



Faculty of Engineering and Applied Science

## **Distributed Systems Assignment 2 - Taha Hashmat 100689792**

### **Part A - Main Report**

#### **Introduction**

For Assignment 2 of distributed systems, students were tasked with getting a flavour of the effort involved in designing and developing distributed applications using Java RMI. We were tasked with designing an application that would accomplish something useful and had some novel features as well as providing 5 unique remote methods (services) to clients.

#### **Application Idea**

As someone who struggles with health and weight on a daily basis, I decided to implement an application which would keep track of my BMI, BMR and exercise levels all in one place. For those unfamiliar, BMI is Body Mass Index, which tracks your weight to height ratio while BMR is an individual's Basal Metabolic Rate, which figures out how many calories a body burns daily. These measurements alongside recommended exercise levels can help an individual maintain and lose weight.

#### **Novel Features**

I ended up implementing quite a few novel features in the application. These are:

- Calculating an individual's BMI (Body Mass Index)
- Calculating an individual's BMR (Basal Metabolic Rate)
- Advising users on exercise levels in accordance with their BMR.
- Giving the user the option to enter their physical measurements in either the metric system or the imperial system, for user friendliness.

#### **Challenges and Solutions**

One of the main challenges I faced during this assignment was the implementation of Java RMI onto this assignment. I had to recall the principles used in Lab 2 to figure out how to get my application running, some of which you will see implemented in this assignment. One of the biggest challenges I ran into with the code included:

1. Error using `Scanner.nextLine()`. The in-built method would not work for my string input from the user and eventually I had to settle with changing the input to an integer and thus using `Scanner.nextInt()`.
2. Using void type for one of my methods when I should have used public String. I had to turn all of my print statements into return statements to get it to work.

## Part B - Testing

- Testing RMI Registry

```
Classes — rmiregistry — 80x24
```

```
(base) tahahashmat@MacBook-Pro Classes % rmiregistry  
^C%  
(base) tahahashmat@MacBook-Pro Classes % rmiregistry  
^C%  
(base) tahahashmat@MacBook-Pro Classes % rmiregistry  
^C%  
(base) tahahashmat@MacBook-Pro Classes % rmiregistry  
^C%  
(base) tahahashmat@MacBook-Pro Classes % rmiregistry  
^C%  
(base) tahahashmat@MacBook-Pro Classes % rmiregistry  
[ ^C%  
(base) tahahashmat@MacBook-Pro Classes % rmiregistry  
^C%  
(base) tahahashmat@MacBook-Pro Classes % rmiregistry
```

- Testing whether Server is running

```
Classes — java -Djava.security.policy=policy.txt HealthServer — 81x30
(base) tahahashmat@MacBook-Pro src % javac -d classes/ *.java

(base) tahahashmat@MacBook-Pro src % cd Classes
(base) tahahashmat@MacBook-Pro Classes % java -Djava.security.policy=policy.txt H
ealthServer

Server Ready - service is running...
█
```

- Testing infinite while loop to keep program running:

[illegible]

- Testing program termination on input of 0:

```
Classes — -zsh — 93x68
((base) tahahashmat@MacBook-Pro Classes % java HealthClient MacBook-Pro.local
Client Ready - remote stub active...
Welcome to HealthTrack, an application which offers you calculation based health services
Our services currently include calculating a users BMI, BMR and advising them on their daily
exercise needs
Please follow the instructions below

Which of our services would you like to access?

1. BMI Calculator
2. BMR Calculator
3. Daily Required Exercise Level

Please type in either 1, 2 or 3 in the following prompt. Enter 0 to Exit!
1

Now please choose between a measurement system for your preferred units.

1. Metric System
2. Imperial System

Type in either 1 or 2 in the following prompt:
1

Please enter your weight in kilograms:
80
Please enter your height in centimeters:
180

Your BMI is: 24.691358024691358

Which of our services would you like to access?

1. BMI Calculator
2. BMR Calculator
3. Daily Required Exercise Level

Please type in either 1, 2 or 3 in the following prompt. Enter 0 to Exit!
0
(base) tahahashmat@MacBook-Pro Classes %
```

- Testing BMI Functionality:

```
Classes — -zsh — 93x68
((base) tahahashmat@MacBook-Pro Classes % java HealthClient MacBook-Pro.local
Client Ready - remote stub active...
Welcome to HealthTrack, an application which offers you calculation based health services
Our services currently include calculating a users BMI, BMR and advising them on their daily
exercise needs
Please follow the instructions below

Which of our services would you like to access?

1. BMI Calculator
2. BMR Calculator
3. Daily Required Exercise Level

Please type in either 1, 2 or 3 in the following prompt. Enter 0 to Exit!
1

Now please choose between a measurement system for your preferred units.

1. Metric System
2. Imperial System

Type in either 1 or 2 in the following prompt:
1

Please enter your weight in kilograms:
80
Please enter your height in centimeters:
180

Your BMI is: 24.691358024691358
```

- Testing BMR Functionality:

```
Classes — java HealthClient MacBook-Pro.local — 93x68
((base) tahahashmat@MacBook-Pro Classes % java HealthClient MacBook-Pro.local
Client Ready - remote stub active...
Welcome to HealthTrack, an application which offers you calculation based health services
Our services currently include calculating a users BMI, BMR and advising them on their daily
exercise needs
Please follow the instructions below

Which of our services would you like to access?

1. BMI Calculator
2. BMR Calculator
3. Daily Required Exercise Level

Please type in either 1, 2 or 3 in the following prompt. Enter 0 to Exit!
2

Now please choose between a measurement system for your preferred units.

1. Metric System
2. Imperial System

Type in either 1 or 2 in the following prompt:
1

Please enter your weight in kilograms:
80
Please enter your height in centimeters:
180
Please enter your age in years:
21
Please enter your gender (1 for Male or 2 for Women):
1

Your BMR is: 1904.725calories
```



## - Testing Daily Required Exercise Level

```
Classes — java HealthClient MacBook-Pro.local — 93x68
[(base) tahahashmat@MacBook-Pro Classes % java HealthClient MacBook-Pro.local
Client Ready - remote stub active...
Welcome to HealthTrack, an application which offers you calculation based health services
Our services currently include calculating a users BMI, BMR and advising them on their daily
exercise needs
Please follow the instructions below

Which of our services would you like to access?

1. BMI Calculator
2. BMR Calculator
3. Daily Required Exercise Level

Please type in either 1, 2 or 3 in the following prompt. Enter 0 to Exit!
3

Now please choose between a measurement system for your preferred units.

1. Metric System
2. Imperial System

Type in either 1 or 2 in the following prompt:
1

Please enter your weight in kilograms:
80
Please enter your height in centimeters:
180
Please enter your age in years:
21
Please enter your gender:
1
Sedentary: little or no exercise
```