

TEMASEK POLYTECHNIC
SCHOOL OF BUSINESS
BBT2002 Open Technology and Business Systems
INDIVIDUAL ASSIGNMENT SPECIFICATIONS

*A good programmer is someone who always looks both ways before crossing a one-way street.
-Doug Linder*

1. OBJECTIVES









- 1.1 The Individual Assignment assesses students' abilities to develop mobile applications in HTML, JavaScript, CSS and Cordova. Students are also required to use the jQuery and jQuery mobile libraries.
- 1.2 Students are required to apply programming concepts such as variables, functions, condition statements and iterations to develop a mobile Health App.
- 1.3 There are 2 modules to build, namely, the BMI Checker and the HIIT Planner.

2. Module: BMI Checker.

2.1 The user will enter the following fields into a form:

Field	Type	Remarks
Height	Text Field	Allow number with decimal places
Weight	Text Field	Allow number with decimal places
Gender	Select Menu	Select between Male and Female
Dream Weight	Text Field	Allow number with decimal places
Age	Text Field	Allow whole number
Exercise Frequency	Select Menu	Select between: <ul style="list-style-type: none">• Hardly Exercise• Exercise 1 to 2 times a week• Exercise 3 to 5 times a week• Exercise 6 to 7 times a week• Intensive Exercise more than 7 times a week

2.2 This is the user interface:

Health App - BMI		Health App - BMI	
 BMI Checker	 HIIT Planner	 BMI Checker	 HIIT Planner
Height	Weight	Height	Weight
<input type="text" value="in metres"/>	<input type="text" value="in KG"/>	<input type="text" value="1.7"/>	<input type="text" value="65"/>
Gender		Gender	
<div>Female </div>		<div>Female </div>	
Dream Weight	Age	Dream Weight	Age
<input type="text" value="in KG"/>	<input type="text" value="in whole number"/>	<input type="text" value="60"/>	<input type="text" value="6"/>
Exercise Frequency		Exercise Frequency	
<div>Hardly Exercise </div>		<div>Hardly Exercise </div>	
<div>Calculate</div>		<div>Calculate</div>	
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2.3 The BMI Checker will calculate the user's Body Mass Index (BMI) based on his/her weight and height.

$$\text{BMI} = (\text{Weight in Kilograms} / (\text{Height in Metres}) \times (\text{Height in Metres}))$$

2.4 The BMI Checker will classify the user's weight according to the BMI Classification Table as shown:

Weight	Classification
Less than 18.5	Underweight
18.5 to 24.99	Normal Weight
25 to 29.99	Overweight
30 to 34.99	Obese (class 1)
35 to 39.99	Obese (class 2)
40 or greater	Morbidly Obese

2.5 To calculate the necessary calories intake to maintain the user's current weight, you are required to calculate his/her Basal Metabolic Rate (BMR) with the following formula:

Women: $655 + (9.6 \times \text{weight in KG}) + (1.8 \times \text{height in cm}) - (4.7 \times \text{age in years})$

Men: $66 + (13.7 \times \text{weight in KG}) + (5 \times \text{height in cm}) - (6.8 \times \text{age in years})$

2.6 Next, based on the user's exercise frequency, use the following formula to calculate his/her daily calories needs with the following equation.

Hardly Exercise: Daily Calories Needs = $\text{BMR} \times 1.2$

Exercise 1 to 2 times per week: Daily Calories Needs = $\text{BMR} \times 1.375$

Exercise 3 to 5 times per week: Daily Calories Needs = $\text{BMR} \times 1.55$

Exercise 6 to 7 times per week: Daily Calories Needs = $\text{BMR} \times 1.725$

Exercise intensively more than 7 times per week: Daily Calories Needs = $\text{BMR} \times 1.9$

2.7 Calculate the difference between the user's dream weight and current weight.

2.8 If the user wishes to lose weight, calculate the number of days it take for him/her to achieve his/her target weight if he takes in 500 lesser calories per day. (500 calories = 0.064kg).

If the user wishes to gain weight, calculate the number of days it take for him/her to achieve his/her target weight if he takes in 500 more calories per day. (500 calories = 0.064kg).

2.9 Display the results of your calculation:

The screenshot shows a 'Result' dialog box with the following text:

- You are normal weight
- BMI:**22.49
- BMR:**1556.8
- Calories to maintain weight:**1868.16
- To achieve your target weight:**You need to lose 5kg
- Days to target weight (at 500 cal. per day):**78

Annotations on the right side of the dialog box:

- A line from 'Calories to maintain weight:1868.16' points to a box labeled 'Daily calories intake to maintain current weight'.
- A line from 'Days to target weight (at 500 cal. per day):78' points to a box labeled 'Days to achieve target weight'.
- A box labeled 'Difference between dream weight and current weight' is positioned to the right of the 'To achieve your target weight' line.

