**Main Method();**

**Question 1:**

***Employee Class();***

*abstract* *class* Employee {

*protected* *String* firstName;

*protected* *String* lastName;

*protected* *String* SSN;

*// Default Constructor*

*public* Employee(){

    }

*// Argumented Constructor*

*public* Employee(*String* *firstName\_prime*, *String* *lastName\_prime*,*String* *SSN\_prime*){

*this*.firstName = firstName\_prime;

*this*.lastName = lastName\_prime;

*this*.SSN = SSN\_prime;

    }

*// Setters*

*public* *void* setFirstName(*String* *firstName\_prime*){

*this*.firstName = firstName\_prime;

    }

*public* *void* setLastName(*String* *lastName\_prime*){

*this*.lastName = lastName\_prime;

    }

*public* *void* setSSN(*String* *SSN\_prime*){

*this*.SSN = SSN\_prime;

    }

*// Getters*

*public* *String* getFirstName(){

        return firstName;

    }

*public* *String* getLastName(){

        return lastName;

    }

*public* *String* getSSN(){

        return SSN;

    }

*// Abstract Method Declaration*

*public* *abstract* *int* earnings();

}

***HourlyEmployee Class();***

*class* HourlyEmployee *extends* *Employee*{

*private* *int* hours;

*private* *int* wagePerHour;

*// Default Constructor*

*public* HourlyEmployee(){

*super*();

    }

*// Argumented Constructor*

*public* HourlyEmployee(*String* *firstName\_prime*, *String* *lastName\_prime*,*String* *SSN\_prime*, *int* *hours\_prime*, *int* *wagePerHour\_prime*){

*super*(firstName\_prime, lastName\_prime,SSN\_prime);

*this*.hours = hours\_prime;

*this*.wagePerHour = wagePerHour\_prime;

    }

*// Setters*

*public* *void* setHours(*int* *hours\_prime*){

*this*.hours = hours\_prime;

    }

*public* *void* setWagePerHour(*int* *wagePerHour\_prime*){

*this*.wagePerHour = wagePerHour\_prime;

    }

*// Getters*

*public* *int* getHours(){

        return hours;

    }

*public* *int* getWagePerHour(){

        return wagePerHour;

    }

*public* *int* earnings(){

        return hours \* wagePerHour;

    }

}

***WeeklyEmployee Class();***

*class* weeklyEmployee *extends* *Employee*{

*private* *int* weeklySalary;

*// Default Constructor*

*public* weeklyEmployee(){

*super*();

    }

*// Argumented Constructor*

*public* weeklyEmployee(*String* *firstName\_prime*, *String* *lastName\_prime*,*String* *SSN\_prime*, *int* *weeklySalary\_prime*){

*super*(firstName\_prime, lastName\_prime, SSN\_prime);

*this*.weeklySalary = weeklySalary\_prime;

    }

*// Setters*

*public* *void* setWeeklySalary(*int* *weeklySalary\_prime*){

*this*.weeklySalary = weeklySalary\_prime;

    }

*// Getters*

*public* *int* getWeeklySalary(){

        return weeklySalary;

    }

*public* *int* earnings(){

        return weeklySalary;

    }

}

***CommisionEmployee Class();***

*class* CommisionEmployee *extends* *Employee*{

*protected* *int* sales;

*protected* *int* CommisionRate;

*// Default Constructor*

*public* CommisionEmployee(){

*super*();

    }

*// Argumented Constructor*

*public* CommisionEmployee(*String* *firstName\_prime*, *String* *lastName\_prime*,*String* *SSN\_prime*, *int* *sales\_prime*, *int* *CommisionRate\_prime*){

*super*(firstName\_prime, lastName\_prime,SSN\_prime);

*this*.sales = sales\_prime;

*this*.CommisionRate = CommisionRate\_prime;

    }

*// Setters*

*public* *void* setSales(*int* *sales\_prime*){

*this*.sales = sales\_prime;

    }

*public* *void* setCommisionRate(*int* *CommisionRate\_prime*){

*this*.CommisionRate = CommisionRate\_prime;

    }

*// Getters*

*public* *int* getSales(){

        return sales;

