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Fundamentals of Programing II – CSIT 112\_04

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**Programing Project 4/9/2018**

**PP 9.3 -** Design and implement a set of classes that define various types of reading material: books, novels, magazines, technical journals, textbooks, and so on. Include data values that describe various attributes of the material, such as the number of pages and the names of the primary characters. Include methods that are named appropriately for each class and that print an appropriate message. Create a *main* driver class to instantiate and exercise several of the classes.

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

// ReadingMaterial.java Authors: Lewis/Loftus

//

// Solution to Programming Project 9.3

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**public** **class** ReadingMaterial

{

**protected** String title, isbn;

//-----------------------------------------------------------------

// Sets up this reading matter with the specified information.

//-----------------------------------------------------------------

**public** ReadingMaterial (String thisTitle, String isbnNum)

{

title = thisTitle;

isbn = isbnNum;

}

//-----------------------------------------------------------------

// Sets the title for this reading matter.

//-----------------------------------------------------------------

**public** **void** setTitle (String thisTitle)

{

title = thisTitle;

}

//-----------------------------------------------------------------

// Sets the isbn number for this reading matter.

//-----------------------------------------------------------------

**public** **void** setISBN (String isbnNum)

{

isbn = isbnNum;

}

//-----------------------------------------------------------------

// Returns the title of this reading matter.

//-----------------------------------------------------------------

**public** String getTitle()

{

**return** title;

}

//-----------------------------------------------------------------

// Returns the isbn number of this reading matter.

//-----------------------------------------------------------------

**public** String getISBN()

{

**return** isbn;

}

//-----------------------------------------------------------------

// Returns a description of this reading matter as a string.

//-----------------------------------------------------------------

**public** String toString()

{

**return** (title + "\t" + isbn);

}

//-----------------------------------------------------------------

// Prints a message appropriate for this reading matter.

//-----------------------------------------------------------------

**public** **void** content()

{

System.***out***.println ("Title: " + title);

System.***out***.println ("ISBN: " + isbn);

}

}

**public** **class** Book **extends** ReadingMaterial {

**private** **int** pages;

**private** String author, mainCharacter;

// Constructor initializes a book

**public** Book (String tittle, String isbn, String author, **int** pages) {

**super**(tittle, isbn);

**this**.author = author;

**this**.pages = pages;

}

// sets/changes the main character of the book

**public** **void** setMainCharacter (String character) {

mainCharacter = character;

}

// print some information about the book

**public** **void** getMainCharacter () {

System.***out***.println(mainCharacter + " is the main character of this book. \n");

}

**public** String toString() {

String result = **super**.toString();

result += "\nNumber of pages: " + pages;

**return** result;

}

}

**public** **class** Magazine **extends** ReadingMaterial {

**private** **int** pages, stories;

**private** String publisher;

// Constructor initializes a magazine

**public** Magazine (String tittle, String isbn, **int** pages, **int** stories) {

**super**(tittle, isbn);

**this**.pages = pages;

**this**.stories = stories;

}

// sets/changes the number of stories in the magazine

**public** **void** setStoriesCount (**int** storiesNum) {

stories = storiesNum;

}

// print some information about the magazine

**public** **void** getPublisher () {

System.***out***.println(publisher + " is the publisher of this Magazine.\n");

}

**public** String toString() {

String result = **super**.toString();

result += "\nNumber of pages: " + pages + "\tNumber of stories: " + stories;

**return** result;

}

}

**public** **class** Novel **extends** ReadingMaterial {

**private** **int** pages;

**private** String author, mainCharacter;

// Constructor initializes a novel

**public** Novel (String tittle, String isbn, String author, **int** pages) {

**super**(tittle, isbn);

**this**.author = author;

**this**.pages = pages;

}

// sets/changes the main character of the novel

**public** **void** setMainCharacter (String character) {

mainCharacter = character;

}

// print some information about the novel

**public** **void** getMainCharacter () {

System.***out***.println(mainCharacter + " is the main character of this novel. \n");

}

**public** String toString() {

String result = **super**.toString();

result += "\nNumber of pages: " + pages + "\tAuthor: " + author;

**return** result;

}

}

**public** **class** TechJournal **extends** ReadingMaterial {

**private** **int** pages, publicationNum;

**private** String mainWriter;

// Constructor initializes a technical journal

**public** TechJournal(String tittle, String isbn, **int** pages, **int** publicationNum) {

**super**(tittle, isbn);

**this**.pages = pages;

**this**.publicationNum = publicationNum;

}

// sets/changes the main writer of the technical journal

**public** **void** setMainWritter(String writer) {

mainWriter = writer;

}

// print some information about the technical journal

**public** **void** getMainWritter () {

System.***out***.println(mainWriter + " is the main writer of this Technical Journal.\n");

}

**public** String toString() {

String result = **super**.toString();

result += "\nNumber of pages: " + pages + "\tNumber of publications: " + publicationNum;

