

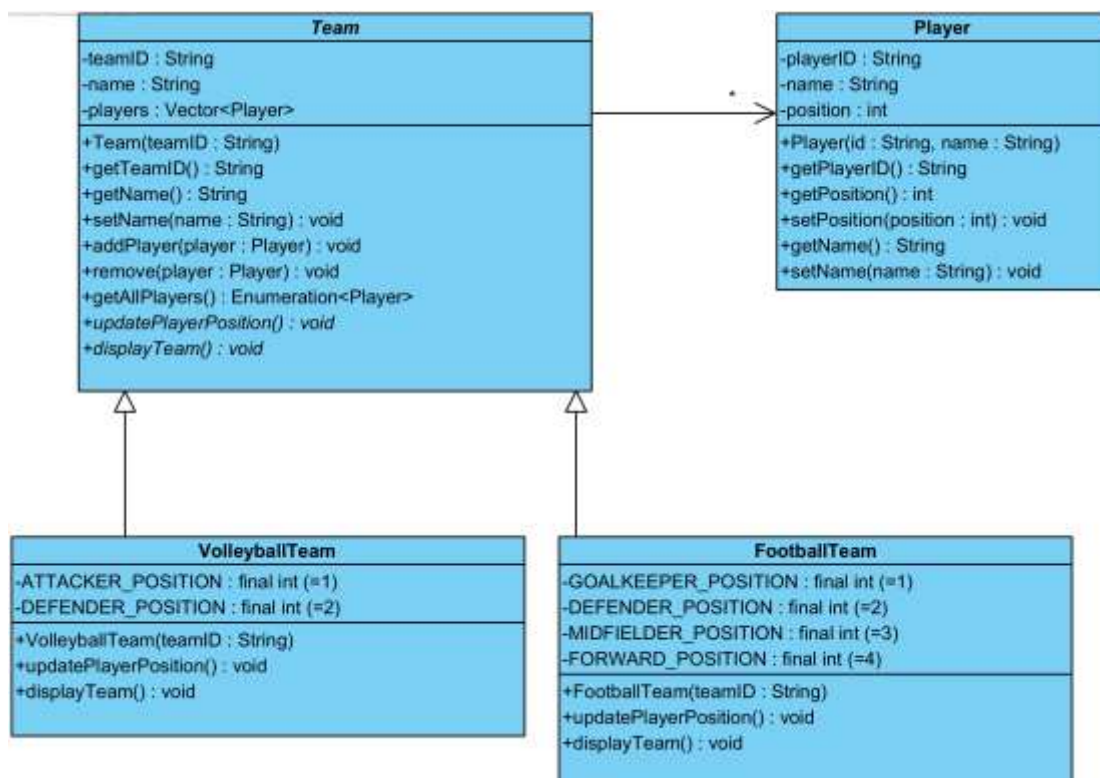
**HONG KONG INSTITUTE OF VOCATIONAL EDUCATION**  
**DEPARTMENT OF INFORMATION TECHNOLOGY**  
**HIGHER DIPLOMA IN SOFTWARE ENGINEERING (IT114105)**

Module Name: Contemporary Topics in Software Engineering  
Module Code: ITP4507  
Assignment Number: One  
Hand-in: **Friday 24 November, 2023** (On or before 4:30 PM to Moodle)  
Weighting of This Assignment: 50% of the End of Module Assessment

This assignment must be done by individual only. Plagiarism will be treated seriously. Any assignments that are found involved wholly or partly in plagiarism (no matter the assignments are from the original authors or from the plagiarists) will score Zero mark. **Late submission will NOT be accepted.**

### Task Specification

Magical Athletes Teams Management Company provides team sport management services on the web. The company manages various kinds of sport teams and players information over the world. The company plans to develop a Sport Teams Management System (STMS) to maintain the players in teams for different kinds of team sports. Currently, STMS supports volleyball and football. In the coming future, STMS will be extended to support more kinds of team sports. The following is the simplified class diagram of existing data maintained by STMS.



As a system analyst of the Company, you are required to design and develop STMS.

You are reminded that the design of the existing classes: Team, VolleyballTeam, FootballTeam, Player must be kept unchanged.