    }

*public* *int* getCommisionRate(){

        return CommisionRate;

    }

*public* *int* earnings(){

        return sales \* CommisionRate;

    }

}

***BasePlusCommisionEmployee Class();***

*class* BasePlusCommisionEmployee *extends* *CommisionEmployee*{

*private* *int* basicSalary;

*// Default Constructor*

*public* BasePlusCommisionEmployee(){

*super*();

    }

*// Argumented Constructor*

*public* BasePlusCommisionEmployee(*String* *firstName\_prime*, *String* *lastName\_prime*,*String* *SSN\_prime*, *int* *sales\_prime*, *int* *CommisionRate\_prime*, *int* *basicSalary\_prime*){

*super*(firstName\_prime, lastName\_prime, SSN\_prime, sales\_prime, CommisionRate\_prime);

*this*.basicSalary = basicSalary\_prime;

    }

*// Setters*

*public* *void* setBasicSalary(*int* *basicSalary\_prime*){

*this*.basicSalary = basicSalary\_prime;

    }

*// Getters*

*public* *int* getBasicSalary(){

        return basicSalary;

    }

*public* *int* earnings(){

        return *super*.earnings() + basicSalary;

    }

}

**Question 2:**

***PackageDelivery Class();***

*public* *class* PackageDelivery {

*protected* *String* senderName, senderAddress, recipientName, recipientAddess;

*protected* *double* weight, costPerOunce;

*//Defaiut Constructor*

*public* PackageDelivery(){

    }

*//Argumented Constructor*

*public* PackageDelivery(*String* *senderName\_prime*, *String* *senderAddress\_prime*, *String* *recipientName\_prime*, *String* *recipientAddress\_prime*, *double* *weight\_prime*, *double* *costPerOunce\_prime*){

*this*.senderName = senderName\_prime;

*this*.senderAddress = senderAddress\_prime;

*this*.recipientName = recipientName\_prime;

*this*.recipientAddess = recipientAddress\_prime;

        if(weight\_prime > 0){

*this*.weight = weight\_prime;

        }

        else{

            System.out.println("Enter the right amount of weight!");

        }

        if(costPerOunce\_prime > 0){

*this*.costPerOunce = costPerOunce\_prime;

        }

        else{

            System.out.println("Enter the right cost!");

        }

    }

*// Setters*

*public* *void* setSenderName(*String* *senderName\_prime*){

*this*.senderName = senderName\_prime;

    }

*public* *void* setSenderAddress(*String* *senderAddress\_prime*){

*this*.senderAddress = senderAddress\_prime;

    }

*public* *void* setRecipientName(*String* *recipientName\_prime*){

*this*.recipientName = recipientName\_prime;

    }

*public* *void* setRecipientAddress(*String* *recipientAddress\_prime*){

*this*.recipientAddess = recipientAddress\_prime;

    }

*public* *void* setWeight(*double* *weight\_prime*){

        if(weight\_prime > 0){

*this*.weight = weight\_prime;

        }

        else{

            System.out.println("Enter the right amount of weight!");

        }

    }

*public* *void* setCostPerOunce(*double* *costPerOunce\_prime*){

        if(costPerOunce\_prime > 0){

*this*.costPerOunce = costPerOunce\_prime;

        }

        else{

            System.out.println("Enter the right cost!");

        }

    }

*//Getters*

*public* *String* getSenderName(){

        return senderName;

    }

*public* *String* getSenderAddress(){

        return senderAddress;

    }

*public* *String* getRecipientName(){

        return recipientName;

    }

*public* *String* getRecipientAddress(){

        return recipientAddess;

    }

*public* *double* getWeight(){

        return weight;

    }

*public* *double* getCostPerOnce(){

        return costPerOunce;

    }

*// Member function*

*public* *double* calculateCost(){

        return weight \* costPerOunce;

    }

}

***TwoDayPackage Class();***

*class* TwoDayPackage *extends* *PackageDelivery*{

*private* *double* flatFee;

*//Defaiut Constructor*

*public* TwoDayPackage(){

*super*();