**return** result;

}

}

**public** **class** Textbook **extends** ReadingMaterial {

**private** **int** pages;

**private** String subject;

// Constructor initializes a textbook

**public** Textbook(String tittle, String isbn, **int** pages) {

**super**(tittle, isbn);

**this**.pages = pages;

}

// sets/changes the main subject of the textbook

**public** **void** setSubject (String subject) {

**this**.subject = subject;

}

// print some information about the textbook

**public** **void** getSubject () {

System.***out***.println(subject + " is the main subject of this book. \n");

}

**public** String toString() {

String result = **super**.toString();

result += "\nNumber of pages: " + pages;

**return** result;

}

}

**public** **class** ReadingMaterialDriver {

**public** **static** **void** main(String args[]) {

// Initializes some reading materials

Book book1 = **new** Book("The wonders of the world", "978-1-933624-34-1", "David", 600);

Magazine magazine1 = **new** Magazine("Scandal", "978-1-933624-76-1", 35, 16);

Novel novel1 = **new** Novel("The adventures of Tim", "978-1-60309-385-9", "Mary Collins", 500);

TechJournal techJournal1 = **new** TechJournal("Science", "978-1-891830-51-8", 54, 12);

Textbook textbook1 = **new** Textbook("Introduction to Linear Algebra", "978-1-60309-052-0", 200);

// Prints out information about the reading materials

System.***out***.println(book1);

book1.setMainCharacter("Joseph");

book1.getMainCharacter();

System.***out***.println(magazine1);

magazine1.setStoriesCount(15);

magazine1.getPublisher();

System.***out***.println(novel1);

novel1.setMainCharacter("Tim");

novel1.getMainCharacter();

System.***out***.println(techJournal1);

techJournal1.setMainWritter("J. Phillips");

techJournal1.getMainWritter();

System.***out***.println(textbook1);

textbook1.setSubject("Linear Algebra");

textbook1.getSubject();

}

}

**PP 9.4 -** Design and implement a set of classes that keeps track of various sports statistics. Have each low-level class represent a specific sport. Tailor the services of the classes to the sport in question, and move common attributes to the higher-level classes as appropriate. Create a *main* driver class to instantiate and exercise several of the classes.

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

// PlayerStats.java Author: Lewis/Loftus

//

// Solution to Programming Project 9.4

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**public** **abstract** **class** PlayerStats

{

**protected** String player, team;

**protected** **int** score;

//-----------------------------------------------------------------

// Sets up this stat object with the specified info.

//-----------------------------------------------------------------

**public** PlayerStats (String playerName, String teamName)

{

player = playerName;

team = teamName;

score = 0;

}

//-----------------------------------------------------------------

// Returns the score.

//-----------------------------------------------------------------

**public** **int** getScore()

{

**return** score;

}

//-----------------------------------------------------------------

// Updates the score as appropriate depending on the sport.

//-----------------------------------------------------------------

**public** **abstract** **void** score();

//-----------------------------------------------------------------

// Returns a description of this stats object as a string.

//-----------------------------------------------------------------

**public** String toString()

{

String result = "Player: " + player;

result += "\nTeam: " + team;

result += "\nScore: " + score;

**return** result;

}

}

**public** **class** Baseball **extends** PlayerStats {

**private** **int** homerun;

// Constructor initializes a Baseball team player and calculates its score

**public** Baseball(String player, String team, **int** homerun) {

**super**(player, team);

**this**.homerun = homerun;

score();

}

// Abstract method that calculates the score of a baseball game

**public** **void** score() {

score = homerun;

}

// Method to change the score of a baseball game

**public** **void** changeScore (**int** homerun) {

**this**.homerun = homerun;

score();

}

**public** String toString() {

String result = **super**.toString();

result += "\nNumber of homeruns: " + homerun;

**return** result;

}

}

**public** **class** Football **extends** PlayerStats {

**private** **int** goals;

**int** touchdown, fieldGoal;

// Constructor initializes a Football team player and calculates its score

**public** Football (String player, String team, **int** touchdown, **int** fieldGoal) {

**super**(player, team);

**this**.touchdown = touchdown;

**this**.fieldGoal = fieldGoal;

score();

}

// Abstract method that calculates the score of a football game

**public** **void** score() {

score = touchdown\*6 + fieldGoal\*1;

}

// Method to change the score of a football game

**public** **void** changeScore (**int** touchdown, **int** fieldgoal) {

**this**.touchdown = touchdown;

**this**.fieldGoal = fieldgoal;

score();

}

**public** String toString() {

String result = **super**.toString();

result += "\nNumber of touchdowns: " + touchdown + "\nNumber of field goals: " + fieldGoal;

**return** result;

}

}

**public** **class** PlayerStatsDriver {

**public** **static** **void** main(String args[]) {

// Initializes team players

Baseball team1 = **new** Baseball("Paul", "Angels", 4);

Football team2 = **new** Football("Ravens", "Devils", 7, 6);

// Changes the score

team1.changeScore(5);

team2.changeScore(4, 3);

// Prints out information about the teams

System.***out***.println(team1);

System.***out***.println();

System.***out***.println(team2);

}

}

**PP 9.5 -** Design and implement a set of classes that keeps track of demographic information about a set of people, such as age, nationality, occupation, income, and so on. Design each class to focus on a particular aspect of data collection. Create a main driver class to instantiate and exercise several of the classes.

