Department	**Final Exam C Introduction Lab (IT3220)** *ICT-20191– 90 minutes – Lecture notes and lab slides can be used* *(If copying other students' source code, you will get F grade)*	**TERM 2019-1**
	Name: ..... ID: …… Class ……..	

U23 ASIA CUP 2020. Asian Football Federation wants to build a program to manage the results of U23 Asia Cup 2020. Each group has information as follows:

- *GroupID*: group name (only one uppercase letter)
- *TeamName[]*: array of team names (for example: ["VietNam", "UAE", "Jordan", "NorthKorea"]). Team name does not contain space and its length is smaller than **20 characters**, and there are **4 teams in each group by default**.
- *Points[]*: array containing team points (for example: [3, 1, 0, 1]). Point is a **positive** integer number.
- *Goals[]*: array containing goal difference of each team (for example: [2, -2, 0, 0]). Goal difference is an integer number.
  Goal difference = the number of goals scored by a team minus the number of goals it has conceded, e.g. 3 goals và 5 conceded goals, so goal difference is -2.

Write a program to manage the results by using **a menu** with functionalities of below questions. The program has a menu of 1, 2, 3, 4, 5 and after finishing each functionality, the menu will be shown again (**1.5 point**):

1. Add groups (**3.5 point**): the number of groups input each time is bigger than or equal to 1 (N ≥ 1). It is possible to add new groups each time when users choose the menu 1. Note that the **total number of groups is not bigger than 8**. Therefore, when inputting N, if the total number of groups is bigger than 8, the program requires to input N again. The program must **validate input data**:
   - Each time input at least 1 group (N ≥ 1) and the total number of groups is not bigger than 8 (0.5 point)
   - Group name is uppercase, and there are no two groups having the same name (0.5 point)
   - One team cannot belong to two groups (1.0 point)
   - Point of each team is a positive number (0.5 point)
2. Print all groups' information in the following format (**1.0 point**):

Group A

Team	Point	Goal Difference
VietNam	9	10
UAE	1	1
Jordan	4	-3
NorthKorea	0	-8

Group B

Team	Point	Goal Difference
SouthKorea	6	5
Iran	1	1
Uzbekistan	4	3
China	0	-9

3. Find information of a team (**1.0 point**): Input a team name and show the result including group name, point, and goal difference. The program must check whether input team belongs to any group.

Example 1:
Input: VietNam
Result: Group A, 9 Point, 10 Goal difference
Example 2:
Input: Thailand
Result: No result

4. Input a match result, update its corresponding group, and print the group information in the same format as in question 2 (**1.5 point**). Input must in this format: **team_1 team_2 goal_1 goal_2**
The program must check whether two teams belong to the same group and match results are positive integer numbers.
For Example:
Input: VietNam UAE 5 1 → Result: print the group information
Input: China VietNam 0 10 → Result: Different group
*Note: Points for a team is calculated as follow: 3 points for a win, 1 point for a draw, 0 points for a loss)

5. Sort order in all groups and print in the same format as in question 2 (**1.5 point**): The teams' order is sorted by **point**. If the point is the same, it's sorted by **goal difference**. If the goal difference is the same, sorted by **alphabet**.
6. Exit the program