STMS should provide the following functions:

1. Create a Team record (VolleyballTeam, FootballTeam, or any new kind of team sports in the coming future).
2. Set the current team by Team ID.
3. Add a player to the current team
4. Modify the position of a player of the current team
5. Delete a player from the current team
6. Show the current team
7. Display all teams
8. Change the name of the current team
9. Undo last command
10. Redo the last undone command
11. Show undo/redo list
12. Exit System

Your system design should conform to the Open Closed Principle so that your design should easily be extended to support new sports (for examples, badminton, 4x100m, etc..).

You **MUST** apply the following design patterns for your new system

- **Command pattern** to provide the “create team”, “set current team”, “add player”, “modify player’s position”, “delete player”, “show current team”, “display all teams”, “change team’s name”. “undo”, “redo” and “show undo/redo list” functions
- **Factory pattern or Abstract Factory Pattern** to create different kinds of Command objects and different kinds of Team/Player objects (e.g., FootballTeam object, VolleyballTeam object, Player object, etc.)
- **Memento pattern** to provide “Undo” and “Redo” functions on the “modify player’s position” and “change team’s name” functions.

## Assignment Report

In addition to the system development, you are required to write up a **Short Report** covers the following sections:

1. **Assumptions regarding the problem context**
2. **Application design with class diagram**
3. **Discussion and explanation on each of the design patterns applied to the application**
4. **Test Plan and Test Cases**
5. **Well documented Source Code**

## Mark Allocation

Your assignment work will be marked according to the following criteria.

Work	Mark Allocated
System Coding and Implementation	
a) Implementation of the system and coding style <b>(Hard-coded output will result in zero mark.)</b>	30%
b) Correctness of system functions * <b>(Hard-coded output will result in zero mark.)</b>	15%
c) Test Plan and Test Cases (Will be used in testing your own application.)	10%
System Analysis and Design, and Discussion	
d) Design of your system and correct use of design patterns	20%
e) Application design with class diagram	10%
f) Discussion and explanation on each of the design patterns applied to the application	15%
Total	<b>100%</b>

Note: \* Please note that your source code will be recompiled and tested for the correctness of the system functions. Your implementation is required to support the 'Copy and Paste' method for testing which is described in page 16.

## Submission of Assignment Work

- The front page of your submission should include the **programme title(code), module title(code), and student number and student name.**
- Submit your Java source code and your report to <https://moodle.vtc.edu.hk> .
  - Well documented Source Code of your program.
  - Report for analysis, design, discussion, user guide, test plan and test cases of your following work.
    - The assumption made during analysis and design of the application
    - System design on your application with class diagram
    - Discussion on the design patterns that applied on your program
    - Test Plan with Test Cases (Design your own test plan and corresponding test cases for each function. For each test case, you should provide a SCREEN CAPTURE for test result).
- Submit according to the guideline on the top part of cover page. **Late submission will NOT be accepted.**

## Extra Reference: Sample Test

### Testing Method

This sample run is served for reference only. You are free to design your own user interface. But to make the testing environment simple and to apply the "Copy and Paste" testing method described on **page 16** easily, you are advised to accept user input at the command prompt as shown in the sample run below.

### Sample Run of assignment

You may follow the design of user interface shown in this sample run in DOS command prompt.

For following examples, character(s) with underline is user's input.

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#### 1. Create team a volleyball

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :- c

Enter sport type (v = volleyball | f = football) :- v

Team ID:- T001

Team Name:- TYV

Volleyball team is created.

Current team is changed to T001.

#### 2. Add players to the volleyball team

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :- a

Please input player information (id, name):- p001, peter pang

Position (1 = attacker | 2 = defender ):- 1

Player is added.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :- a

Please input player information (id, name):- p002, john law

Position (1 = attacker | 2 = defender ):- 2

Player is added.

### 3. Show the current team

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-s

Volleyball Team TYV (T001)

Attacker:

p001, peter pang

Defender:

p002, john law

### 4. Create team a football team and display all teams

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-c

Enter sport type ( v = volleyball | f = football) :- f

Team ID:- T102

Team Name:- KCF

Football team is created.

Current team is changed to T102.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-p

Volleyball Team TYV (T001)

Football Team KCF (T102)

## 5. Add players to the football team

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-a

Please input player information (id, name):- p101, albert fung

Position (1 = goal keeper | 2 = defender | 3 = midfielder | 4 = forward):- 1

Player is added.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-a

Please input player information (id, name):- p102, jacob wong

Position (1 = goal keeper | 2 = defender | 3 = midfielder | 4 = forward):- 2

Player is added.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-a

Please input player information (id, name):- p103, chris lee

Position (1 = goal keeper | 2 = defender | 3 = midfielder | 4 = forward):- 3

Player is added.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-a

Please input player information (id, name):- p104, robert chan

Position (1 = goal keeper | 2 = defender | 3 = midfielder | 4 = forward):- 4

Player is added.

