Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2021-4-1 10:13:36 **Register Number:** RA2031241010094

Q. Student Details

Design a class student representing roll no, name, height, weight.

Include a default constructor to assign values to the above members, a read() member function to get values to the above members and a display() member function to display the same.

Create two objects s1 ans s2. Call the member function read() only with s1 and display() with s1 and s2.

Default Values are as follows:

name=Nikhil
rollno=20;
height=165.5;
weight=58.2;

Source Code

```
#include <iostream>
using namespace std;
#include<string>
class student
{
  private:
  int roll;
  string name;
  float height;
  float weight;
  public:
  student()
  {
    name="Nikhil";
    roll=20;
    height=165.5;
    weight=58.2;
  }
  void read()
  {
    cin>>name>>roll>>height>>weight;
  }
  void display()
  {
    cout<<name<<" "<<roll<<" "<<height<<" "<<weight<<endl;
  }
};
int main()
{
  student s1,s2;
  s1.read();
  s1.display();
  s2.display();
 return 0;
}
```

Sample Input

Richard 95 168.5 65.3

Sample Output

Richard 95 168.5 65.3
Nikhil 20 165.5 58.2

Result

Thus, Program " **Student Details** " has been successfully executed

Q. Athithya Karihalan and his Hobby

Athithya Karihalan the Chola King has a hobby of learning about building architectures and its construction methodologies throughout india.Imagine he has given you the task of analysing the building parameters and find the stability of the building.Can you complete the prestigious task assigned to you ??

Do the following things in order to satisfy Athithya Karihalan's need..

Mandatory:

1. Create a class called Building with object name "objname"

2. Declare the following private data members or member variables

length, width and ratePerSqFeet (all of type int)

3. Create the public member functions or methods as follows:

a. Method name = initializeData()
b. Type = void
c. Access Specifier = public
d. Argument Type = 3 arguments of type int

This method is used to set the values for length, width and ratePerSqFeet. The arguments are passed to this function in the same order.

4. Create the public member functions or methods as follows:

a. Method name = getLength()
b. Type = int
c. Access Specifier = public
d. Argument Type = no arguments

This method is used to return the length of the building

5. Create the public member functions or methods as follows:

a. Method name = getWidth()
b. Type = int
c. Access Specifier = public
d. Argument Type = no arguments

This method is used to return the width of the building

6. Create the public member functions or methods as follows:

a. Method name = getRatePerSqFeet()
b. Type = int
c. Access Specifier = public
d. Argument Type = no arguments

This method is used to return the ratePerSqft of the building

7. Create the public member functions or methods as follows:

a. Method name = calculateCost()
b. Type = void
c. Access Specifier = public
d. Argument Type = no arguments

This method is used to calculate and print cost of the building.

8. Create the public member functions or methods as follows:

a. Method name = determineSuitability()
b. Type = void
c. Access Specifier = public
d. Argument Type = no arguments

This method is used to determine and print the type of the building.

9. Call all the methods from main class using the object name "objname"

Note:

Athithya Karihalan is interested in Buildings that are almost in the shape of a square. If the length and width of the building differ by atmost 10, then the building is suitable. If the difference between the length and width of the building is more than 10, then it is not suitable.

Source Code

```
#include <iostream>
#include<math.h>
using namespace std;
class building
{
  private:
  int le,wi,rate;
  public:
  void initializeData(int l,int w,int r)
  {
    le=l;
    wi=w;
    rate=r;
  }
  void getLength(int le,int wi,int rate)
  {
    cout<<"Length : "<<le<<endl;
  }
  void getWidth()
  {
    cout<<"Width : "<<wi<<endl;
  }
  void getRatePerSqFeet()
  {
     cout<<"Rate Per SqFt : "<<rate<<endl;
  }
  void calculateCost()
  {
    int z;
    z=le*wi*rate;
    cout<<"Cost of the Building : "<<z<<endl;
  }
  void determineSuitability()
  {
     if(abs(le-wi)>10)
       cout<<"Suitability : Not Suitable"<<endl;
     else if(le==wi)
       cout<<"Suitability : Suitable"<<endl;
     else if(abs(le-wi)<10)
     {
       cout<<"Suitability : Suitable"<<endl;
     }
  }
}objname;
int main()
{
  int l,w,r;
  cin>>l>>w>>r;
  objname.initializeData(l,w,r);
  objname.getLength(l,w,r);
  objname.getWidth();
  objname.getRatePerSqFeet();
  objname.calculateCost();
  objname.determineSuitability();
 return 0;
}
```

Sample Input

```
34
56
54
```

Sample Output

```
Length : 34
Width : 56
Rate Per SqFt : 54
Cost of the Building : 102816
Suitability : Not Suitable
```

Result

Thus, Program " **Athithya Karihalan and his Hobby** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2021-4-1 10:14:27 **Register Number:** RA2031241010094

Q. CRICBUZZ

International Cricket Council has ordered to BCCI to maintain the players history in one of the digital library.