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3. Module: HIIT Planner

3.1 HIIT stands for High Intensity Interval Training.

“HIIT, or high-intensity interval training, is a training technique in which you give all-out, one hundred percent effort through quick, intense bursts of exercise, followed by short, sometimes active, recovery periods. This type of training gets and keeps your heart rate up and burns more fat in less time.”

- <https://dailyburn.com/life/fitness/high-intensity-hiit-workout/>

3.2 The user will enter the following fields into a form:

Field	Type	Remarks
Exercise Time	Text Field	Allow whole numbers
Repetitions	Text Field	Allow whole numbers

Work-to-Rest Ratio (Work)	Text Field	Allow whole numbers
Work-to-Rest Ratio (Rest)	Text Field	Allow whole numbers
Exercise	Select Menu	Select one: <ul style="list-style-type: none"> - Standing Mountain Climbers - Push Ups - Speed Squats - Plank -

3.3 This is the user interface.

Health App - HIIT

★ BMI Checker

🏷️ HIIT Planner

Exercise Time

in minutes

Repetitions

in whole numbers

Work-to-Rest Ratio

Work Rest

Exercise

Standing Mountain Climbers ▼

Plan

Load from Cloud

Save to Cloud

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Health App - HIIT

★ BMI Checker

🏷️ HIIT Planner

Exercise Time

60

Repetitions

10

Work-to-Rest Ratio

2 1

Exercise

Standing Mountain Climbers ▼

Plan

Load from Cloud

Save to Cloud

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3.4 Pressing the [Plan] button will generate a HIIT workout schedule.

Health App - HIIT

★
BMI Checker

📅
HIIT Planner

Columns...

Rep	Standing Mountain Climbers (sec.)	Rest (sec.)
1	240	120
2	240	120
3	240	120
4	240	120
5	240	120
6	240	120
7	240	120
8	240	120
9	240	120
10	240	120

Total Exercise Time: 40 minutes

Total Rest Time: 20 minutes

Total HIIT Time: 60 minutes

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State the exercise here.

This section must be generated in a table, using a loop.

3.5 Calculations are explained below:

To Calculate	Formula	Example
Time Per Rep	Exercise Time / Repetition, <i>(round off to the largest integer less than or equal to the given number)</i>	If Total Exercise Time is 60 minutes and you are doing 10 reps, then Time Per Rep is $60/10 = 6$ minutes.

		If Total Exercise Time is 56 minutes and you are doing 5 reps, then Time Per Rep is 11.2. Round this off to the largest integer that is less than or equal to 11.2, you get 11 minutes per rep.
Ratio of each part of the work-rest ratio	$\text{Time Per Rep} * 60 / (\text{Work Ratio} + \text{Rest Ratio})$ <i>(round off to the largest integer less than or equal to the given number)</i>	<p>If each rep is 6 minutes and Work-Rest-Ratio is 2:1 then:</p> <ul style="list-style-type: none"> a) 6 minutes X 60 = 360 secs b) 2 Work-Ratio + 1 Rest-Ratio = 3 c) 360 sec / 3 ratio = 120 sec <p>If each rep is 11 minutes and Work-Rest-Ratio is 7:2 then:</p> <ul style="list-style-type: none"> a) 11 minutes x 60 = 660 secs b) 7 Work-Ratio + 2 Rest-Ratio = 9 c) 660 sec / 9 ratio = 73.333. Round this off to the largest integer that is less than or equal to 73.333 you get 73 secs.
No. of secs for workout	Ratio of work * Ratio of each part of the work-rest ratio	<p>If Ratio of each part of the work-rest ratio = 120 sec, and work ratio is 2, then $120 * 2 = 240$ secs</p> <p>If Ratio of each part of the work-rest ratio = 73 sec, and work ratio is 7, then $73 * 7 = 511$ secs</p>
No. of secs for rest	Ratio of rest * Ratio of each part of the work-rest ratio	<p>If Ratio of each part of the work-rest ratio = 120 sec, and rest ratio is 1, then $120 * 1 = 120$ secs</p> <p>If Ratio of each part of the work-rest ratio = 73 sec, and rest ratio is 2, then $73 * 2 = 146$ secs</p>

Total exercise time	Sum the total time spent working out, in minutes.	If each workout rep is 240 secs and there are 10 reps, then $240 * 10 = 2400$ secs, which is 40 minutes.
Total rest time	Sum the total time spent resting, in minutes.	If each rest rep is 120 secs and there are 10 reps, then $120 * 10 = 1200$ secs, which is 20 minutes.
Total HIIT time	Total exercise time + Total rest time	If total exercise time is 40 minutes and total rest time is 20 minutes, then total HIIT time is $40 + 20 = 60$ minutes.

