```cpp
/*
Daniel Avila May 6th, 2019 Section 19
Lab 13: Athlete Salaries
Description: Use of exception handling to verify user input and
Description: runtime polymorphism to ensure virtual abstraction.
*/
#include "Athlete.h"
#include "NBA.h"
#include "NHL.h"
#include "MLB.h"
#include <memory>

int main()
{   //instance of just one Athlete where its object is null because it is
    //dependent on the user's input to make a pointer of a derived class
    shared_ptr<Athlete> unknown = nullptr;

    int sportChoice;//for league choice
    double salary;//income for athlete
    cout << "Which Sport does the athlete play ?" << endl;
    cout << "(1 - 3)" << endl;
    cout << "1 : NBA" << endl;
    cout << "2 : MLB" << endl;
    cout << "3 : NHL" << endl;
    cin >> sportChoice;//user choosing from 1-3
    while (!(sportChoice >= 1 && sportChoice <= 3))
    {//validates the user input to be between 1 and 3
        cout << "Invalid sport option! Try again:" << endl;
        cin >> sportChoice;
    }
    if (sportChoice == 1)
    {//NBA league choice
        cout << "What is the Athlete's Salary?" << endl;
        cin >> salary;//user input of income for player
        unknown = make_shared<NBA>("NBA", salary);
        //the object now makes a pointer using the NBA
        //derived class with the input parameters
    }
    else if (sportChoice == 2)
    {//MLB league choice
        cout << "What is the Athlete's Salary?" << endl;
        cin >> salary;//user input of income for player
        unknown = make_shared<MLB>("MLB", salary);
        //the object now makes a pointer using the MLB
        //derived class with the input parameters
    }
    else if (sportChoice == 3)
    {//NHL league choice
        cout << "What is the Athlete's Salary?" << endl;
        cin >> salary;//user input of income for player
        unknown = make_shared<NHL>("NHL", salary);
        //the object now makes a pointer using the NHL
```

```
53          //derived class with the input parameters
54      }
55      unknown->pickLeaguePosition();//object calls class function
56                                    //for position in that league
57      cout << "Athlete Data: " << unknown->getAthleteSport() << " ";
58                           //gets league (NBA, MLB, NHL) to display
59      cout << unknown->getAthletePosition() << endl;
60                         //gets position specific to the league to display
61      unknown->displayLeagueSalaryData();//function compares user
62      //input salary to the rest of the league in a percentage
63
64      system("pause>nul");
65      return 0;
66  }
```

```
#ifndef ATHLETE_H
#define ATHLETE_H
#include <iostream>
#include <string>
#include <iomanip>
using namespace std;

class Athlete
{
protected:
    double salary;
    string position;
    string league;
public:
    Athlete(string sport, double sal)
    {
        salary = sal;//parameter set to protected variable
        league = sport;//parameter set to protected variable
    }
    virtual void pickLeaguePosition() = 0;//test for abstraction function
    virtual void displayLeagueSalaryData() = 0;//test for abstraction function
    string getAthletePosition()
    {
        return position;//returns position for specific league
    }
    string getAthleteSport()
    {
        return league;//returns the league (NBA, MLB, NHL)
    }
};
#endif // !ATHLETE_H

```

```cpp
#ifndef NHL_H
#define NHL_H
#include "Athlete.h"

class NHL : public Athlete//to inherit from base class
{
public:
    NHL(string sport, double salary) : Athlete(sport, salary)
    {//inherits from base class overloaded constructor

    }
    virtual void pickLeaguePosition()
    {//test for abstraction function
        int positionChoice;//for user input of 1-4
        cout << "What position does the athlete play?" << endl;
        cout << "(1-4)" << endl;
        cout << "1. Center" << endl;
        cout << "2. Winger" << endl;
        cout << "3. Defenseman" << endl;
        cout << "4. Goalie" << endl;
        cin >> positionChoice;
        try//to test valid input by the user by error enforcement
        {
            if (!(positionChoice >= 1 && positionChoice <= 5))
            {//throws the error message for it to catch if it is not 1-5
                throw string("Invalid input! Setting default value to 1");
            }
            else if (positionChoice == 1)
            {
                position = "Center";
            }
            else if (positionChoice == 2)
            {
                position = "Winger";
            }
            else if (positionChoice == 3)
            {
                position = "Defenseman";
            }
            else if (positionChoice == 4)
            {
                position = "Goalie";
            }
        }
        catch (string exceptionString)
        {
            cout << exceptionString << endl;
            position = "Center";//the default position in case it's not 1-5
        }
    }
    virtual void displayLeagueSalaryData()
    {//test for abstraction function
```

```
53          double leagueAvg = 2620000.00;//average salary for an NHL athlete
54          cout << "This Athlete's salary of $" << fixed << setprecision(2) << salary
               << " compares to ";
55          cout << fixed << setprecision(2) << ((salary / leagueAvg) * 100) << "% of
              the average ";//for a percentage out of 100
56          cout << league << " player's salary of $" << fixed << setprecision(2) <<
              leagueAvg << endl;
57      }//displays the variables and set to USD standard of cents; compares salary to
           league average in a percentage
58  };
59  #endif // !NHL_H
```

```
Which Sport does the athlete play ?
(1 - 3)
1 : NBA
2 : MLB
3 : NHL
3
What is the Athlete's Salary?
2500000
What position does the athlete play?
