1.Sarah got confused to creating the constructor. Write a Java application to help Sarah to do this.

|  |  |  |  |
| --- | --- | --- | --- |
| **Type(Class)** | **Attributes** | **Methods** | **Responsibilities** |
| **Student** | int studentId  String studentName  String studentAddress  String collegeName | Include the getters and setters method for all the attributes. |  |
| **Student** |  | Include a public parametrized constructor of four arguments in the following order - studentId, studentName, studentAddress, and collegeName to initialize the values for the Student object | If student belongs to other college, give input as **'no/NO'** and get college name from the user and create student object with 4-argument constructor to initialize all the values. |
| **Student** |  | Include a public parametrized constructor of three arguments in the following order - studentId, studentName, studentAddress, and collegeName should be **"NIT"** to initialize the values for the Student object | If student belongs to NIT, give input as **'yes/YES'** and skip input for the attribute collegeName and create student object with 3-argument constructor to initilze the values for studentId, studentName and studentAddress and  collegeName as **"NIT"**. |

**Note:**The class and methods should be declared as public and all the attributes should be declared as private.

In the **UserInterface** class, write the main method to test the application.

Assume most of the students are from "NIT" college. So user has to give input whether the student is from NIT or not.

Instead of Yes / No, if user enters different input then display 'Wrong Input' and get the input again.

**Note:**

-         In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.

-         Ensure to follow the object-oriented specifications provided in the question description.

-         Ensure to provide the names for classes, attributes, and methods as specified in the question description.

-         Adhere to the code template, if provided.

-         Please do not use **System.exit(0)** to terminate the program

**Sample Input 1:**

Enter Student's Id:

**12**

Enter Student's Name:

**John**

Enter Student's address:

**Chennai**

Whether the student is from NIT(Yes/No):

**NO**

Enter the college name:

**SVS**

**Sample Output 1:**

Student id:12

Student name:John

Address:Chennai

College name:SVS

**Sample Input 2:**

Enter Student's Id:

**43**

Enter Student's Name:

**Tom**

Enter Student's address:

**Coimbatore**

Whether the student is from NIT(Yes/No):

**y**

Wrong Input

Whether the student is from NIT(Yes/No):

**yes**

**Sample Output 2:**

Student id:43

Student name:Tom

Address:Coimbatore

College name:NIT

2.

Sarah got confused to calculate volume of cylinder and cuboid. Write a Java application to help Sarah to do this.

**Requirement:** Calculate the volume.

**Component Specification:  VolumeCalculator**

|  |  |  |  |
| --- | --- | --- | --- |
| **Component Name** | **Type(Class)** | **Methods** | **Responsibilities** |
| Calculate the Volume of the Cylinder | **VolumeCalculator** | public double calculateVolume(double radius,double height) | This method calculates the volume of the cylinder and returns the calculated volume of the cylinder  **Formula**  Volume of the cylinder =  **3.14\*radius\*radius\*height** |
| Calculate the Volume of the Cuboid | **VolumeCalculator** | public double calculateVolume(int length,int breadth,int height) | This method calculates the volume of the cuboid and returns the calculated volume of the cuboid  **Formula**  Volume of the cuboid =  **length\*breadth\*height** |

**Note:**The class and methods should be declared as public and all the attributes should be declared as private.

**Example**

Length = 3

Breadth = 2

Height = 1

**Formula**

**Volume of the Cuboid = length\*breadth\*height**

Volume of the Cuboid = 3\*2\*1= 6.00.

In the **UserInterface** class, write the main method to test the application.

**Note:**

-         The output format should be in two decimal places. Use **"System.out.printf("%.2f",percentage);"** for 2 digits after the decimal points.

-         In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.

-         Ensure to follow the object-oriented specifications provided in the question description.

-         Ensure to provide the names for classes, attributes, and methods as specified in the question description.

-         Adhere to the code template, if provided.

