

UNIVERSITY OF MALAYA

EXAMINATION FOR THE DEGREE OF MASTER OF DATA SCIENCE

ACADEMIC SESSION 2022/2023 : SEMESTER II

WQD7004 : PROGRAMMING FOR DATA SCIENCE

LAB TEST

13 May 2023

Time: 1 Hour

INSTRUCTIONS TO CANDIDATE:

Answer **ALL** questions (10 marks)

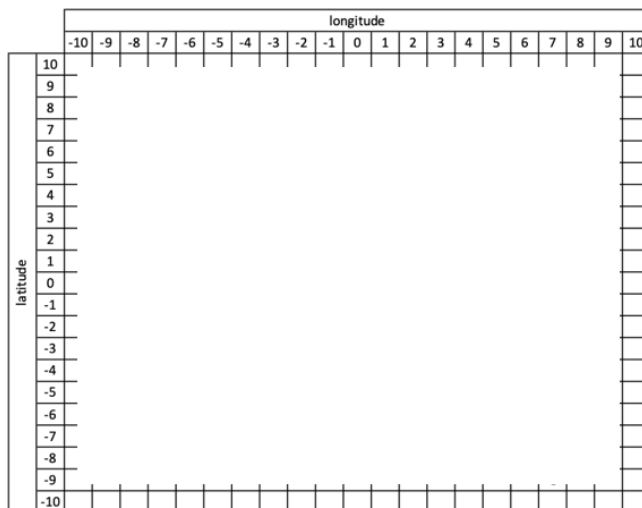
(This question paper consists of 2 questions on 3 printed pages)

1. Write R scripts that determine whether a number can be divided by 4. The scripts consist of a function named **isFactor** that contains one argument. The argument value is the matric number and the function will return TRUE if the **last THREE digits** of the matric number can be divided by 4 and FALSE otherwise. Example output

```
> isFactor("22061463")
[1] FALSE
>
> isFactor("52164604")
[1] TRUE
>
> isFactor("17153072")
[1] TRUE
>
```

(3 marks)

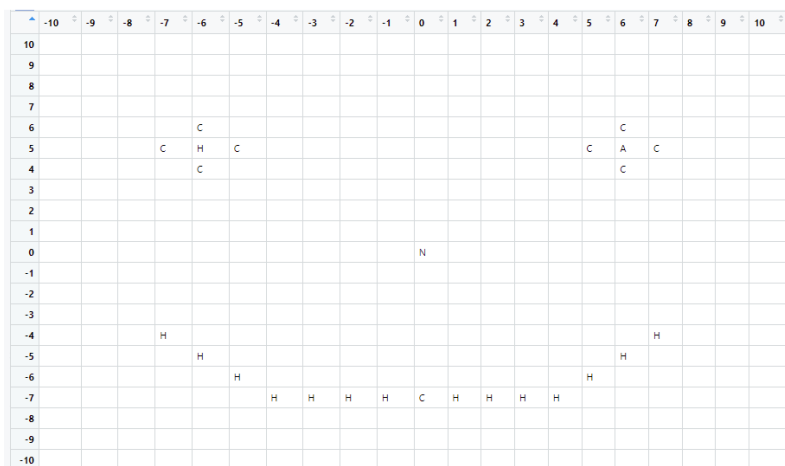
2. Write R scripts that display the heat map based on the data buoy. A data buoy is a significant component that used to monitor the collect atmospheric and oceanographic conditions. The scripts must consist of a data frame that read the data from **ocean.csv** file. The data are stored in the format: [buoy_id, latitude, longitude, air_temperature, water_temperature]. The latitude and longitude are integer numbers, within the range from -10 to 10 as figure below.



Display the average water temperature in two decimal place and show the heat map, where N is representing the Null Island (0,0), H is the location with water temperature higher than average, C is the location with water temperature lower than the average, and A, is the recorded temperature same as the average.

Example output.

[1] "Average Temperature 9.56"



(7 marks)

Create a **matricNumber.r** file, example **S2001234.r**. Copy your answer (question 1 and 2) to the file. Then, submit your answer using the submission link below:

https://docs.google.com/forms/d/e/1FAIpQLSeVC0zpxyK7xKrgp-DR48j6hyRUFFDNWANAIOkHf8A5w78eLA/viewform?vc=0&c=0&w=1&flr=0&usp=mail_form_link