmlhelp.com/reference/html40/forms/select.html

  To indicate an initial value, options can be declared <option selected ...>
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  To indicate an initial value, options can be declared `<option selected ...>`
  If the select is declared `<select multiple ...>`, multiple options can be sent
- The query string looks like `aChoice=1&aChoice=two` etc, i.e. the name repeats for each value

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- `<input type="radio" name="x" value="y"/>`
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  - Normally only one radio button can be checked

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- CGI lets us to find out what has been in the HTTP request that the server got
  `http://hoohoo.ncsa.uiuc.edu/cgi/overview.html`
  `http://www.cgi-resources.com`

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- The standard output is the only place for program output

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  - Both the HTTP headers and content
    - Headers, empty line, content
  - Content is typically HTML but not necessarily

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- `CONTENT_TYPE`: the content-type HTTP header
- `CONTENT_LENGTH`: the content-length HTTP header (useful in `POST`)

CGI at NADA

- Put your CGI program in your CGI dir at NADA (if it's activated)
  `/afs/nada.kth.se/public/www.student/cgibin/yourUserName/yourProgram`

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  `/afs/nada.kth.se/public/www.student/cgibin/yourUserName/yourProgram`
- Make sure that the file has execution rights

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fs setacl . system:anyuser rl
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  `http://cgi.student.nada.kth.se/cgibin/yourUserName/yourProgram`
  - You can check the server error log and try to find your error between other people's errors
    `http://cgi.student.nada.kth.se/cgi-bin/get-errlog`

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- Servlets are the solution in Java

A form to respond to

```
<FORM ACTION="/cgi-bin/test.pl" METHOD="GET">
   Write a message: <INPUT TYPE="text"
                    NAME="message" SIZE=20
                    MAXLENGTH=40 VALUE="">
   <INPUT TYPE = "submit" VALUE= "Send it!">
   <INPUT TYPE= "reset" VALUE= "Remove it!" >
</FORM>
```

Responding to a form in a PERL CGI

```
#!/usr/local/bin/perl
print "Content-type: text/html\\n\\n";
## CGIs must print HTTP headers AND empty line!
$REQUEST_METHOD = $ENV\{'REQUEST_METHOD'\};
$QUERY_STRING = $ENV\{'QUERY_STRING'\};
## Reading environment variables
if($REQUEST_METHOD ne "GET") \{
  print"Sorry, i can only do <code>GET</code><br />Bye!";
  exit(0); \}
($COMMAND, $MESSAGE) = split(/=/, $QUERY_STRING);
## Split the query string via PERL pattern matching.
if($COMMAND eq "message") \{
   print "<h1>You sent:</h1>";
   print "Message: $MESSAGE";
   exit(0);
\} exit(0);
```

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- You can use CGI to generate dynamic content even if you don't respond to a form
- Or you can use Java servlets for the same purpose