UNIVERSITY OF TECHNOLOGY, JAMAICA
School of Computing and Information Technology
Object-Oriented Programming Project

R. Clarke/C. Panther/A. Bowen-Mighty/H. Scarlett
Group Assignment (3-4 persons Per group)

Given Date: March 11, 2024, **Due Date: April 13, 2024**

Instructions:
This group project is designed to allow students working in groups to employ key OOP concepts in the analysis, design, and implementation of a real-world application. Students in groups should make use of composition, inheritance, polymorphism, dynamic binding, encapsulation, data abstraction, persistence through file handling, and defensive programming using exception-handling techniques.

The scenario for this project is as follows:
The Ministry of Entertainment and Sports (MES) would like you to create a Computerized System to automate all areas of sporting activities across Jamaica. The system will be a shared platform that will allow a total of 5(five) associations, 5 (five) clubs, and athletes. All Associations have unique identification numbers, addresses, and numbers of clubs and can perform the following tasks: add association, view association, and delete association. Athletes have a trn, first name, middle name, last name, gender, date of birth, height, weight, nationality, and club or they can be unaffiliated (unattached) to a club and whether they are affiliated to a sponsor(s). A sponsor has a name, an affiliated athlete's name, and the amount of sponsorship that is given to the respective athletes. The following tasks can be performed for an athlete: add an athlete, update an athlete's information, delete an athlete from a club, and add an athlete to a club. An athlete can switch clubs once per year. A club has a club code, club name, club colour, total membership, president, head coach, and associated association. A coach has a trn, full name, date of birth, gender, date of employment, date of separation, and commission from the athlete or club.

The system should have two main sections:
1. Administrator
2. User

Administrator
The administrator section is used by the administrator to manage associations, clubs, and athletes to manage their respective membership. When this section is selected, the user is given the option to select their association based on the sport they play (for example Football "Jamaica Football Federation" and Track and Field "Jamaica Athletes Administrative Association"). Each club is linked to an association. MVP and Racers are 2 clubs based in Jamaica. Athletes are members of clubs. Athletes include Shellyann Frazer-Price and Christopher Gayle.

User
The user section is designed to allow users (i.e., associations, clubs, and athletes) to be able to use the platform based on their sporting discipline. Athletes gain access to the club section through login with username and password. To access the athlete section an athlete uses their trn number as their username and "sportsForLife2024" as the default password.

Each section should have its login interface. Once a user is logged in, he/she can access the specific sections of the system according to his/ her access privileges. The following should be the available interfaces users will have access to once they have signed on:
- 1 interface for the public
- 3 interfaces for the administration sections for coaches, athletes, and clubs.
- 1interface for the System administrator to manage the system.
- 1 for programs offered by the ministry.
- 1 for the different sporting events
- 1 for salary (Month/ year)
- 1 for Demographics
- 1 for clubs
- 1 for Nationality
- 1 for sponsorship

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The admin Management Portal is designed to allow the System Administrator to perform the following functions:

- Association:
  - Create a new Association Account
  - Edit an Association account.
  - Delete an Association account.
  - Add a Club to an association account.
  - Delete a club account.
  - Produce a report for a single club.
  - Produce a report for all clubs.
- Club:
  - Create a new Club's Account
  - Edit a Club's account.
  - Produce a report for a single club.
  - Produce a report for all clubs.
  - Delete a club account.
- Athlete:
  - Create a new Athlete's Account
  - Edit an Athlete's account.
  - Delete an Athlete's account.
- Coach Section:
  - Create a new Coach Account.
  - Edit a Coach's account.
  - Delete a Coach's account.
- Sponsorship Donors
  - Add Sponsorship
  - Edit Sponsorship
  - Delete Sponsorship
  - Amount of the Sponsorship to each athlete.

The system should be able to create a report to include the following information per association:

- The number of Athletes in a club.
- The number of athletes with and without sponsorship
- The number of athletes in each federation.
- The number of unattached athletes.
- the number of athletes coached by a specific coach.

The system should be able to search for athletes and produce reports showing results.

Program Requirements:

1. Perform an Object-Oriented Analysis (OOA) on the proposed MES System described above. The OOA should clearly show the steps used to identify potential classes and the selection of the actual classes. Based on the OOA, create an Object-Oriented Design (OOD) using the Unified Modelling Language (UML). The OOD should show appropriate UML diagrams for all classes and the class relationship diagram, should show all relationships existing between the classes.

