

Montgomery College
CMSC 203
Assignment 4 Design

Class: CMSC203 CRN 32689

Program: Assignment 4 Design

Instructor: Dr.Grinberg

Summary of Description: (Give a brief description for a Program)

Due Date: <03/25/2024>

Integrity Pledge: I pledge that I have completed the programming assignment independently.

I have not copied the code from a student or any source.

Student: Sousanna Chugunova

Part 1: Create UML diagrams for all the classes in this assignment.

Refer to the [UML Tutorial](#) on how to create UML diagrams.

Notes: To create UML Diagram you can use a simple free tool UMLSculptor
<https://sourceforge.net/projects/umlsculptor/>

See attached examples

Plot
-x: int -y: int -width: int -depth: int
+Plot (x:int, y: int, width: int, depth: int) +getX(): int +getY(): int +getWidth(): int +getDepth(): int +overlaps(Plot): boolean +encompasses(Plot):bool +toString(): String

Property
-propertyName: String -city: String -rentalAmount: double -owner: String -plot: Plot
+Property(property name:String, city: String, rentalAmount: double, owner:String, plot:Plot) +getpropertyName(): String +getCity(): String +getrentalAmount(): double +getOwner(): String +getPlot(): Plot +toString(): String

ManagementCompany
-companyname: String -taxId: String -managmentfeePercentage: double -properties: Property[] -plot: Plot -numberOfproperties: int
+MAX_PROPERTY: int +MGMT_WIDTH: int +MGMT_DEPTH: int
+ManagementCompany(companyName: String,taxId: string, managmentFeePercentage: double) +getCompanyName(): String +setCompanyName(companyName: String) +getTaxId(): String +setTaxId(taxId: String) +getManagmentFeePercentage():double +setManagmentFeePerctage(fee: double) +addProperty(property: Property): int +getTotalRent(): double +getHighestRentProperty(): Property +removeLastProperty(): void +isPropertiesFull(): boolean +getPropertiesCount():int +isManagementFeeValid(): boolean +toString(): String

MainClass
main (String[] args):

Part 2: Pseudo Code for the primary methods specified in ManagementCompany.java, and Plot.java in a Word document. Do not just list what gets read in a printed out, but explain the algorithm being used.

Refer to the [Pseudocode Guideline](#) on how to write Pseudocode.

ManagementCompany	Plot
<p>Class: ManagementCompany</p> <p>// Attributes name taxId mgmFeePer MAX_PROPERTY = 5 MGMT_WIDTH = 10 MGMT_DEPTH = 10 properties[MAX_PROPERTY] plot numberOfProperties</p> <p>// Constructor with parameters Constructor ManagementCompany(name, taxId, mgmFeePer): set name, taxId, and mgmFeePer to given values initialize plot with coordinates (0, 0) and dimensions (MGMT_WIDTH, MGMT_DEPTH) initialize properties array with size MAX_PROPERTY set numberOfProperties to 0</p> <p>// Getter/Setter methods for name, taxId, mgmFeePer</p> <p>// Method addProperty Method addProperty(property): if properties array is full: return -1 if property is null: return -2 if plot does not encompass property's plot: return -3 for each existing property in properties array: if property's plot overlaps with existing property's plot: return -4</p> <p> add property to properties array increment numberOfProperties return index of the added property</p> <p>// Method getTotalRent Method getTotalRent(): totalRent = 0 for each property in properties array: add property's rent amount to totalRent return totalRent</p>	<p>// Class: Plot</p> <p>// Attributes x, y, width, depth</p> <p>// Constructor with parameters function Plot(x, y, width, depth): set x to given x set y to given y set width to given width set depth to given depth</p> <p>// Default constructor function Plot(): set x to 0 set y to 0 set width to 0 set depth to 0</p> <p>// Getter/Setter methods function getX(): return x</p> <p>function setX(newX): set x to newX</p> <p>// Similarly, define getY(), setY(), getWidth(), setWidth(), getDepth(), setDepth() methods</p> <p>// Method named overlaps function overlaps(otherPlot): if (otherPlot.x is between x and x + width) and (otherPlot.y is between y and y + depth): return true else if (x is between otherPlot.x and otherPlot.x + otherPlot.width) and (y is between otherPlot.y and otherPlot.y + otherPlot.depth): return true return false</p> <p>// Method named encompasses function encompasses(otherPlot):</p>

<pre> // Method getHighestRentProperty Method getHighestRentProperty(): highestRentProperty = properties[0] for each property in properties array: if property's rent amount is greater than highestRentProperty's rent amount: set highestRentProperty to property return highestRentProperty // Method removeLastProperty Method removeLastProperty(): if numberOfProperties is 0: return remove the last property from properties array decrement numberOfProperties // Method isPropertiesFull Method isPropertiesFull(): return numberOfProperties is equal to MAX_PROPERTY // Method getPropertiesCount Method getPropertiesCount(): return numberOfProperties // Method isMangementFeeValid Method isMangementFeeValid(): return mgmFeePer is between 0 and 100 // Method toString Method toString(): result = "List of the properties for " + name + ", taxID: " + taxId + "\n" result += "_____ \n" for each property in properties array: result += property.toString() + "\n" result += "_____ \n" result += "total management Fee: " + calculateTotalManagementFee() return result </pre>	<pre> if (otherPlot.x >= x and otherPlot.x + otherPlot.width <= x + width) and (otherPlot.y >= y and otherPlot.y + otherPlot.depth <= y + depth): return true return false // toString method function toString(): return x + "," + y + "," + width + "," + depth </pre>
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