-         Please do not use **System.exit(0)** to terminate the program

**Sample Input 1:**

Enter the choice  
1.Find Volume For Cylinder  
2.Find Volume For Cuboid  
**1**  
Enter the radius  
**3**  
Enter the height  
**2**  
  
**Sample Output 1:**

Volume of the Cylinder is 56.52

**Sample Input 2:**  
Enter the choice  
1.Find Volume For Cylinder  
2.Find Volume For Cuboid  
**2**  
  
Enter the length  
**3**  
Enter the breadth  
**2**  
Enter the height  
**1**

**Sample Output 2:**

Volume of the Cuboid is 6.00

3.

Bloodworks Northwest is a blood bank and medical research institute headquartered in Seattle, Washington, that serves 90 hospitals in western Washington and Oregon. It has formerly been known as the Puget Sound Blood Center and King County Central Blood Bank. They have planned to conduct a blood donation camp all over America. Bloodworks Northwest decides to automate its donor's information. So, they have approached us for a JAVA program that will full fill their requirements.

**Component Specification: DonorDetails**

|  |  |  |
| --- | --- | --- |
| **Type(Class)** | **Attributes** | **Methods** |
| **DonorDetails** | String name  int age  String gender  String bloodGroup  long phoneNumber | Include the getters and setters method for all the attributes.  Include a public parametrized constructor of five arguments in the following order - name, age, gender, bloodGroup,  phoneNumber to intialize the values for the DonorDetails object |

**Note:**The class and methods should be declared as public and all the attributes should be declared as private.

In the **UserInterface** class, write the main method.

Get the values from the user.

Display the result as shown in the sample output.

**Note :**

* In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
* Ensure to follow the object-oriented specifications provided in the question description.
* Ensure to provide the names for classes, attributes, and methods as specified in the question description.
* Adhere to the code template, if provided.
* Please do not use **System.exit(0)** to terminate the program.

**Sample Input :**

Enter the name

**Robert**

Enter the age

**21**

Enter the gender

**M**

Enter the blood group

**O positive**

Enter the phone no

**8967543201**

**Sample Output:**

Name:Robert

Age:21

Gender:M

Blood group:O positive

Phone no:8967543201

4.

Shakthi cinemas have decided to automate their bookings. As an initiative, the manager outlined to development of software that would generate the booking details.

You being their software consultant have been approached to develop software to implement the functionality of calculating the ticket cost and displaying the booking details.

**Component Specification: Ticket**

|  |  |  |
| --- | --- | --- |
| **Type(Class)** | **Attributes** | **Methods** |
| **Ticket** | int ticketid  int price  static int availableTickets | Include the getters and setters method for all the attributes. |

**Note:**The class and methods should be declared as public and all the attributes should be declared as private.

**Requirement 1: Being able to calculate the ticket cost based on the number of tickets**

As per this requirement, the system should be able to calculate the ticket cost based on the number of tickets as follows,

**Component Specification: Ticket**

|  |  |  |  |
| --- | --- | --- | --- |
| **Component Name** | **Type(Class)** | **Methods** | **Responsibilities** |
| Calculate the ticket cost based on the number of tickets | **Ticket** | public int calculateTicketCost(int nooftickets) | This method should calculate the ticket cost based on the number of tickets as follows,  If the availableTickets is greater than or equal to the number of  tickets, then calculate and return the ticket cost  If the availableTickets is less than 0 or less than the number of tickets, then return -1 |

**Example**

**noOfTickets = 5, price = 100**

**totalAmount = noOfTickets \* price = 5 \*100**

**totalAmount = 500**

In the **UserInterface**class, Get the booking details as shown in the sample input.

Create an object for the Ticket class and invoke the calculateTicketCost() by passing the int numberOfTickets method in the Ticket class.

Invoke the corresponding getters to display the member details as shown in the Sample Output

If numberOfTickets is greater than availableTickets then print **"Tickets are not available"**.

If availableTickets is zero then print**"House full".**

**Note:**

* In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user and the rest of the text represents the output.
* Ensure to follow the object-oriented specifications provided in the question.
* Ensure to provide the names for classes, attributes, and methods as specified in the question.
* Adhere to the code template, if provided.