2. Using C++ or Java, implement the MES Automation System (MES-AS) as your group project.
3. The Administrator should maintain all platforms for all users of the system for associations, clubs, athletes, and sponsors using the following menu options:

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4. The admin should be able to maintain the Athlete's data via a menu with the options:
   - Athlete which is used to:
     - Add Athletes.
     - Update Athletes.
     - Add Clubs.
     - Edit Clubs.
     - Delete Clubs.

   i. Add: This allows the user to add a new athlete's data to the system.
   ii. Update: This allows the user to update an existing athlete's information.
   iii. View: This allows the user to view a single athlete's information.
   iv. View All: This allows the user to view all athlete information for a specified club or number of clubs in a specific association.
   v. Delete: This allows the user to delete an athlete's information.

5. When the exit option is selected the application should close.

6. All committed changes made during the execution of the program, should be stored, and used to update the relevant files when the application terminates, using persistent (sequential or random access) files.

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The following rubric will be used to mark this group project.

Grading Scheme (100 marks): **General Mark Breakdown**

No.	Section/Objective	Max. Mark(s)	Act. Mark(s)
1.	**DOCUMENTATION**		
1.1	Signed Authorship forms (i.e. one per group member)	2	2
1.2	Group Report (Outlining contribution of each group member)	3	3
1.3	Object-Oriented Analysis and Design of System	10	10
1.4	User Manual (Outline of how the program works including instructions on how to set up the program. This should be properly done to resemble a program already on the market)	5	4
	NB: Missing Authorship Forms and Group Report will result in a loss of 15 marks.		
	DOCUMENTATION SECTION TOTAL	**20**	
2.	**SOURCE CODE**		
2.1	Comments		
2.1.1	Each File(class) should have details for the students who wrote the file.	1	1
2.1.2	Practice the use of self-commenting files (i.e. proper variable and method naming convention taught in the module)	1	1
2.1.3	Proper use of inline and method comments where necessary	1	0.5
2.2	Naming Convention		
2.2.1	Pascal Case should be used for classes and method names	2	1.5
2.2.2	Camel Case should be used for attribute names	4	4
2.2.3	Ensure class Files are named appropriately as per instructions	1	1
2.3	Object-Oriented Programming Techniques		
2.3.1	Implementation of Inheritance in the program	3	3
2.3.2	Implementation of Composition in the program	3	3
2.3.3	Implementation of Method Overriding and Overloading in the program	6	3
2.3.4	Implementation of Polymorphism in the program	3	3
2.4.	Persistence using Files		
2.4.1	Proper Implementation of appropriate file management in the program	5	5
	SOURCE CODE SECTION TOTAL	**30**	
3.	**FUNCTIONALITY**		
3.1	Robustness of Program		
3.1.1	User Input validation checks should be seen where required	2	2
3.1.2	Implementation of Error Checks/ Exception Handling in the program	3	3
3.1.3	Clearly show how the Program Navigates (using consistent menus throughout)	2	1
3.2	Graphical User Interface		
3.2.1	Ease of User Interaction	6	4
3.2.2	Appropriate Notifications (i.e. error and information messages)	5	5
3.3	System Functionality Implementation		
3.3.1	Maintaining Associations data	8	8
3.3.2	Maintaining Clubs data	8	8
3.3.3	Maintaining Coaches data	8	8
3.3.4	Maintaining Athletes data	8	8
	FUNCTIONALITY SECTION TOTAL	**50**	
	FINAL PROJECT MARK	**100**	92

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Extra Marks (10 marks):
A project that satisfies the program's functional requirements can gain additional marks up to a maximum of 10 marks by implementing the additional requirements as follows:

Bonus Option:
Each athlete has an agent who negotiates with both the club and sponsors on behalf of their client. Each club gets an annual 10% fee from all athletes who are members through their sponsorship endorsements. All unattached athletes still pay a 10% annual fee, which is paid to their coaches directly. Coaches aligned to a club are paid directly by the clubs. Clubs must pay an annual 1% fee of their overall athletes' endorsement to the associations to which they are members. This fee is used to help plan seminars, workshops, and licensing events for athletes and coaches who are Jamaican nationals.

Please find a way to implement this section with the rest of the proposed solution for 10 additional marks.

Final Submission:

- Signed authorship forms, Group Reports, Object-Oriented Analysis and Design (OOA&D). Source Files and Executable to your Lab Tutor

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Late Submission:

- Any project submitted after the due date will be late and 10 % will be deducted for each day late. Late projects will not be considered for extra marks if extra marks are available.