TOI-OHOMAI Institute of Technology	**COMP.5202** **Fundamentals of Programming and Problem Solving**	**Testing Example: BMI Category Program**

BMI (Body Mass Index) Category Program – Testing Example

The BMI program used in this testing example is based on the BMI programs you developed in the "Functions" section of the course.

Files "BMI-Category.js" and "BMI-Category.html" are provided. ***The JavaScript is <u>not</u> necessarily bug free.***

Read the requirements of the program then complete the testing tasks for the program.

BMI Category Program - Requirements

PART A
Write a function that calculates the BMI. The functions should accept two arguments – the weight (*in **kilograms***) and the height (*in centimetres*). The function returns a number, ie. the BMI.

$$\boldsymbol{BMI = \frac{W}{H^2}}$$

$$\begin{aligned} &where \\ &\boldsymbol{W}\ is\ the\ weight\ in\ \boldsymbol{kg} \\ &\boldsymbol{H}\ is\ the\ height\ in\ \boldsymbol{m} \end{aligned}$$

PART B
Use a second function to determine the BMI category. This function should accept one argument – the BMI. The function returns a string, ie. the BMI Category.

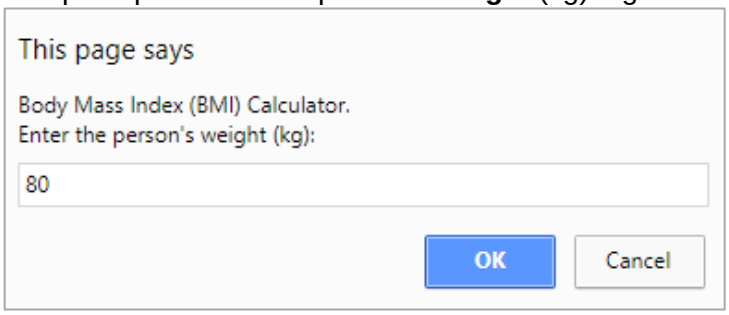
BMI Category	***Range of BMI***
Underweight	less than 18.5
Normal weight	greater than or equal to 18.5 but less than 25
Overweight	greater than or equal to 25 but less than 30
Obese	greater than or equal to 30

PART C

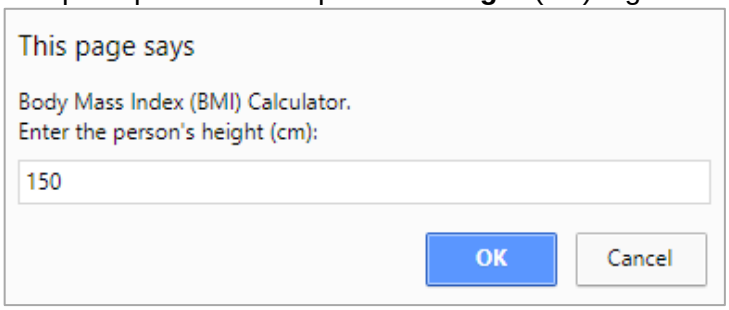
Use the functions you created in Parts A and B to write a program that uses a web page to prompt the user for the weight (***kilograms***) and the height (***centimetres***) and outputs the BMI (to one or two decimal places) and the BMI category to the browser console.

Use the following screen shots as a guide to how the program should operate.

Sample Input: Enter the person's **weight** (kg): eg. **80**



Sample Input: Enter the person's **height** (cm): eg. **150**



Sample Output (Browser Console): eg. **BMI of 35.6 and BMI Category of Obese**

```
Body Mass Index Calculator
--------------------------

Person's weight : 80 kg
Person's height : 150 cm
Body Mass Index : 35.6
-----------------------
BMI Category    : Obese
```

TESTING TASKS

1. Test Data

Think about what test data you need to create. The "**BMI_Generate_Test_Data.xlsx**" spreadsheet file may help you with determining test data for calculating the BMI.

In this exercise the "boundary" values for determining the BMI category are important! We need input test data (weight and height) that will test those boundary BMI values.

2. Black-Box Test

You are to black box test the BMI program supplied. To do this, use the html file to run the program and note the output provided for your test data.

3. White-Box Testing

After black box testing, open the **BMI-Category.js** program and white box test it. Find the errors in the logic. You may wish to use what you learnt using the node debugger and chrome debugger to help you.

4. What other testing should be done?

In the testing done until now we have used "valid" numbers for the weight and height. When we originally wrote the programs in the "Functions" section of the course we did very basic testing to see if the functions and the program basically worked given the very basic program requirements.

Further Testing Example:
If we were to properly test this program given ***more stringent requirements***, we would need to test for situations like:

- Weight and Height entered as numbers other than integers
- Height = 0
- Weight = 0
- Weight and Height both zero
- Weight and Height (either one or both) are entered as negative numbers
- Weight and Height (either one or both) are entered as a string or chars (not actual numeric data)

What else should you test for? Discuss amongst yourselves then bring it up in class.