NGEE ANN SCHOOL OF INFOCOMM TECHNOLOGY

PRG1	**Programming I** Diploma in CSF / IT / IM / DS / CICTP Year 1 (2023/24) Semester 1	Week **15** 60 minutes
Programming Aptitude Test 2 (10%)		

Instructions

Prior to test

- Create a folder on your desktop with your student id as the name
- Download the data file, **"trip_prices.txt"**, that you are using in this test to that folder with the same file name
- Create a python file in that folder with the following naming convention
  Test2_S12345678.py
  [replace S12345678 with your own student ID]
- In the file, enter your **name**, **id** and **group** in the first line as comment:
  e.g. *# John Tan (S12345678) – IT01*

Submission

- In POLITEMall, navigate to **Assessment** > **Aptitude Test 2 Submission**, upload your **.py** file that you have done for this test and click the "Submit" button.

Note: It is **your RESPONSIBILITY** to ensure that the file is submitted correctly

PLAGIARISM WARNING:

If a student is found to have submitted work not done by him/her, he/she will not be awarded any marks for this practical test. Disciplinary action may also be taken.

Similar action will be taken for student who allows other student(s) to copy his/her work, or posting any solutions or code related to the practical test before the end of the hour for the test.

Tom is helping his family to arrange for a trip to Japan at end of this year. In his research, a free and easy tour package "Tokyo-Hakone Getaway" caught his attention. He created a text file **"trip_prices.txt"** to store the information that he collated. The data file contains the prices for adult, child, extension as well as the optional land tour for various hotels as shown in figure 1 below. All prices are in Singapore Dollars.

```
HOTEL,A_TWN,A_SGL,CHD,EXT,LAND_A_TWN,LAND_A_SGL,LAND_CHD
A,1788,2888,1388,500,1188,2288,1278
B,1888,2988,1888,600,1288,2388,1378
C,2088,3688,2088,700,1488,3088,1578
```

Figure 1 – content of "trip_prices.txt"

Legend for the abbreviations in the data file:

A_TWN - Adult (Twin) [tour package price for 2 adults]
A_SGL - Adult (Single) [tour package price for 1 adult]
CHD – Child [tour package price for 1 child]
EXT - Extension (per night per room, each room can accommodate 2 pax) [price for the extension of stay per room per night, each room can accommodate up to 2 persons]
LAND_A_TWN - Land Tour for Adult (Twin) [land tour price for 2 adults]
LAND_A_SGL - Land Tour for Adult (Single) [land tour price for 1 adult]
LAND_CHD - Land Tour for Child [land tour price for 1 child]

Write a Python program to do the following (you are encouraged to use variables to store data that will be used in the program so as to make it dynamic):

(a) Read the data from the data file, **"trip_prices.txt"**, store it into a nested list, **trip_prices_list**, and print it out.

The output should be as follows:

```
Trip prices:
[['A', '1788', '2888', '1388', '500', '1188', '2288', '1278'], ['B',
'1888', '2988', '1888', '600', '1288', '2388', '1378'], ['C', '2088',
'3688', '2088', '700', '1488', '3088', '1578']]
```

(20 marks)

(b) In Tom's family trip, there will be 5 adults and 2 children. The family decides to opt for extension of 3 nights. Write code to display the number of tour package / land tour for different types of rooms as well as the number of rooms needed for extension per night, in the most economical way.

The output should be as follows:

```
Number of adults: 5
Number of children: 2
Number of extension: 3
Number of adult-twin for the tour package / land tour: 2
Number of adult-single for the tour package / land tour: 1
Number of children for the tour package / land tour: 2
Number of rooms for extension per night: 4
```

(20 marks)

(c) Using the **trip_prices_list** created in part (a) and the values found in part (b), calculate and display the amounts for various hotels, with and without the land tour, in the most affordable way.

The output should be as follows (the header should be obtained from the data file if available):

```
HOTEL A_TWN  A_SGL  CHD   EXT   LAND_A_TWN  LAND_A_SGL  LAND_CHD  Total Amount  Amount w Land Tour
A     1788   2888   1388  500   1188        2288        1278      15240         22460
B     1888   2988   1888  600   1288        2388        1378      17740         25460
C     2088   3688   2088  700   1488        3088        1578      20440         29660
```

You are to store the amounts, as the above calculations are done, in a nested list, **total_amt_list**, as follows:

[[15240, 22460], [17740, 25460], [20440, 29660]]

Note: If you are unable to complete part (a), you may initialize the nested list **trip_prices_list**, as shown in part (a) above and proceed with this part.

(35 marks)

(d) The family's budget for the trip is S$25000. Help Tom determine the options available and display the result.

The output should be as follows:

```
Options Available for SGD$25000 budget:
        Hotel A w/o land tour
        Hotel A w land tour
        Hotel B w/o land tour
        Hotel C w/o land tour
```

You are required to make use of the **total_amt_list** that you have created in part (c) in your program.

You are also required to make use of **nested loop** in your answer.

Note: If you are unable to complete part (c), you may initialize the nested list **total_amt_list**, as shown in part (c) above and proceed with this part.

(25 marks)

*** END OF PAPER ***