3.6 Pressing the [Save to Cloud] button will let the user save the following fields to your VPS account.

- Exercise Time
- Repetitions
- Work-to-Rest Ratio
- Exercise

3.7 Pressing the [Load from Cloud] button will let the user load the following fields from your VPS account.

- Exercise Time
- Repetitions
- Work-to-Rest Ratio
- Exercise

Refer to the codes in appendix 1 for the JSON web services for loading from cloud.

4. Requirements

Health App (30%)	Description <ul style="list-style-type: none"> • You are required to develop your system in HTML, JavaScript, CSS and Cordova. • You are also required to use the jQuery and jQuery Mobile libraries. • You are required to implement all the features stated in Section 2 and 3. • You are allowed to use HTML templates and/or images downloaded from the internet. Please give credit to the original creators of the works you use.
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	<p>Deadline & Deliverables</p> <ul style="list-style-type: none"> PPMR worksheet (Plan & Perform section only) due on 20th January 2019, 2359. Milestone check during the week of 28th January 2019. You are required to demonstrate the work that you have done till-date to your tutors. By this week, you should have been able to at the very minimum, have a working BMI Checker. Final Submission: 3rd February 2018, 2359: <ul style="list-style-type: none"> Source Codes Full PPMR worksheet (Plan, Perform, Monitor, Reflect) All submissions to be made in LMS.
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5. Assessment Criteria

5.1 This is an individual assignment and carries a weightage of 30%.

5.2 Late submissions will **not** be graded.

5.3. You will be assessed based on the following criteria:

Phase	Description	Score
Weight Management System (100 marks)	PPMR Worksheet	10
	Milestone Check	
	Module: BMI Checker:	25
	<p>Correctness</p> <ul style="list-style-type: none"> Correct implementation of features required in the assignment specifications. Correct output Bullet-proof data validation. Unique user interface. 	
	Module: HIIT Planner:	25
	<p>Correctness</p> <ul style="list-style-type: none"> Correct implementation of features required in the assignment specifications. Correct output 	

	<ul style="list-style-type: none"> Bullet-proof data validation. Unique user interface. 	
	Programming techniques <ul style="list-style-type: none"> Proper variable and function naming conventions. Application of programming concepts (such as functions, loops and conditions). Code readability. 	20
	Creativity and Initiative <ul style="list-style-type: none"> Additional features not mentioned in the assignment specification. 	20

(Plagiarism of work will result in **ZERO** marks for this project)

6. Appendix

6.1 Database table to store HIIT Planner form values:

```

1 -- phpMyAdmin SQL Dump
2 -- version 4.8.3
3 -- https://www.phpmyadmin.net/
4 --
5 -- Host: localhost:3306
6 -- Generation Time: Dec 18, 2018 at 02:58 PM
7 -- Server version: 5.6.41
8 -- PHP Version: 7.2.7
9
10 SET SQL_MODE = "NO_AUTO_VALUE_ON_ZERO";
11 SET AUTOCOMMIT = 0;
12 START TRANSACTION;
13 SET time_zone = "+00:00";
14
15
16 /*!40101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT */;
17 /*!40101 SET @OLD_CHARACTER_SET_RESULTS=@@CHARACTER_SET_RESULTS */;
18 /*!40101 SET @OLD_COLLATION_CONNECTION=@@COLLATION_CONNECTION */;
19 /*!40101 SET NAMES utf8mb4 */;
20
21 --
22 -- Database: `jacksonn_hiit`
23 --
24
25 -- -----
26
27 --

```

```

28 -- Table structure for table `hiit`
29 --
30
31 CREATE TABLE `hiit` (
32   `time` float NOT NULL,
33   `rep` int(11) NOT NULL,
34   `work` int(11) NOT NULL,
35   `rest` int(11) NOT NULL,
36   `exercise` varchar(50) NOT NULL,
37   `serial` int(11) NOT NULL
38 ) ENGINE=MyISAM DEFAULT CHARSET=utf8;
39
40 --
41 -- Dumping data for table `hiit`
42 --
43
44 INSERT INTO `hiit` (`time`, `rep`, `work`, `rest`, `exercise`, `serial`)
45 VALUES
46 (60, 10, 2, 1, 'Standing Mountain Climbers', 1);
47
48 --
49 -- Indexes for dumped tables
50 --
51
52 --
53 -- Indexes for table `hiit`
54 --
55 ALTER TABLE `hiit`
56   ADD PRIMARY KEY (`serial`);
57
58 --
59 -- AUTO_INCREMENT for dumped tables
60 --
61
62 --
63 -- AUTO_INCREMENT for table `hiit`
64 --
65 ALTER TABLE `hiit`
66   MODIFY `serial` int(11) NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=2;
67 COMMIT;
68
69 /*!40101 SET CHARACTER_SET_CLIENT=@OLD_CHARACTER_SET_CLIENT */;
70 /*!40101 SET CHARACTER_SET_RESULTS=@OLD_CHARACTER_SET_RESULTS */;
71 /*!40101 SET COLLATION_CONNECTION=@OLD_COLLATION_CONNECTION */;

