MSCI 346 – Spring 2019

LAB 3: Web Development, HTML and PHP

Introduction to Web Development

We need to perform activities such as:

- Connecting to the database server
- Querying the database
- Displaying results on a web form
- Querying the database using user-input as a parameter

1. HTML to create web forms
2. Server Side Scripting (PHP)

Recap of Lab2!

HTML - Hypertext Markup Language

- HTML is a set of “markup” symbols (ie. code) used to render content for the web.
- The markup tells the web browser how to display the web page’s text, images, sound, and video files to the user.
- The individual markup codes are referred to as elements, but many people also refer to them as tags.

HTML Example

```
<!DOCTYPE html>
<html>
   <head>
      <title>My Website Title</title>
      <link rel="stylesheet" type="text/css” href="mystyle.css">
   </head>
   <body>
       <h1>Level 1 Heading</h1>
       <p>Paragraph content, “Hello world!”</p>
   </body>
</html>
```

HTML Form

- <input type="the_type" name="unique_name"></input>
  - type="text" creates a plaintext input field
  - type="password" create an obscured password field
  - name="" sets variable names for data when form is submitted
- Example

```
<form>
    <label for="firstname">First Name:</label>
    <input type="text" name="firstname"></input><br>
    <label for="lastname">Last Name:</label>
    <input type="text" name="lastname"></input><br>
    <label for="password">Password:</label>
    <input type="password" name="pass"></input>
</form>
```

HTML Form

- <input type="the_type" value="button_value" name="unique_name"></input>
  - type=“checkbox" input can take multiple checked values
  - type="radio" input can take one value in a set
  - value="" sets the real value when a user makes a selection
  - name="" sets variable name for data when form is submitted
- Example

```
…
<form>
    <label for="gender">Gender:</label><br>
    <input type="radio" name="gender" value="male">Man</input><br>
    <input type="radio" name="gender" value="female">Woman</input><br>
    <label for="Interests">Interests:</label><br>
    <input type="checkbox" name="interests" value="hockey">Hockey</input><br>
    <input type="checkbox" name="interests" value="lacrosse">Lacrosse</input><br>
    <input type="checkbox" name="interests" value="football">American
Football</input><br>
</form>
```

HTML Form

- <input type="submit"></input>
  - Defines a submit button.
  - Sends form data to a server when clicked.
  - The data is sent to the page specified in the form’s action attribute.
- Example

```
<form action=“submit.html" method="get">
    <label for="firstname">First Name:</label>
    <input type="text" name="firstname"></input><br>
    <label for="lastname">Last Name:</label>
    <input type="text" name="lastname"></input><br>
    <input type="submit" value="Submit the Form"></input>
</form>
```

Embed Picture to HTML files

- HTML images are defined with the <img> tag.
- The source file (src), alternative text (alt), and size (width and height) are provided as attributes.
  - src = “file name/file location”
  - alt = “alternative info. to be provided if the image cannot be displayed”
  - Style = define properties of the picture

```
7. <img src="bb8.gif" alt="BB8"
8.  style="width: 600px; height: 338px;"><br>
```

Redirect to Another Webpage

- Create a link to redirect to a different webpage.
- HTML links are defined with the <a> tag.
  - href = “name/destination of the webpage that will be redirected to”

```
23. <a href="addPicture.html">How to add pictures</a>
```

How to add pictures

Exercise 1: Deploy the hello_world.html

- Create file “hello_world.html” on your local machine
  - html examples in Sections 1.3 to 1.6
- Transfer the file to your public_html directory
- Rename the file to index.html and hit refresh

- Open a web browser and go to the link :

mansci-db.uwaterloo.ca/~your_username

Introduction to PHP

- PHP stands for Hypertext Preprocessor
- It is a server-side programming language
  - Designed primarily for web development
- HTML is interpreted by the web browser while PHP is interpreted by the web server
- PHP can be mixed with HTML to create dynamic content on websites
- PHP can authenticate to and interact with MySQL databases using many available Application Programming Interfaces (APIs) like the mysql extension, mysqli, or PDO_MySQL
- Documentation: http://php.net/manual/en/index.php