**Do not use System.exit(0) to terminate the program**  
  
**Sample Input/Output 1:**

Enter movie name

**Friends**

Enter no of bookings

**2**

Enter the available tickets

**50**

Enter the ticketid

**101**

Enter the price

**200**

Enter the no of tickets

**6**

Available tickets: 50

Total amount: 1200

Available ticket after booking: 44

Enter the ticketid

**102**

Enter the price

**100**

Enter the no of tickets

**5**

Available tickets: 44

Total amount: 500

Available ticket after booking: 39

**Sample Input/Output 2:**

Enter movie name

Captain

Enter no of bookings

**3**

Enter the available tickets

**30**

Enter the ticketid

**101**

Enter the price

**100**

Enter the no of tickets

**20**

Available tickets: 30

Total amount: 2000

Available ticket after booking: 10

Enter the ticketid

**102**

Enter the price

**200**

Enter the no of tickets

**11**

Available tickets: 10

Tickets are not available

Enter the ticketid

**103**

Enter the price

**200**

Enter the no of tickets

**8**

Available tickets: 10

Total amount: 1600

Available ticket after booking: 2

**Sample Input/Output 3:**

Enter movie name

**Titanic**

Enter no of bookings

**2**

Enter the available tickets

**10**

Enter the ticketid

**101**

Enter the price

**250**

Enter the no of tickets

**10**

Available tickets: 10

Total amount: 2500

House full

5.

Peter wants to order medicine for his grandmother, he gets the medicine and checks for the expiry of the medicine.

**Requirements**

* Get the date of manufacturing (as String) as input from the user.
* Also get the number of months of validity of that product

Calculate the expiry date by adding that months to the date of manufacturing and display the result.

Assume the given date is a valid date and the format is dd/MM/yyyy

Assume only valid month is entered.

**Note**:

* If input date is invalid, then print**"<date> is not a valid date**" and terminate the program.
* In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
* Ensure to follow the object-oriented specifications provided in the question description.
* Ensure to provide the names for classes, attributes, and methods as specified in the question description.
* Adhere to the code template, if provided.
* **Please do not use System.exit(0) to terminate the program**

**Hint**:

1. Parse the input string to Date (say Date d) using SimpleDateFormat

2. Use Calendar to add months

        Calendar c = Calendar.getInstannce();  //Get Instance

         c.setTime(dd1);   // Set date to Calendar

         c.add(Calendar.***MONTH***, month);  //add month value to the Calendar

3. Convert Calendar to Date using getTime

                     Date dd=c.getTime();

4. Use the same SimpleDateFormat and convert date to String of the format dd/MM/yyyy using the format method.

**Sample Input 1**

Enter the Manufacturing Date

**15/12/2020**

Enter the Month

**6**

**Sample Output 1**

15/06/2021 is the expiry date

**Sample Input 2**

Enter the Manufacturing Date

**15/15/2020**

**Sample Output 2**

15/15/2021 is not a valid date

6.

The AGS company has decided to give promotion based on the seniority. Help the company as a Java Programmer to do the task.

* Get the date of joining (String) as input from the user.
* Calculate the number of years of experience and display the same.

**Assumption**

1)    the given date is a valid date, and the format is dd/MM/yyyy.

2)    The current date is 15/12/2020

**Note**:

1. In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
2. Ensure to follow the object-oriented specifications provided in the question description.
3. Ensure to provide the names for classes, attributes, and methods as specified in the question description.
4. Adhere to the code template, if provided.
5. **Please do not use System.exit(0) to terminate the program**

**Sample Input 1**

Enter the date of joining

**21/8/2006**

**Sample Output 1**

14 years of experience

**Hint:**Create two Date objects- one for the input date and other for the current date. (Say d1 and d2). Find the difference between these two dates in milliseconds as

d2**.**getTime() -  d1.getTime().

Convert this millisecond to number of years