## 6. Show the current team

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :**s**

Football Team KCF (T102)

Goal keeper:

p101, albert fung

Defender:

p102, jacob wong

Midfielder:

p103, chris lee

Forward:

p104, robert chan

## 7. Set the current team by Team ID

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :**g**

Please input team ID:- **T001**

Changed current team to T001.

## 8. Display all teams

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :**p**

Volleyball Team TYV (T001)

Football Team KCF (T102)

## 9. Add player

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-a

Please input player information (id, name):- p003, ming chan

Position (1 = attacker | 2 = defender ):- 1

Player is added.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-s

Volleyball Team TYV (T001)

Attacker:

p001, peter pang

p003, ming chan

Defender:

p002, john law

## 10. Modify player's position

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-m

Please input player ID:- p001

Position (1 = attacker | 2 = defender ):- 2

Position is updated.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.



Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] : -s

Volleyball Team TYV (T001)

Attacker:

p003, ming chan

Defender:

p001, peter pang

p002, john law

## 11. Delete player

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] : -d

Please input player ID:- p001

Player is deleted.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] : -s

Volleyball Team TYV (T001)

Attacker:

p003, ming chan

Defender:

p002, john law

## 12. Change the name of the current team

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] : -t

Please input new name of the current team:- STV

Team's name is updated.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 STV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] : s

Volleyball Team STV (T001)

Attacker:

p003, ming chan

Defender:

p002, john law

### 13. Show undo/redo list

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] : l

Undo List

Create volleyball team, T001, TYV

Add player, p001, peter pang, attacker

Add player, p002, john law, defender

Create football team, T102, KCF

Add player, p101, albert fung, goal keeper

Add player, p102, jacob wong, defender

Add player, p103, chris lee, midfielder

Add player, p104, robert chan, forward

Add player, p003, ming chan, attacker

Modify player's position, p001, defender

Delete player, p001

Change team's name, T001, STV

-- End of undo list --

Redo List

-- End of redo list --

## 14. UNDO actions in UNDO list

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 STV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] : -u

Command (Change team's name, T001, STV) is undone.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] : -s

Volleyball Team TYV (T001)

Attacker:

p003, ming chan

Defender:

p002, john law

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] : -u

Command (Delete player, p001) is undone.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] : -s

Volleyball Team TYV (T001)

Attacker:

p003, ming chan

Defender:

p001, peter pang

p002, john law

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-u

Command (Modify player's position, p001, defender) is undone.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-s

Volleyball Team TYV (T001)

Attacker:

p001, peter pang

p003, ming chan

Defender:

p002, john law

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-u

Command (Add player, p003, ming chan, attacker) is undone.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-u

Command (Add player, p104, robert chan, forward) is undone.

The current team is changed to T102 KCF.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :s

Football Team KCF (T102)

Goal keeper:

p101, albert fung

Defender:

p102, jacob wong

Midfielder:

p103, chris lee

Forward:

NIL

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :u

Command (Add player, p103, chris lee, midfielder) is undone.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :u

Command (Add player, p102, jacob wong, defender) is undone.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :u

Command (Add player, p101, albert fung, goal keeper) is undone.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :u

Command (Create football team, T102, KCF) is undone.

The current team is changed to T001 TYV.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-g

Please input team ID:- T102

Team 102 is not found!!

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-l

Undo List

Create volleyball team, T001, TYV

Add player, p001, peter pang, attacker

Add player, p002, john law, defender

-- End of undo list --

Redo List

Change team's name, T001, STV

Delete player, p001

Modify player's position, p001, defender

Add player, p003, ming chan, attacker

Add player, p104, robert chan, forward

Add player, p103, chris lee, midfielder

Add player, p102, jacob wong, defender

Add player, p101, albert fung, goal keeper

Create football team, T102, KCF

-- End of redo list -

## 15. REDO actions in REDO list

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :**r**

Command (Create football team, T102, KCF) is redone.

