Dynamic Web Pages

Forms in Python Scripts

- Python code to write HTML
- default input values

Web Interface for Determinant

- dynamic interactive forms
- asking for a matrix
- computing the determinant

Exercises

MCS 275 Lecture 20
Programming Tools and File Management
Jan Verschelde, 29 February 2008

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Forms in Python Scripts

writing HTML

What we did before:

1. form element in HTML page triggers action, example: submit user name and password.
2. Action triggered by submit button is defined by a Python script.

Advantage/disadvantage:

+ Separate HTML layout and actions.
– Submit brings up a new page each time.

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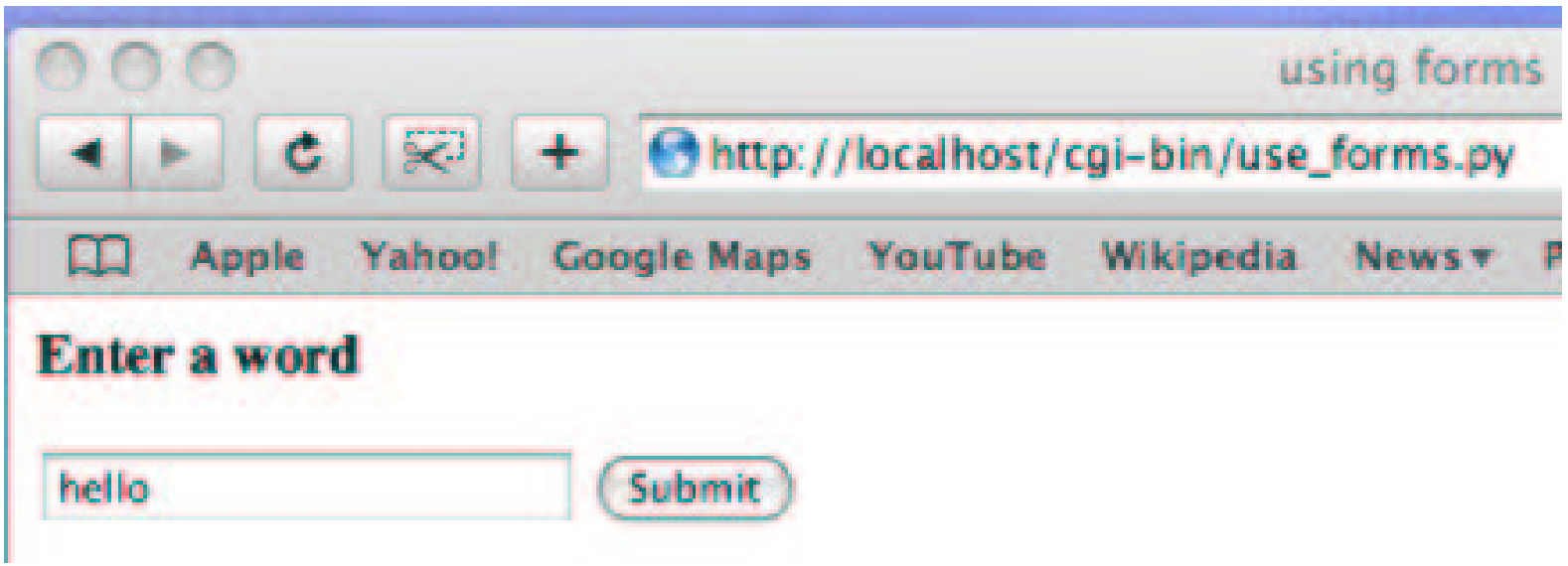
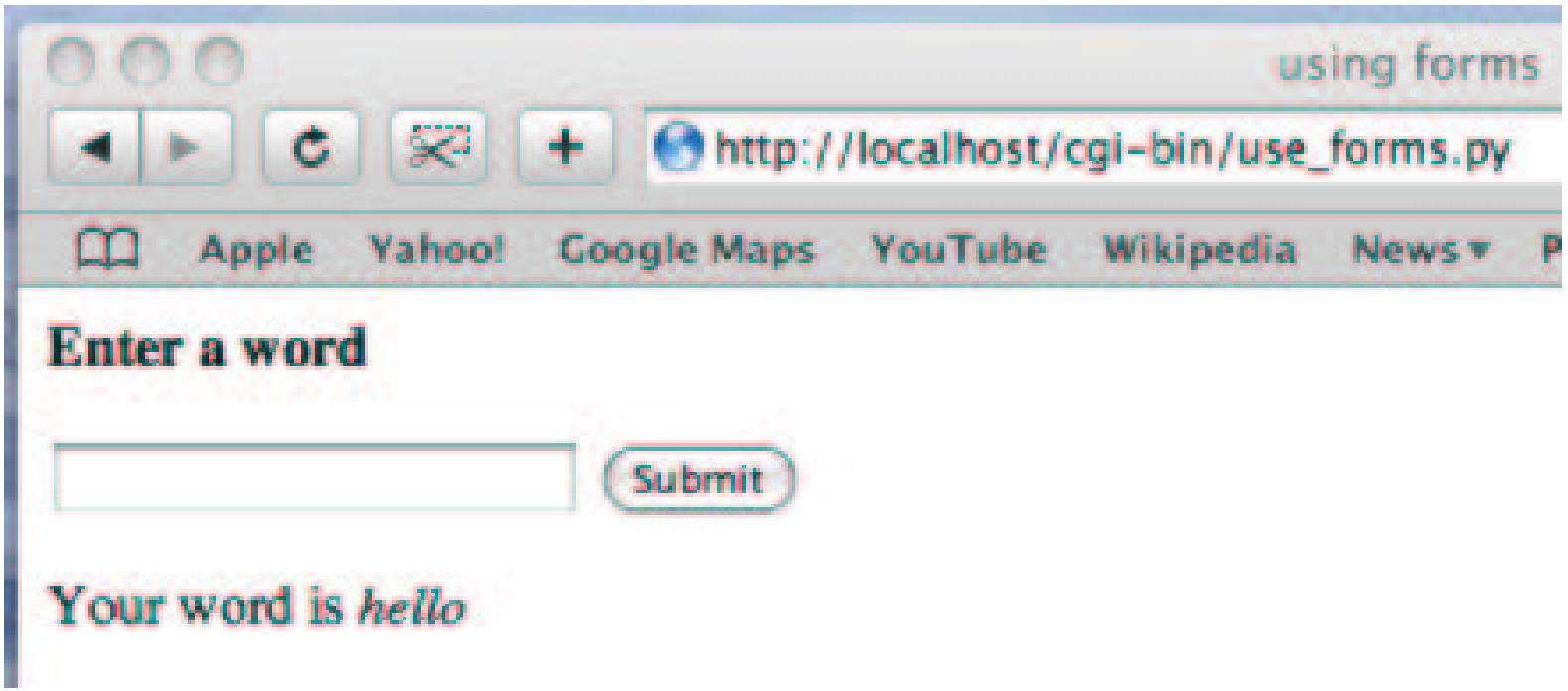
Asking for a Word