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

// Person.java Author: Lewis/Loftus

//

// Solution to Programming Project 9.5

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**public** **class** Person

{

**private** **int** age;

**private** String location;

//------------------------------------------------------------------

// Creates a person with the specified age and location.

//------------------------------------------------------------------

**public** Person(**int** personAge, String personLocation)

{

age = personAge;

location = personLocation;

}

//------------------------------------------------------------------

// Returns a string summary of this person.

//------------------------------------------------------------------

**public** String toString()

{

**return** "Age: " + age + "\nLocation: " + location;

}

}

**public** **class** ForeignStudent **extends** Person {

**private** String occupation, nationality, firstName, secondName;

**private** **int** income;

// Constructor initializes a foreign student

**public** ForeignStudent (String name1, String name2, **int** pAge, String pLocation) {

**super**(pAge, pLocation);

firstName = name1;

secondName = name2;

occupation = "Student";

}

// Sets the foreign student's nationality

**public** **void** setNationality(String nationality) {

**this**.nationality = nationality;

}

// returns the foreign student's nationality

**public** String getNationality() {

**return** "" + nationality;

}

// Sets the foreign student's income

**public** **void** setIncome(**int** inc) {

income = inc;

}

// Sets the foreign student's income

**public** **int** getIncome() {

**return** income;

}

// prints some information about the foreign student

**public** String toString() {

String result = "Name: " + firstName + " " + secondName +"\n";

result += **super**.toString();

result += "\nOccupation: " + occupation + "\nIncome: $" + income + " a year";

result += "\nNationality: " + nationality;

**return** result;

}

}

**public** **class** Student **extends** Person {

**private** String occupation, nationality, firstName, secondName;

**private** **int** income;

// Constructor initializes an American student

**public** Student (String name1, String name2, **int** pAge, String pLocation) {

**super**(pAge, pLocation);

firstName = name1;

secondName = name2;

occupation = "Student";

nationality = "American";

}

// Sets the student's income

**public** **void** setIncome(**int** inc) {

income = inc;

}

// Returns the student's income

**public** **int** getIncome() {

**return** income;

}

// Prints some information about the foreign student

**public** String toString() {

String result = "Name: " + firstName + " " + secondName +"\n";

result += **super**.toString();

result += "\nOccupation: " + occupation + "\nIncome: $" + income + " a year";

result += "\nNationality: " + nationality;

**return** result;

}

}

**public** **class** Worker **extends** Person {

**private** String occupation, nationality, firstName, secondName;

**private** **int** income;

// Constructor initializes a worker

**public** Worker (String name1, String name2, **int** pAge, String pLocation) {

**super**(pAge, pLocation);

firstName = name1;

secondName = name2;

}

// Sets the worker's nationality

**public** **void** setNationality(String nationality) {

**this**.nationality = nationality;

}

// Returns the worker's nationality

**public** String getNationality() {

**return** "" + nationality;

}

// Sets the worker's occupation

**public** **void** setOccupation(String occupation) {

**this**.occupation = occupation;

}

// Returns the worker's occupation

**public** String getOccupation() {

**return** "" + occupation;

}

// Sets the worker's income

**public** **void** setIncome(**int** inc) {

income = inc;

}

// Returns the worker's income

**public** **int** getIncome() {

**return** income;

}

// Prints some information about the foreign student

**public** String toString() {

String result = "Name: " + firstName + " " + secondName +"\n";

result += **super**.toString();

result += "\nOccupation: " + occupation + "\nIncome: $" + income + " a year";

result += "\nNationality: " + nationality;

**return** result;

}

}

**public** **class** PersonDriver {

**public** **static** **void** main(String args[]) {

// Initializes some people

Worker worker1 = **new** Worker("John", "Smith", 25, "Colorado");

Student stud1 = **new** Student("Ana", "Banana", 18, "New York");

ForeignStudent forstud1 = **new** ForeignStudent("Juan", "Pablo", 23, "Mexico");

// Sets some values of the missing variables value

// Prints some information about the people

worker1.setIncome(81000);

worker1.setNationality("Peruvian");

worker1.setOccupation("Accountant");

System.***out***.println(worker1);

System.***out***.println();

stud1.setIncome(20000);

System.***out***.println(stud1);

System.***out***.println();

forstud1.setIncome(40000);

forstud1.setNationality("Mexican");

System.***out***.println(forstud1);

}

}