The current team is changed to T102.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :**r**

Command (Add player, p101, albert fung, goal keeper) is redone.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :**s**

Football Team KCF (T102)

Goal keeper:

p101, albert fung

Defender:

NIL

Midfielder:

NIL

Forward:

NIL

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :**l**

Undo List

```
Create volleyball team, T001, TYV
Add player, p001, peter pang, attacker
Add player, p002, john law, defender
Create football team, T102, KCF
Add player, p101, albert fung, goal keeper
-- End of undo list --

Redo List

Change team's name, T001, STV
Delete player, p001
Modify player's position, p001, defender
Add player, p003, ming chan, attacker
Add player, p104, robert chan, forward
Add player, p103, chris lee, midfielder
Add player, p102, jacob wong, defender
-- End of redo list --
```

- **END OF SAMPLE TEST** -



You can ease the testing by using the '**Copy and Paste**' method rather than inputting data manually. Prepare a text file, which includes all user inputs in a test run. By using the '**Copy and Paste**' method, you can automatically input in the command prompt window and then get the result automatically (without the input data echoed). The following is an example of the text file for user inputs.

***Sample User Inputs for a Test Run***

```
c
v
T001
TYV
a
p001, peter pang
1
a
p002, john law
2
s
c
f
T102
KCF
p
a
p101, albert fung
1
a
p102, jacob wong
2
a
p103, chris lee
3
a
p104, robert chan
4
s
g
T001
p
a
p003, ming chan
1
s
m
p001
2
S
d
p001
s
t
STV
s
l
u
```

```

s
u
s
u
s
u
u
s
u
u
u
g
l
r
r
s
l
x

```

### ***Expected Output of the Test Run***

```

Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Enter sport type ( v = volleyball | f = football) :-
Team ID:-
Team Name:-
Volleyball team is created.
Current team is changed to T001.
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T001 TYV.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Please input player information (id, name):-
Position (1 = attacker | 2 = defender ):-
Player is added.
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit systemThe current
team is T001 TYV.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Please input player information (id, name):-
Position (1 = attacker | 2 = defender ):-
Player is added.
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system

```

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Volleyball Team TYV (T001)

Attacker:

p001, peter pang

Defender:

p002, john law

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Enter sport type ( v = volleyball | f = football) :- f

Team ID:- T102

Team Name:- KCF

Football team is created.

Current team is changed to T102.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Volleyball Team TYV (T001)

Football Team KCF (T102)

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Please input player information (id, name):-

Position (1 = goal keeper | 2 = defender | 3 = midfielder | 4 = forward):-

Player is added.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Please input player information (id, name):-

Position (1 = goal keeper | 2 = defender | 3 = midfielder | 4 = forward):-

Player is added.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Please input player information (id, name):-

Position (1 = goal keeper | 2 = defender | 3 = midfielder | 4 = forward):-

Player is added.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system  
The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Please input player information (id, name):-

Position (1 = goal keeper | 2 = defender | 3 = midfielder | 4 = forward):-

Player is added.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Football Team KCF (T102)

Goal keeper:

p101, albert fung

Defender:

p102, jacob wong

Midfielder:

p103, chris lee

Forward:

p104, robert chan

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Please input team ID:-

Changed current team to T001.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Volleyball Team TYV (T001)

Football Team KCF (T102)

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Please input player information (id, name):-

Position (1 = attacker | 2 = defender ):-

Player is added.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Volleyball Team TYV (T001)

Attacker:

p001, peter pang

p003, ming chan

Defender:

p002, john law

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Please input player ID:-

Position (1 = attacker | 2 = defender ):-

Position is updated.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Volleyball Team TYV (T001)

Attacker:

p003, ming chan

Defender:

p001, peter pang

p002, john law

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Please input player ID:-

Player is deleted.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Volleyball Team TYV (T001)

Attacker:

p003, ming chan

Defender:

p002, john law

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Please input new name of the current team:-

Team's name is updated.

Sport Teams Management System (STMS)

```

c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T001 STV.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Volleyball Team STV (T001)
Attacker:
p003, ming chan
Defender:
p002, john law
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T001 TYV.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Undo List
Create volleyball team, T001, TYV
Add player, p001, peter pang, attacker
Add player, p001, john law, defender
Create football team, T102, KCF
Add player, p101, albert fung, goal keeper
Add player, p102, jacob wong, defender
Add player, p103, chris lee, midfielder
Add player, p104, robert chan, forward
Add player, p003, ming chan, attacker
Modify player's position, p001, defender
Delete player, p001
Change team's name, T001, STV
-- End of undo list --
Redo List
-- End of redo list --
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T001 STV.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Command (Change team's name, T001, STV) is undone.
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T001 TYV.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Volleyball Team TYV (T001)
Attacker:
p003, ming chan
Defender:
p002, john law
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T001 TYV.