PHP syntax: tags and variables

- Opening tag: <?php
- Closing tag: ?>
- Variable names start with the ‘$’ sign
- Echo prints on the screen/web browser after the .php file is hosted
- ‘.’ concatenates strings

```php
<?php
 $name = 'Only PHP';
 echo 'Learning '. $name;
 ?>
```

PHP syntax

- HTML tags can be embedded within PHP code

```php
<?php
$name = 'HTML embedded in PHP';
echo '<p>Learning ' . $name . '.</p>';
?>
```

- PHP can also be embedded into HTML

```php
<html>
 <head>
  <title>PHP Test</title>
 </head>
 <body>
<p>
 <?php
 $name = 'PHP embedded in HTML';
 echo 'Learning '. $name;
 ?>
</p>
```

- PHP code can be used to dynamically change value of an input text box or any other input HTML object.

```php
<p>
 <label for="learn">Learning</label>
 <input type="text" name="learn" style="width: 300px;" value="<?php echo $name . ' way 2';?>">
<p>
```

Create and deploy PHP files

- There are many free PHP editors that can be found online
  - For this course, it is enough to use Notepad++
  - Save the files with the extension .php
- The web server mansci-db.uwaterloo.ca will host our web form. Transfer the file you want to deploy to the public_html directory of this server. This needs to be done to make our file accessible through the internet
- Transfer your files.
  - Winscp: Connect to mansci-db.uwaterloo.ca on port 22 (using your Quest username and password) and drag the file into the public_html directory there.
- Rename the file as index.php if it is the homepage
- Now this web form can be accessed through a web browser

Exercise 2: Deploy the php_html.php

- Create file “php_html.php” on your local machine
  - PHP code in Sections 2.1 to 2.4
- Transfer the file to your public_html directory
- Rename the file to index.php and hit refresh
  - .html has priority over .php ->please rename index_html created in exercise-1

- Open a web browser and go to the link :

mansci-db.uwaterloo.ca/~your_username

- PHP alone, PHP embedded in HTML and HTML embedded in PHP have been interpreted and are displayed
  - PHP by the web server mansci-db.uwaterloo.ca and HTML by the local machine’s web browser

Exercise 3:

- <input type="submit"></input>
  - Defines a submit button.
  - Sends form data to a server when clicked.
  - The data is sent to the page specified in the form's action attribute.
- Example

```
<form action="submit.html" method="get">
    <label for="firstname">First Name:</label>
    <input type="text" name="firstName"></input><br>
    <label for="lastname">Last Name:</label>
    <input type="text" name="lastName"></input><br>
    <input type="submit" value="Submit the Form"></input>
</form>
```

Form data is usually handled by a server side language (e.g. PHP)

Exercise 3 (Cont'd)

- <input type="submit"></input>
  - Defines a submit button.
  - Sends form data to a server when clicked.
  - The data is sent to the page specified in the form's action attribute.
- Example

```
<form action="reactionPage.php" method="get">
    <label for="firstname">First Name:</label>
    <input type="text" name="firstName"></input><br>
    <label for="lastname">Last Name:</label>
    <input type="text" name="lastName"></input><br>
    <input type="submit" value="Submit the Form"></input>
</form>
```

Form data is usually handled by a server side language (e.g. PHP)

Exercise 3

- Download reactionPage.php file from Learn
- Transfer the file to your public_html directory
- Create form in your index.php file (previous slide)
  - reactionPage.php in the form action

- Open a web browser and go to the link :

mansci-db.uwaterloo.ca/~your_username

TODAY:

- Displaying outputs, HTML lists, tables
- GET&POST Methods
- Simple Examples:
  - Body mass calculator
  - Currency convertor