    }

*//Argumented Constructor*

*public* TwoDayPackage(*String* *senderName\_prime*, *String* *senderAddress\_prime*, *String* *recipientName\_prime*, *String* *recipientAddress\_prime*, *double* *weight\_prime*, *double* *costPerOunce\_prime*, *double* *flatFee\_prime*){

*super*(senderName\_prime, senderAddress\_prime, recipientName\_prime, recipientAddress\_prime, weight\_prime, costPerOunce\_prime);

*this*.flatFee = flatFee\_prime;

    }

*// Setters*

*public* *void* setFlatFee(*double* *flatFee\_prime*){

*this*.flatFee = flatFee\_prime;

    }

*// Getters*

*public* *double* getFlatFee(){

        return flatFee;

    }

*// Overriding function*

*public* *double* calculateCost(){

        return *super*.calculateCost() + flatFee;

    }

}

***OvernightPackage Class();***

*class* OvernightPackage *extends* *PackageDelivery*{

*private* *double* additionalFee;

*//Defaiut Constructor*

*public* OvernightPackage(){

*super*();

    }

*//Argumented Constructor*

*public* OvernightPackage(*String* *senderName\_prime*, *String* *senderAddress\_prime*, *String* *recipientName\_prime*, *String* *recipientAddress\_prime*, *double* *weight\_prime*, *double* *costPerOunce\_prime*, *double* *additionalFee\_prime*){

*super*(senderName\_prime, senderAddress\_prime, recipientName\_prime, recipientAddress\_prime, weight\_prime, costPerOunce\_prime);

*this*.additionalFee = additionalFee\_prime;

    }

*// Setters*

*public* *void* setAdditionalFee(*double* *additionalFee\_prime*){

*this*.additionalFee = additionalFee\_prime;

    }

*// Getters*

*public* *double* getAdditionalFee(){

        return additionalFee;

    }

*// Overriding function*

*public* *double* calculateCost(){

        return *super*.calculateCost() + additionalFee;

    }

}

**Question 3:**

***Movie Class();***

*public* *abstract* *class* Movie {

*protected* *int* idNumber, numberOfDays;

*protected* *String* title;

*// Default constructor*

*public* Movie(){

    }

*// Argumented Constructor*

*public* Movie(*int* *idNumber\_prime*, *int* *numberOfDays\_prime*, *String* *title\_prime*){

*this*.idNumber = idNumber\_prime;

*this*.numberOfDays = numberOfDays\_prime;

*this*.title = title\_prime;

    }

*// Setters*

*public* *void* setIdNumber(*int* *idNumber\_prime*){

*this*.idNumber = idNumber\_prime;

    }

*public* *void* setNumberOfDays(*int* *numberOfDays\_prime*){

*this*.idNumber = numberOfDays\_prime;

    }

*public* *void* setTitle(*String* *title\_prime*){

*this*.title = title\_prime;

    }

*// Getters*

*public* *int* getIdNumber(){

        return idNumber;

    }

*public* *int* getNumberOfDays(){

        return numberOfDays;

    }

*public* *String* getTitle(){

        return title;

    }

*// Equals Method*

*public* *boolean* equals(*Movie* *m\_prime*){

*boolean* check = true;

        if ((*this*.idNumber != m\_prime.idNumber) || (*this*.numberOfDays != m\_prime.numberOfDays) || (*this*.title != m\_prime.title)) {

            check = false;

        }

        return check;

    }

*public* *abstract* *double* calcLateFees(*int* *lateDays*);

}

***Action Class();***

*class* Action *extends* *Movie*{

*// constructor*

*public* Action(){

    }

*// Overridden Method*

*public* *double* calcLateFees(*int* *lateDays*){

        return 3 \* lateDays;

    }

}

***Comedy Class();***

*class* Comedy *extends* *Movie*{

*// constructor*

*public* Comedy(){

    }

*// Overridden Method*

*public* *double* calcLateFees(*int* *lateDays*){

        return 2.5 \* lateDays;

    }

}

***Drama Class();***

*class* Drama *extends* *Movie*{

*// constructor*

*public* Drama(){

    }

*// Overridden Method*

*public* *double* calcLateFees(*int* *lateDays*){

        return 2 \* lateDays;