```

```

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Command (Delete player, p001) is undone.
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T001 TYV.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Volleyball Team TYV (T001)
Attacker:
p003, ming chan
Defender:
p001, peter pang
p002, john law
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T001 TYV.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Command (Modify player's position, p001, defender) is undone.
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T001 TYV.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Volleyball Team TYV (T001)
Attacker:
p001, peter pang
p003, ming chan
Defender:
p002, john law
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T001 TYV.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Command (Add player, p003, ming chan, attacker) is undone.

Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T001 TYV.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Command (Add player, p104, robert chan, forward) is undone.
The current team is changed to T102 KCF.
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T102 KCF.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

```

Football Team KCF (T102)

Goal keeper:

p101, albert fung

Defender:

p102, jacob wong

Midfielder:

p103, chris lee

Forward:

NIL

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Command (Add player, p103, chris lee, midfielder) is undone.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Command (Add player, p102, jacob wong, defender) is undone.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Command (Add player, p101, albert fung, goal keeper) is undone.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T102 KCF.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Command (Create football team, T102, KCF) is undone.

The current team is changed to T001 TYV.

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Please input team ID:- T102

Team 102 is not found!!

Sport Teams Management System (STMS)

c = create team, g = set current team, a = add player, m = modify player's position, d = delete player, s = show team, p = display all teams, t = change team's name, u = undo, r = redo, l = list undo/redo, x = exit system

The current team is T001 TYV.

Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-

Undo List

Create volleyball team, T001, TYV

Add player, p001, peter pang, attacker



```

Add player, p001, john law, defender
-- End of undo list --
Redo List
Change team's name, T001, STV
Delete player, p001
Modify player's position, p001, defender
Add player, p003, ming chan, attacker
Add player, p104, robert chan, forward
Add player, p103, chris lee, midfielder
Add player, p102, jacob wong, defender
Add player, p101, albert fung, goal keeper
Create football team, T102, KCF
-- End of redo list --
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T001 TYV.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Command (Create football team, T102, KCF) is redone.
The current team is changed to T102.
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T102 KCF.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Command (Add player, p101, albert fung, goal keeper) is redone.
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T102 KCF.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Football Team KCF (T102)
Goal keeper:
p101, albert fung
Defender:
NIL
Midfielder:
NIL
Forward:
NIL
Sport Teams Management System (STMS)
c = create team, g = set current team, a = add player, m = modify player's
position, d = delete player, s = show team, p = display all teams, t = change
team's name, u = undo, r = redo, l = list undo/redo, x = exit system
The current team is T102 KCF.
Please enter command [ c | g | a | m | d | s | p | t | u | r | l | x ] :-
Undo List
Create volleyball team, T001, TYV
Add player, p001, peter pang, attacker
Add player, p001, john law, defender
Create football team, T102, KCF
Add player, p101, albert fung, goal keeper

```

```
-- End of undo list --  
Redo List  
Change team's name, T001, STV  
Delete player, p001  
Modify player's position, p001, defender  
Add player, p003, ming chan, attacker  
Add player, p104, robert chan, forward  
Add player, p103, chris lee, midfielder  
Add player, p102, jacob wong, defender  
-- End of redo list --
```

## Requirement for Scanner usage

### Wrong Scanner usage (more than one object of Scanner is created for reading keyboard input):

```
// create new Scanner objects in loop
do {
    Scanner sc = new Scanner( System.in);
    choice = sc.nextInt();
} while (choice != 1);
```

### Correct Scanner usage (only one Scanner object is created for reading keyword input):

Following is an example program to use a Global Scanner object or pass as a parameter to do the input.

```
import java.util.Scanner;

public class Test {
    //Global declaration for Scanner
    public static Scanner sc = new Scanner(System.in);

    public static void main(String args[]) {
        int x;
        System.out.print("Enter x:");
        x = sc.nextInt();
    }

    public static void method1() {
        int y;
        System.out.print("Enter y:");
        y = sc.nextInt();
    }

    public static void method2(Scanner sc) {
        int y;
        System.out.print("Enter y:");
        y = sc.nextInt();
    }
}
```

\*\*\* END \*\*\*