HTML Lists

```
<!DOCTYPE html>
<html>
<body>
<h2>An Unordered HTML List</h2>
<ul>
  <li>Coffee</li>
  <li>Tea</li>
    <ul>
      <li>Black tea</li>
      <li>Green tea</li>
    </ul>
  <li>Milk</li>
</ul>
<h2>An Ordered HTML List</h2>
<ol>
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
</ol>
</body>
</html>
```

An Unordered HTML List

- Coffee
- Tea
  - Black tea
  - Green tea
- Milk

An Ordered HTML List

1. Coffee
2. Tea
3. Milk

https://www.w3schools.com/html/html_lists.asp

HTML Tables

```
<html>
<head>
<style>
table, th, td {
  border: 1px solid black;
  border-collapse: collapse;
}
</style>
</head>
<body>
<h2>Simple HTML Table</h2>
<table style="width:100%">
  <caption>Employees</caption>
  <tr>
    <th>Firstname</th>
    <th>Lastname</th>
    <th>Age</th>
    <th>Title</th>
  </tr>
  <tr>
    <td>Jill</td>
    <td>Smith</td>
    <td>50</td>
    <td>Manager</td>
  </tr>
  <tr>
    <td>Eve</td>
    <td>Jackson</td>
    <td>35</td>
    <td>Team Leader</td>
  </tr>
  <tr>
    <td>John</td>
    <td>Doe</td>
    <td>23</td>
    <td>Software Developer</td>
  </tr>
</table>
</body>
</html>
```

Simple HTML Table

Employees

Firstname	Lastname	Age	Title
Jill	Smith	50	Manager
Eve	Jackson	35	Team Leader
John	Doe	23	Software Developer

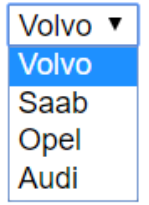
https://www.w3schools.com/html/html_tables.asp

HTML Select

```
<!DOCTYPE html>
<html>
<body>

<select>
  <option value="volvo">Volvo</option>
  <option value="saab">Saab</option>
  <option value="opel">Opel</option>
  <option value="audi">Audi</option>
</select>

</body>
</html>
```



https://www.w3schools.com/tags/tag_select.asp

HTML's Method Get and Post

- Two commonly used methods for a request-response between a client and server are GET and POST

	GET	POST
Visibility	Data is visible to everyone as it sent in the URL. Less Secure.	Data is not displayed in the URL. The requested data is sent in the HTTP message body of a POST request. More secure.
BACK button/Reload	No Change / Harmless	Data will be re-submitted
History, Cache and Bookmarked	Parameters remain in browser history. Can be cached and bookmarked.	Parameters are not saved in browser history. Cannot be cached or bookmarked.
Restrictions on data length	The length of a URL and thus the size of data is limited (maximum URL length is 2048 characters)	No restrictions

http://www.w3schools.com/tags/ref_httpmethods.asp

https://mansci-db.uwaterloo.ca/~zkorkmaz/index.html

Apps | SNAP: Stanford Net... | Traversing Relations... | java - Understandin... | hy/ldbc_socialnet_b... | hustlijian/ldbc_snb_... | working commit ld...