    }

}

**Question 4:**

***Person Class();***

*public* *abstract* *class* Person {

*protected* *String* name;

*// Default Constructor*

*public* Person(){

    }

*// Argumented Constructor*

*public* Person(*String* *name\_prime*){

*this*.name = name\_prime;

    }

*// Setters*

*public* *void* setName(*String* *name\_prime*){

*this*.name = name\_prime;

    }

*// Getters*

*public* *String* getName(){

        return name;

    }

*// Abstract Method*

*public* *abstract* *boolean* isOutstanding();

}

***Student Class();***

*class* Student *extends* *Person*{

*private* *double* CGPA;

*// Default Constructor*

*public* Student(){

*super*();

    }

*// Argumented Constructor*

*public* Student(*String* *name\_prime*, *double* *CGPA\_Prime*){

*super*(name\_prime);

*this*.CGPA = CGPA\_Prime;

    }

*// Setters*

*public* *void* setCGPA(*double* *CGPA\_Prime*){

*this*.CGPA = CGPA\_Prime;

    }

*// Getters*

*public* *double* getCGPA(){

        return CGPA;

    }

*// Obverriding Abstract Method*

*public* *boolean* isOutstanding(){

*boolean* check = true;

        if (*CGPA* < 3.5) {

            check = false;

        }

        return check;

    }

}

***Professor Class();***

*class* Professor *extends* *Person*{

*private* *int* numberOfPublications;

*// Default Constructor*

*public* Professor(){

*super*();

    }

*// Argumented Constructor*

*public* Professor(*String* *name\_prime*, *int* *numberOfPublications\_prime*){

*super*(name\_prime);

*this*.numberOfPublications = numberOfPublications\_prime;

    }

*// Setters*

*public* *void* setNumberOfPublications(*int* *numberOfPublications\_prime*){

*this*.numberOfPublications = numberOfPublications\_prime;

    }

*// Getters*

*public* *int* getNumberOfPublications(){

        return numberOfPublications;

    }

*// Obverriding Abstract Method*

*public* *boolean* isOutstanding(){

*boolean* check = true;

        if (numberOfPublications < 50) {

            check = false;

        }

        return check;

    }

}

**Question 5:**

***Convert Class();***

*abstract* *class* Convert {

*protected* *double* val1, val2;

*// Default Constructor*

*public* Convert(){

    }

*// Argumented Constructor*

*public* Convert(*double* *val1\_prime*){

*this*.val1 = val1\_prime;

    }

*// Setters*

*public* *void* setVal1(*double* *val1\_prime*){

*this*.val1 = val1\_prime;

    }

*public* *void* setVal2(*double* *val2\_prime*){

*this*.val2 = val2\_prime;

    }

*// Getters*

*public* *double* getVal1(){

        return val1;

    }

*public* *double* getVal2(){

        return val2;

    }

*public* *abstract* *double* compute();

}

***L-To-G Class();***

*class* l\_to\_g *extends* *Convert*{

*// Default Constructor*

*public* l\_to\_g(){

*super*();

    }

*// Argumented Constructor*

*public* l\_to\_g(*double* *val1\_prime*){

*super*(val1\_prime);

    }

*// Overriding Abstract Method*

*public* *double* compute() {

        val2 = val1 \* 0.264172;

        return val2;

    }

}

***f-To-C Class();***

*class* f\_to\_c *extends* *Convert*{

*// Default Constructor*

*public* f\_to\_c(){

*super*();

    }

*// Argumented Constructor*

*public* f\_to\_c(*double* *val1\_prime*){

*super*(val1\_prime);

    }

*// Overriding Abstract Method*

*public* *double* compute() {

        val2 = ((val1 - 32) \* 5 ) / 9;

        return val2;

    }

}

***f-To-M Class();***

*class* f\_to\_m *extends* *Convert*{

*// Default Constructor*

*public* f\_to\_m(){

*super*();

    }

*// Argumented Constructor*

*public* f\_to\_m(*double* *val1\_prime*){

*super*(val1\_prime);

    }

*// Overriding Abstract Method*

*public* *double* compute() {

        val2 = val1 \* 0.3048;

        return val2;

    }

}