running `use_forms.py`



Confirming the Word

running `use_forms.py`



Printing a Header

start of `use_forms.py`

```
#!/Library/Frameworks/.../bin/python
import cgi

def PrintHeader(title):
   """
   writes title and header of page
   """
   print """Content-type: text/html

<html>
<head>
<title>%s</title>
</head>
<body>""" % title

PrintHeader("using forms")
```

Printing a Header

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<body>""" % title

PrintHeader("using forms")
```

printing a form

script use_forms.py continued

```
print """<b>Enter a word</b>
   <form method = "post" action = "use_forms.py">
   <p>
     <input type = "text" name = "word">
     <input type = "submit">
   </p>
   </form>"""

form = cgi.FieldStorage()
if form.has_key("word"):
   print """<p>Your word is <em>%s</em></p>
   """ % form["word"].value

print "</body></html>\n"
```

printing a form

script use_forms.py continued

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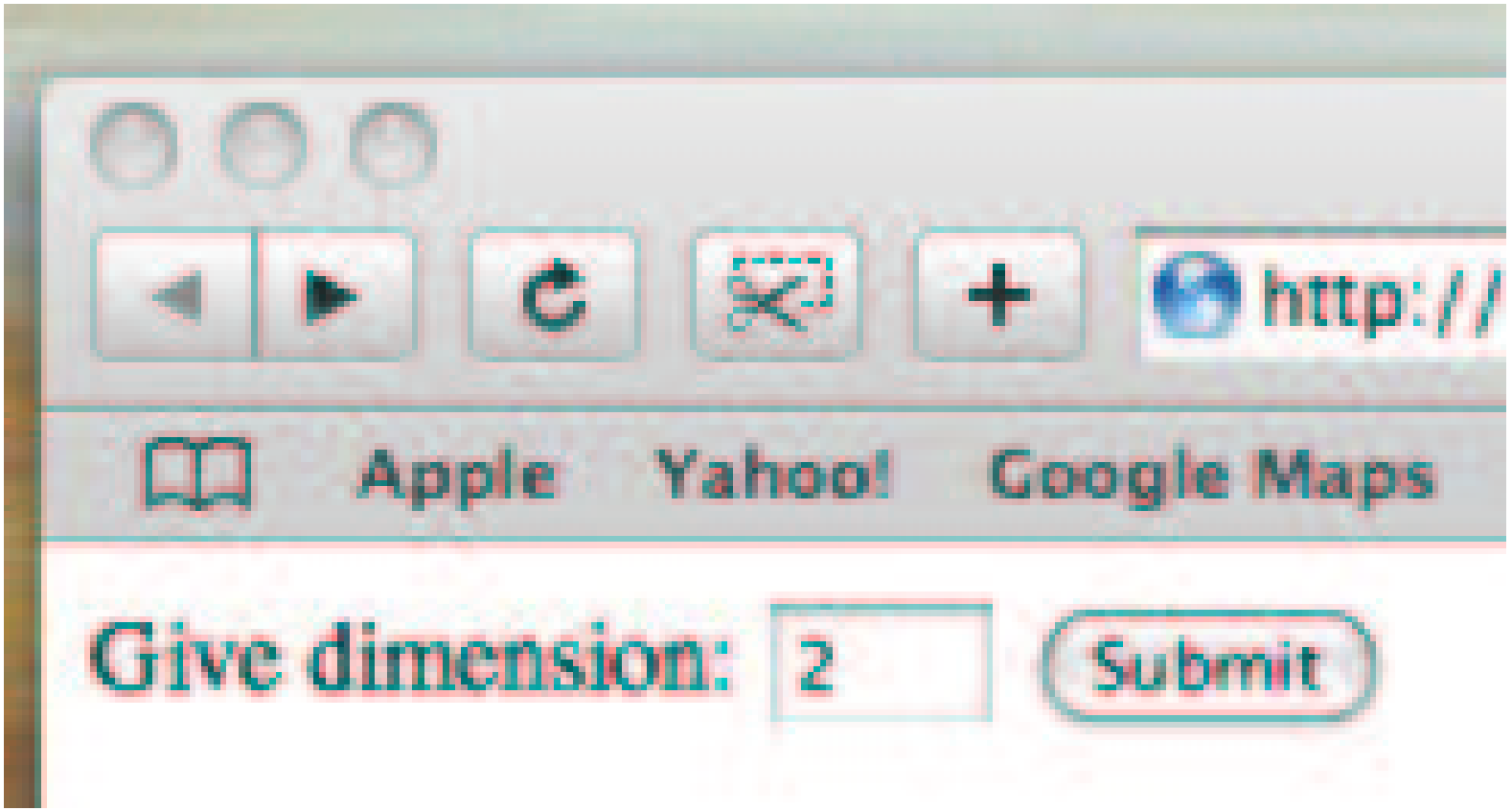
Default Values

in input fields



The "2" is filled in already, is default value.

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Forms with Defaults

in input fields

```
print """<form method = "post"
                 action = "web_det.py">
<p>
  Give dimension:
  <input type = "text" name = "dim"
         size = 4 value = 2>