Form example using GET method

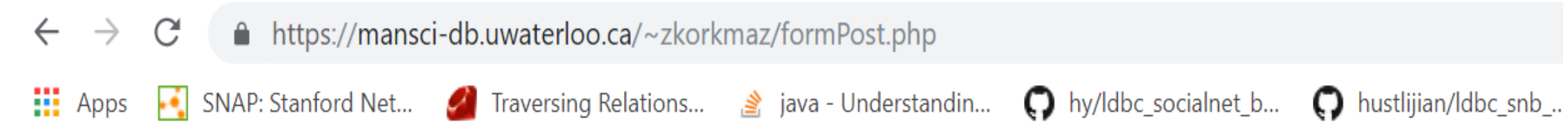
Enter your value

Send Reset

Form example using POST method

Enter your value

Send Reset

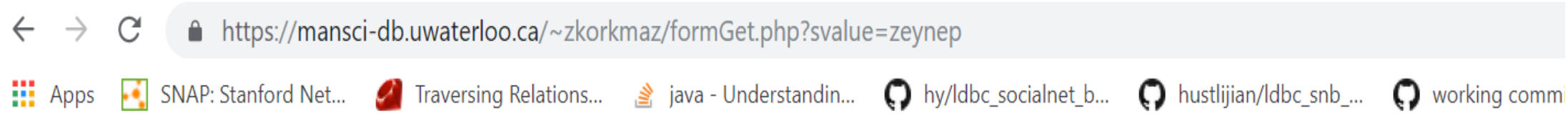


POST method

Form example using POST method

Value passed from HTML-form is korkmaz It sent in HTTP request and cannot be seen in address bar

Back to form



GET method

Form example using GET method

Value passed from HTML-form is zeynep It is sent in URL and seen in address bar

Back to form

More PHP syntax: if-else and while

```
…
<?php
        $numerator = 30;
        $denominator = 5;
        $div_result = $numerator / $denominator;

        echo '<p>';
        if ($div_result % 2 == 0) { // % is modulo
                echo $div_result . ' is even.';
        } else {
                echo $div_result . ' is odd.';
        }
        echo '</p>';
?>
…
```

msci-teaching.uwaterloo.ca/~r24mille/

6 is even

```
…
<?php
$count = 0;
while ($count < 10) {
        print $count. '<br/>\n';
        $count++; // $count = $count + 1;
}
?>
…
```