```

6.2 Codes for global.php. Replace the database values with your own.

```

1 <?php
2 const server = "127.0.0.1";
3 const dbuser = "<your database username>";

```

```

4 const dbpw = "<your database password>";
5 const db = "<your database name>";
6 ?>

```

6.3 JSON Web Service: save.php.

Web Service	save.php
Purpose	Saves HIIT Planner values to the MySQL Database
Sample Call	https://jacksonng.org/codetest/save.php? time=60 &rep=10 &work=3 &rest=1 &exercise=Standing%20Mountain%20Climbers
Parameters Accepted	<ul style="list-style-type: none"> • time • rep • work • rest • exercise
Value Returned	<ul style="list-style-type: none"> • result: 1 on successful deletion • result: 0 deletion failed
Sample Output	[{"result": "1"}]

```

1 <?php
2 header('Access-Control-Allow-Origin: *');
3 header('Access-Control-Allow-Methods: GET, POST, PATCH, PUT, DELETE,
4 OPTIONS');
5 header('Access-Control-Allow-Headers: Origin, Content-Type, X-Auth-
6 Token');
7 header("Content-Type: application/json; charset=UTF-8");
8
9 error_reporting(E_ERROR);
10
11 include("global.php");
12
13 try{
14     $conn = new mysqli(server, dbuser, dbpw, db);
15     $time = $_GET["time"];
16     $rep = $_GET["rep"];
17     $work = $_GET["work"];
18     $rest = $_GET["rest"];
19     $exercise = $_GET['exercise'];
20
21     $query = "update hiit set time = $time, rep = $rep, work = $work,
22 rest = $rest, exercise = '$exercise'";

```

```

23 //echo $query;
24 $result = $conn->query($query);
25
26 if (!$result){
27     $json_out = "[" . json_encode(array("result"=>0)) .
28 "]" ;
29 }
30 else {
31     $json_out = "[" . json_encode(array("result"=>1)) .
32 "]" ;
33 }
34
35 echo $json_out;
36
37 $conn->close();
38 }
39 catch(Exception $e) {
40     $json_out = "[" . json_encode(array("result"=>0)) . "]" ;
41     echo $json_out;
42 }
43 ?>

```

6.4 JSON Web Service: load.php.

Web Service	load.php
Purpose	Load HIIT Planner values from the MySQL Database
Sample Call	https://jacksonng.org/codetest/load.php
Parameters Accepted	n.a.
Value Returned	<ul style="list-style-type: none"> • time • rep • work • rest • exercise
Sample Output	<pre>[{ "time": 60, "rep": 10, "work": 2, "rest": 1, "exercise": "Standing Mountain Climbers" }]</pre>

```

1 <?php
2 header('Access-Control-Allow-Origin: *');

```

```
3 header('Access-Control-Allow-Methods: GET, POST, PATCH, PUT, DELETE,
4 OPTIONS');
5 header('Access-Control-Allow-Headers: Origin, Content-Type, X-Auth-
6 Token');
7 header("Content-Type: application/json; charset=UTF-8");
8
9 include("global.php");
10
11 $conn = new mysqli(server, dbuser, dbpw, db);
12
13 $query = "select time, rep, work, rest, exercise from hiit";
14 $result = $conn->query($query);
15
16 $outp = "[";
17 while($rs = $result->fetch_array(MYSQLI_ASSOC)) {
18     if ($outp != "[") {$outp .= ",";}
19     $outp .= '{"time":'. $rs["time"].',';
20     $outp .= '"rep":'. $rs["rep"].',';
21     $outp .= '"work":'. $rs["work"].',';
22     $outp .= '"rest":'. $rs["rest"].',';
23     $outp .= '"exercise":'. $rs["exercise"].'"}';
24 }
25 $outp .= "]";
26
27 $conn->close();
28
29 echo($outp);
30 ?>
```

END