## Chapter 14

### End of Chapter Exercises

1. **Add a method to the Player class (Figure 14.1) called WinLoseRatio which has no parameters but which returns a real value which is ratio of the number of wins to losses (i.e. numberGamesWon/numberGamesLost).**

   ```
   METHOD WinLoseRatio RETURNS real
   IF (numberGamesLost > 0) AND (numberGamesWon > 0)
      RETURN numberGamesWon + numberGamesLost;
   ELSE
      RETURN numberGamesWon;
   ENDIF
   ENDMETHOD
   ```

2. **Assume the Player object rxforward has already been instantiated and the real player has played a number of online games. Write an IF...ELSE statement which calls rxforward's WinLoseRatio method (see exercise 1 above) and displays “Congratulations, you have a good Win:Lose ratio” if the ratio is greater than 1.0, otherwise “Sorry, your Win:Lose ratio is low and you need more practice”.

   ```
   IF rxforward.WinLoseRatio > 1.0
      Display ('Congratulations, you have a good Win:Lose ratio');
   ELSE
      Display ('Sorry, your Win:Lose ratio is low and you need more practice');
   ENDIF
   ```

3. **Say we learn that the game has been modified so that there are now two classes of player: normal and league. The Win:Lose ratio for normal players is the same as before, but for league players (those who have signed up for a premium content game with competitions and prizes) the Win:Lose ratio is only based on the number of league games lost and won. League players may join ‘normal’ players in a game but such games will not count towards their ratio. Declare a new class LeaguePlayer which inherits from Player but overrides the WinLoseRatio class to conform to the new system.

   ```
   CLASS: LeaguePlayer EXTENDS Player
   // Properties
   string:name;
   integer:numLeagueGamesPlayed,
      numLeagueGamesWon,
      numLeagueGamesLost;
   // Constructors
   ```
METHOD Player (string: aName)
    Super (aName);
ENDMETHOD

METHOD WinLoseRatio RETURNS real
    IF (numLeagueGamesLost > 0) AND (numLeagueGamesWon > 0)
        RETURN numLeagueGamesWon ÷ numLeagueGamesLost;
    ELSE
        RETURN numLeagueGamesWon;
    ENDIF
ENDMETHOD

METHOD WinLoseRatio RETURNS real
    // rest of the methods, as before
    . . .
ENDCLASS

Projects
No solutions provided as they will be highly dependent on how you have structured your own solutions over the previous chapters.