**//Student Name #1:Kaiwen Song Student Number #1:300028982**

**//Student Name #2:Zihan Xiao Student Number #2:300048507**

**1.** **The company Java Financial Solutions is developing a new software system for tracking professional expenses. You are part of the software development team responsible for the hierarchy of classes to represent expenses.**

**A.**

public abstract class Expense{

private String description;

public Expense(String description){

this.description=description;

}

public String getDescription(){

return description;

}

public abstract double getAmount();

}

**B.**

public abstract class Transportation extends Expense {

private String destination;

public Transportation(String description,String destination){

super(description);

this.destination=destination;

}

public String getDestination(){

return destination;

}

}

**C.**

public class PrivateCar extends Transportation{

private int distance;

public static double RATE=0.427;

public PrivateCar(String description, String destination,int distance){

super(description,destination);

this.distance=distance;

}

public int getDistance(){

return distance;

}

//return the expense of privatecar

public double getAmount(){

return distance\*RATE;

}

}

**D.**

public class Airfare extends Transportation{

private double amount;

public Airfare(String description,String destination,double amount){

super(description,destination);

this.amount=amount;

}

//get the amount expense of Airfare

public double getAmount(){

return amount;

}

}

**E.**

public abstract class Meal extends Expense{

private int numberOfMeals;

public Meal(String description, int numberOfMeals){

super(description);

this.numberOfMeals=numberOfMeals;

}

public int getNumberOfMeals(){

return numberOfMeals;

}

//return the expense of meal

public double getAmount(){

return numberOfMeals\*getALLOWANCE();

}

public abstract double getALLOWANCE();

}

**F.**

public class Breakfast extends Meal{

public static double ALLOWANCE=11.55;//set the allowace value

public Breakfast(String description,int numberOfMeals){

super(description,numberOfMeals);

}

public double getALLOWANCE(){

return ALLOWANCE;

}

}

**G.**

public class ExpenseTracker{

private Expense [] expenses;

private int size;

public ExpenseTracker(int capacity){

expenses= new Expense [capacity];

size=0;

}

public boolean add(Expense e){

expenses[size++]=e;

return true;

}

// returns the total amount for all the expenses that are currently stored in the ExpenseTracker

public double getTotal(){

double total=0;

for(int i=0;i<size;i++){

total=total+expenses[i].getAmount();

}

return total;

}

}

**2.**

1. What visibility must variables declared in pack1.Class1 have in order to be visible in pack1.Class2?

The public,protected and default variables of pack1.Class1 are visible in pack1.Class2

1. What visibility must variables declared in pack1.Class1 have in order to be visible in pack2.Class3?

The public and protected variables of pack1.Class1 are visible in pack2.Class3.

1. What visibility must variables declared in pack1.Class1 have in order to be visible in pack2.Class4?

Only the public variables of pack1.Class1 are visible in pack2.Class4.