msci-teaching.uwaterloo.ca/~r24mille/

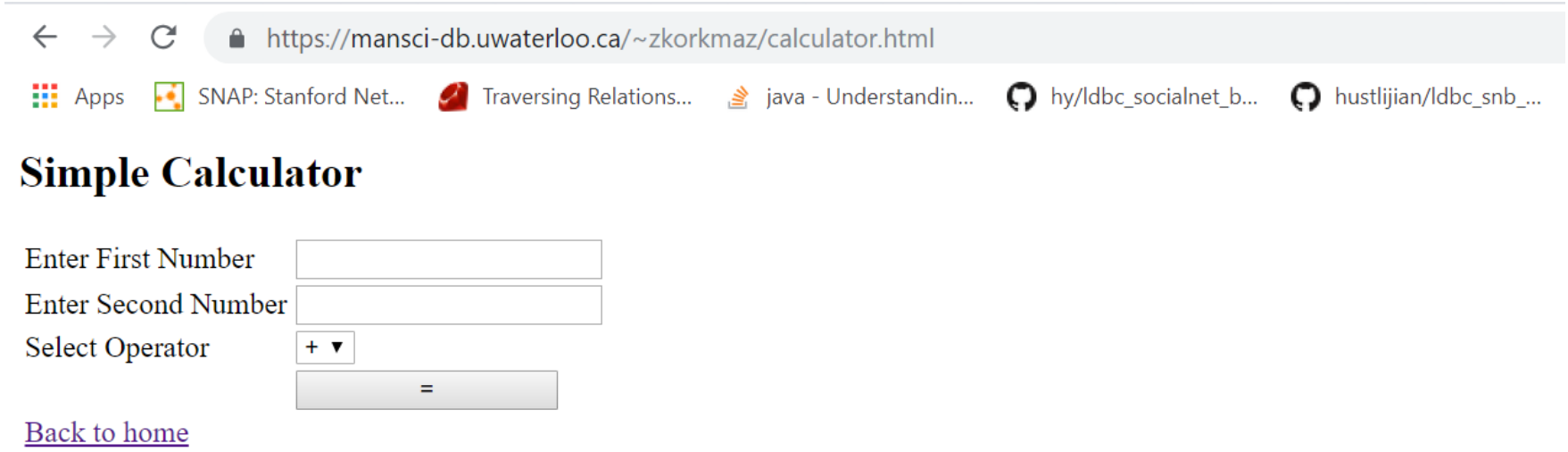
0
1
2
3
4
5
6
7
8
9

Exercise-1

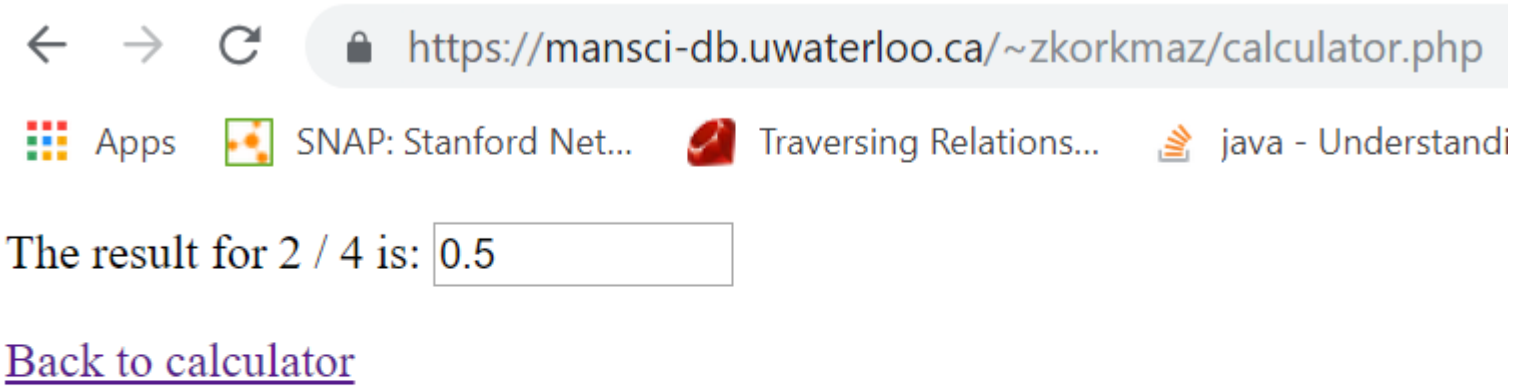
Create a simple calculator including **four** basic **mathematical operations** (+,-,/,x)

- Get two numbers, and the operator as input.
  - You can decide on the input type for the operator selection
- Calculate the result, and print the output.