(1-4)
1. Center
2. Winger
3. Defenseman
4. Goalie
3
Athlete Data: NHL Defenseman
This Athlete's salary of $2500000.00 compares to 95.42% of the average NHL player's salary of $2620000.00
```

```
#ifndef MLB_H
#define MLB_H
#include "Athlete.h"

class MLB : public Athlete//to inherit from base class
{
public:
    MLB(string sport, double salary) : Athlete(sport, salary)
    {//inherits from base class overloaded constructor

    }
    virtual void pickLeaguePosition()
    {//test for abstraction function
        int positionChoice;//for user input of 1-5
        cout << "What position does the athlete play?" << endl;
        cout << "(1-5)" << endl;
        cout << "1. Pitcher" << endl;
        cout << "2. Catcher" << endl;
        cout << "3. Baseman" << endl;
        cout << "4. Shortstop" << endl;
        cout << "5. Outfielder" << endl;
        cin >> positionChoice;
        try
        {
            if (!(positionChoice >= 1 && positionChoice <= 5))
            {//error string to throw in case it is not between 1-5
                throw string("Invalid input! Setting default value to 1");
            }
            else if (positionChoice == 1)
            {
                position = "Pitcher";
            }
            else if (positionChoice == 2)
            {
                position = "Catcher";
            }
            else if (positionChoice == 3)
            {
                position = "Baseman";
            }
            else if (positionChoice == 4)
            {
                position = "Shortstop";
            }
            else if (positionChoice == 5)
            {
                position = "Outfielder";
            }
        }
        catch (string exceptionString)
        {//catches the string and makes it equal to the first position
            cout << exceptionString << endl;
```

```
53              position = "Pitcher"; //default position for the MLB class
54          }
55      }
56      virtual void displayLeagueSalaryData()
57      {//test for abstraction function
58          double leagueAvg = 4170000.00;//average salary for an MLB athlete
59          cout << "This Athlete's salary of $" << fixed << setprecision(2) << salary
                << " compares to ";
60          cout << fixed << setprecision(2) << ((salary / leagueAvg) * 100) << "% of
              the average ";//for a percentage out of 100
61          cout << league << " player's salary of $" << fixed << setprecision(2) <<
              leagueAvg << endl;
62      }//displays the variables and set to USD standard of cents; compares salary to
            league average in a percentage
63  };
64  #endif // !MLB_H
```

```
Which Sport does the athlete play ?
(1 - 3)
1 : NBA
2 : MLB
3 : NHL
2
What is the Athlete's Salary?
2800000
What position does the athlete play?
(1-5)
1. Pitcher
2. Catcher
3. Baseman
4. Shortstop
5. Outfielder
5
Athlete Data: MLB Outfielder
This Athlete's salary of $2800000.00 compares to 67.15% of the average MLB player's salary of $4170000.00
```

```
#ifndef NBA_H
#define NBA_H
#include "Athlete.h"

class NBA : public Athlete//to inherit from base class
{
public:
    NBA(string sport, double salary) : Athlete(sport, salary)
    {//inherits from base class overloaded constructor

    }
    virtual void pickLeaguePosition()
    {//test for abstraction function
        int positionChoice;//for user input of 1-5
        cout << "What position does the athlete play?" << endl;
        cout << "(1-5)" << endl;
        cout << "1. Point Guard" << endl;
        cout << "2. Shooting Guard" << endl;
        cout << "3. Small Forward" << endl;
        cout << "4. Power Forward" << endl;
        cout << "5. Center" << endl;
        cin >> positionChoice;
        try
        {
            if (!(positionChoice >= 1 && positionChoice <= 5))
            {//error string to throw in case it is not between 1-5
                throw string("Invalid input! Setting default value to 1");
            }
            else if (positionChoice == 1)
            {
                position = "Point Guard";
            }
            else if (positionChoice == 2)
            {
                position = "Shooting Guard";
            }
            else if (positionChoice == 3)
            {
                position = "Small Forward";
            }
            else if (positionChoice == 4)
            {
                position = "Power Forward";
            }
            else if (positionChoice == 5)
            {
                position = "Center";
            }
        }
        catch (string exceptionString)
        {//catches the string and makes it equal to the first position
            cout << exceptionString << endl;
```

```
53              position = "Point Guard";//default position for the NBA class
54          }
55      }
56      virtual void displayLeagueSalaryData()
57      {//test for abstraction function
58          double leagueAvg = 4580000.00;//average salary for an NBA athlete
59          cout << "This Athlete's salary of $" << fixed << setprecision(2) << salary
               << " compares to ";
60          cout << fixed << setprecision(2) << ((salary / leagueAvg) * 100) << "% of
              the average ";//for a percentage out of 100
61          cout << league << " player's salary of $" << fixed << setprecision(2) <<
              leagueAvg << endl;
62      }//displays the variables and set to USD standard of cents; compares salary to
           league average in a percentage
63  };
64  #endif // !NBA_H
```

```
Which Sport does the athlete play ?
(1 - 3)
1 : NBA
2 : MLB
3 : NHL
1
What is the Athlete's Salary?
5345000
What position does the athlete play?
(1-5)
1. Point Guard
2. Shooting Guard
3. Small Forward
4. Power Forward
5. Center
2
Athlete Data: NBA Shooting Guard
This Athlete's salary of $5345000.00 compares to 116.70% of the average NBA player's salary of $4580000.00
```