  <input type = "submit">
</p>
</form>"""
```

Forms with Defaults

in input fields

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print """<form method = "post"
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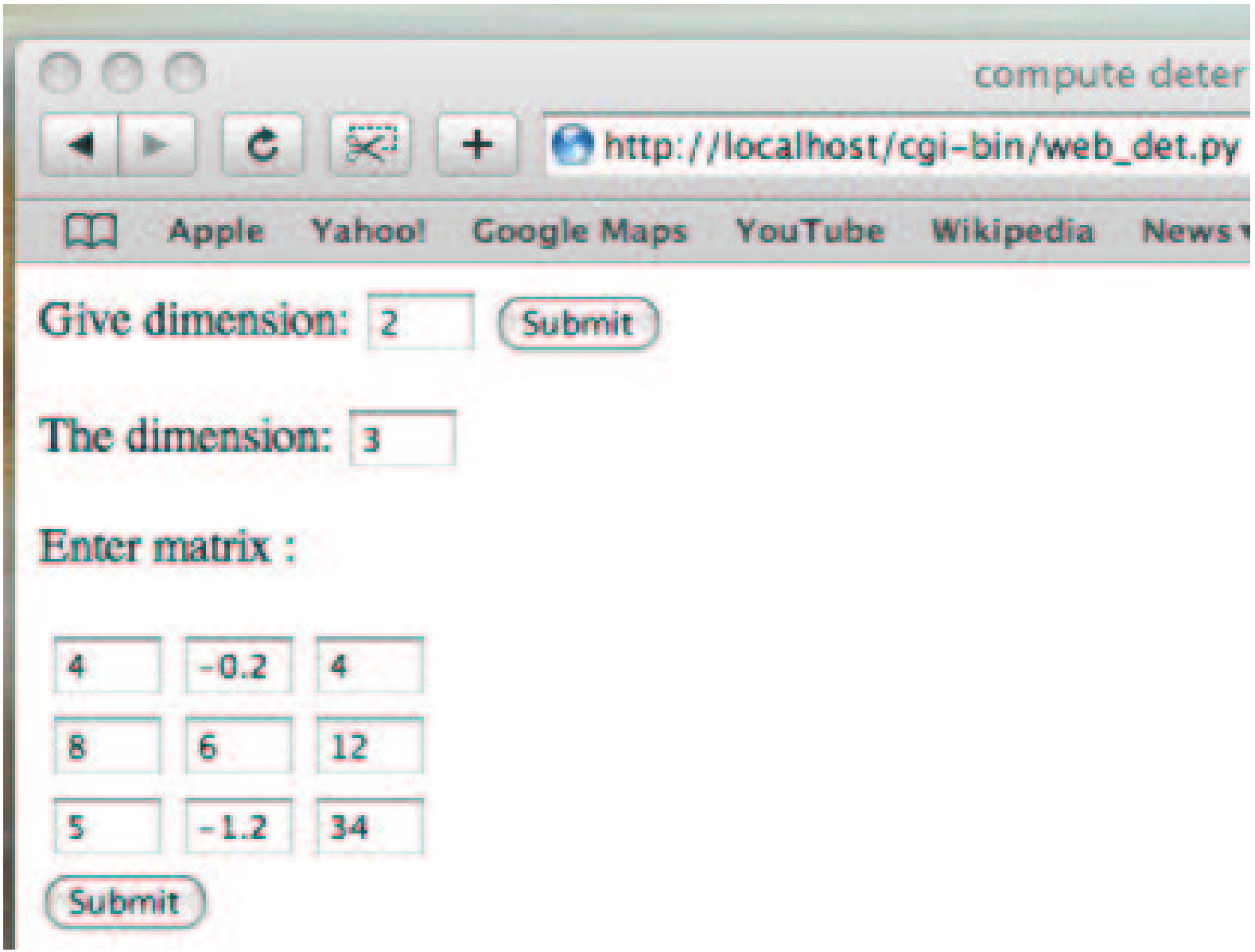
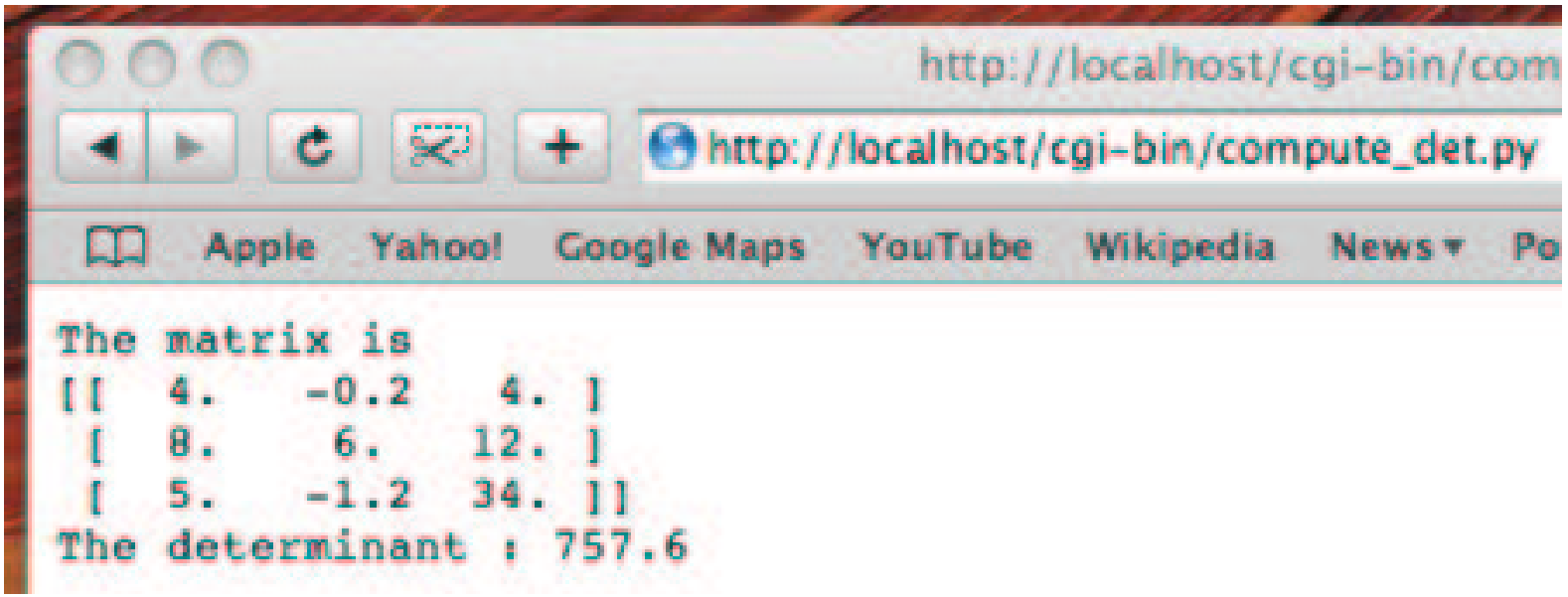
Asking for a Matrix



Computing the Determinant



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Script for Web Determinant

The script is a sequence of two forms:

1. we ask for *the dimension* of the matrix
   The dimension is then used to generate a table of input elements to give the entries of the matrix.

2. we ask for *the entries* of the matrix
   The second form is processed by the same script.
   The action of this form brings up a new page with the matrix and the determinant.

The dimension is passed from one form to the other ***through an input element***.

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The Main Function

of `web_det.py`