Simple Calculator



Simple Calculator



Exercise-2

Create a body mass index (BMI) calculator

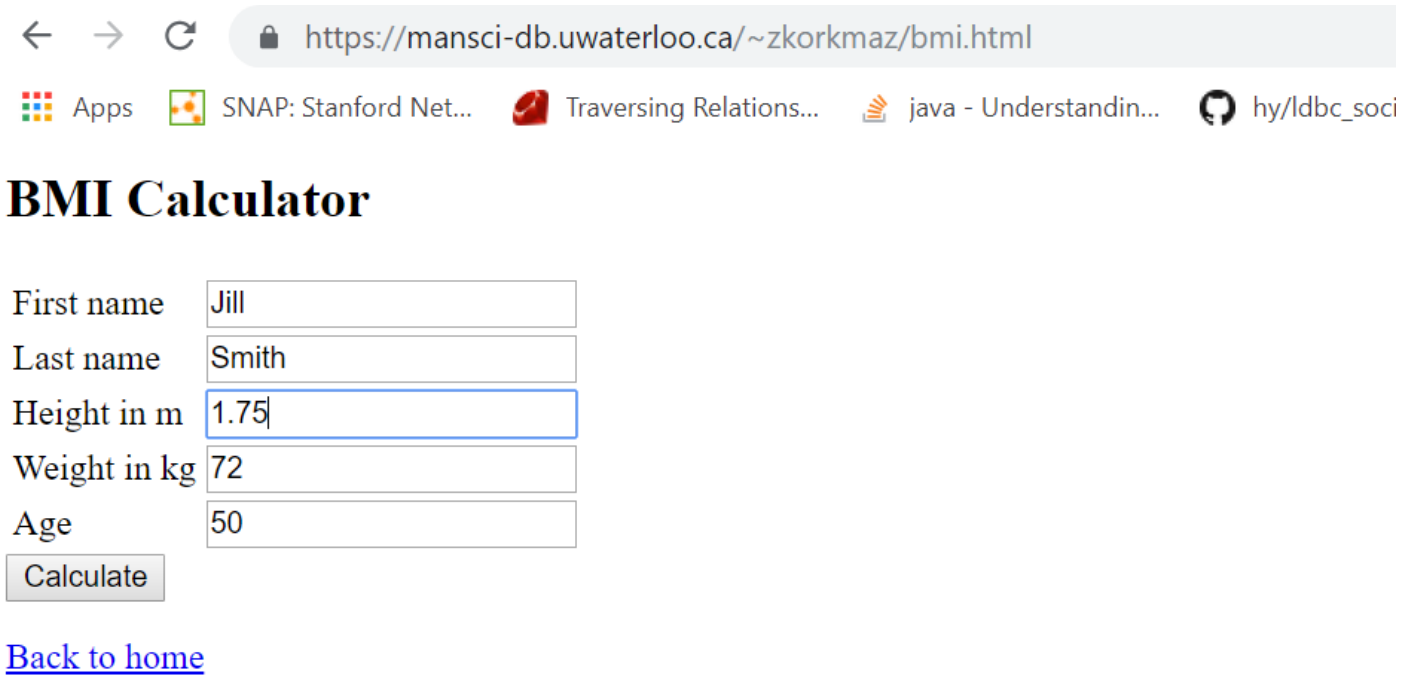
- Get patients name, age, weight and height as input
- Calculate BMI, and output the result including patient's information on a table.
- Output corresponding BMI category.

- BMI Calculation:
  - BMI applies to adults 18-65 years
  - **BMI** = kg/m^2

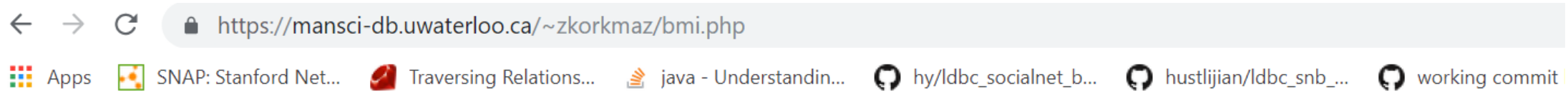
Standard BMI Categories

Weight Status Category	**BMI Range** (kg/m^2)
Underweight	Below 18.5
Healthy weight	18.5 to 24.9
Overweight	25 to 29.9
Obese	30 or greater

BMI Calculator



BMI Calculator



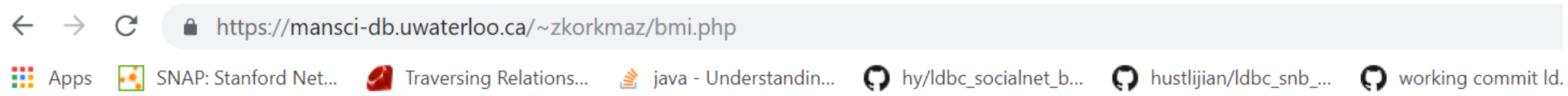
BMI Calculator

BMI Result

Firstname	Lastname	Age	BMI	Category
Jill	Smith	50	23.510204081633	Healthy weight

Back to BMI Calculator

BMI Calculator



BMI Calculator

BMI Result

Firstname	Lastname	Age	BMI	Category
Jill	Smith	68	BMI applies to adults 18-65 years	Not available

Back to BMI Calculator