```
def main():
    """
    web interface to compute a determinant
    """
    PrintHeader("compute determinant")
    AskDimension()
    form = cgi.FieldStorage()
    if form.has_key("dim"):
        n = int(form["dim"].value)
        AskMatrix(n)

    print "</body></html>\n"

main()
```

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The Function AskMatrix()

```
def AskMatrix(n):
    """
    form to enter an n-by-n  matrix
    """
    print """<form method = "post"
                    action = "compute_det.py">"""
    print """The dimension:
       <input type = "text" name = "dim"
              size = 4 value = %d>""" % n
```

Observe how the value of the dimension is set in the input element dim of the form.

The Function AskMatrix()

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def AskMatrix(n):
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    form to enter an n-by-n  matrix
    """
    print """<form method = "post"
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    print """The dimension:
       <input type = "text" name = "dim"
              size = 4 value = %d>""" % n
```

Observe how the value of the dimension is set in the input element `dim` of the form.

AskMatrix() continued

```
print "<p>Enter matrix :</p>"
print "<table>"
for i in range(0,n):
   print "<tr>"
   for j in range(0,n):
      print """<td><input type = "text"
      name = %d,%d size = 4></td>""" % (i,j)
print "</table>"
print """<input type = "submit">"""
print "</form>"
```

The names of the entries are strings i, j.

AskMatrix() continued

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print "<p>Enter matrix :</p>"
print "<table>"
for i in range(0,n):
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AskMatrix() continued

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Beginning of `compute_det.py`

```
#!/Library/Frameworks/.../bin/python
import cgi

from numpy import matrix, zeros
from numpy.linalg import det
```

The Main Function

in `compute_det`

```
def main():
    """
    web interface to compute a determinant
    """
    print "Content-type: text/plain\n"
    form = cgi.FieldStorage()
    if form.has_key("dim"):
        n = int(form["dim"].value)
        d = Determinant(form,n)
        print "The determinant :", d
```

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```

The Determinant() Function

```
def Determinant(form,n):
    """
    returns the determinant of the matrix
    available in the form
    """
    A = zeros((n,n),float)
    for i in range(0,n):
        for j in range(0,n):
            info = "%d,%d" % (i,j)
            if form.has_key(info):
                A[i,j] = float(form[info].value)
    print "The matrix is"
    print A
    return det(A)
```

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Exercises

1. Modify the `use_forms.py` so that it places by default one word in the input element, *with all vowels removed*. Ask the user to supply the missing vowels. In reaction to the submit, compare the word of the user with the original word and give feedback.
2. Write a Python script `web_sum.py` to sum n numbers. Like in `web_det.py`, first the user is asked to supply n and then n input elements have to be filled out before another script `compute_sum.py` can compute the sum.
3. The current version of `web_det.py` takes undefined entries to equal zero. Change it so the user is asked to return and provide the missing entries.
4. Make a recursive form. The input element asks the user for a number. With each submit, the number is doubled.