So they are planning to create a software which keeps track player name and innnings etc..,

Can you help the BCCI to do this through Cricbuzz?

Mandatory:

1.Create a class "Cricket"

2.Create the following datamembers:
a)playername,
b)Jerseynum,
c)no_of_innings and
d)counter

3.Create a PARAMETERIZED CONSTRUCTOR to initialize the values to the above data members.

4.Create a member function show() to display the details of the players history.

5.Create two objects lib1 and lib2. Assign values to the members using parameterized constructor.

Note;
Use implicit method of call for first object and explicit method of call for second object and display the details using show function.

Let counter variable be a static member of the class.

Input Format:
The input must contain a single space separated jersey number, player name and no of innings.
Both lines of input must be passed to parameterized constructor.

Output Format:
Print the details of both objects.

Refer sample testcases..

Source Code

```
#include <iostream>
#include<string>
using namespace std;
class Cricket
{
  public:
  string playername;
  int jerseynum;
  int no_of_innings;
  int counter;
  Cricket(int n,string c,int no)
  {
    jerseynum=n;
    no_of_innings=no;
    playername=c;
  }
  void show()
  {
    cout<<"Jersey Num:"<<jerseynum<<endl;
    cout<<"Name of the Player:"<<playername<<endl;
    cout<<"No of Innings Played:"<<no_of_innings<<endl;
  }
  void count()
  {
    cout<<counter;
  }
};
int main()
{
  int a,b,h,d;
  string e,f;
  cin>>a>>e>>b;
  cin>>h>>f>>d;
  Cricket lib1(a,e,b);
  Cricket lib2=Cricket(h,f,d);
  lib1.show();
  lib2.show();
 return 0;
}
```

Sample Input

```
7 Dhoni 350
48 Raina 226
```

Sample Output

```
Jersey Num:7
Name of the Player:Dhoni
No of Innings Played:350
Jersey Num:48
Name of the Player:Raina
No of Innings Played:226
```

Result

Thus, Program " **CRICBUZZ** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2021-4-1 10:15:46 **Register Number:** RA2031241010094

Q. TNEB Billing

Tamilnadu has received lot of complaints regarding electicity board billing process from the customers.So Tamilnadu governemet has ordered TNEB to automate the billing process to avoid fraud.So TNEB is looking for the developer to automate according to their need.

Do the following to satisfy the requirements of TNEB.

Mandatory:

1. Create a new class named "Electric" which gets input details such as total number of customers, consumer name and units consumed.

2. Create a method "accept" with three parameters of type "int","string" and "float" respectively.

3. Function declaration should be in the format of void Electric::print_bill()

Conditions:

a) For first 100 units : 40p per unit
b) For next 200 units : 50p per unit
c) Beyond 300 units : 60p per unit

All users are charged a minimum of Rs.500. If the total cost is more than Rs.250.00 then an additional charges of 15% are added.

Refer Sample Testcases.

Source Code

```
#include <iostream>
#include<string>
using namespace std;
class Electric
{
  float unit;
  char s[20];
  public:
  void accept()
  {
    cin>>s;
    cin>>unit;
  }
  void print_bill();
};
  void Electric::print_bill()
  {
    float bill=0;
    if(unit<=100)
      bill=500+(unit*.040);
    else if(unit>100&&unit<=300)
      bill=540+((unit-100)*.50);
    else if(unit>300)
      bill=640+((unit-300)*.60);
    if(bill>250)
      bill=(bill+(bill*(15/100)));
    cout<<"\nConsumer Name:"<<s;
    cout<<"\nConsumed:"<<unit;
    cout<<"\nBill to pay:"<<bill;
  }
int main()
{
  Electric e[10];
  int i,cnt;
  cin>>cnt;
  cout<<"\nNumber of Consumers:"<<cnt;
  for(i=0;i<cnt;i++)
    e[i].accept();
  for(i=0;i<cnt;i++)
    e[i].print_bill();
 return 0;
}
```

Sample Input

```
1
ramu
209
```

Sample Output

```
Number of Consumers:1
Consumer Name:ramu
Consumed:209
Bill to pay:594.5
```

Result

Thus, Program " **TNEB Billing** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2021-4-1 10:16:15 **Register Number:** RA2031241010094

Q. Bhagavan the Inspirational Teacher

Bhagavan the Government school teacher from Karur district is so involved with his students development which in turn even forced the Tamilnadu Educational department to cancel his transfer from his old school on the request of his students.

He is such an inspirational teacher.Now he has been assigned the new set of students from other schools to train them.So before starting the training he wants to collect the personal details from the new student for maintaining the record in his school.

Can you help him to automate his task of collecting student details?

Mandatory:

1.Create a class "student"

2.Create the following datamembers:
a)roll,
b)name,
c)height and
d)weight.

3.Create a DEFAULT CONSTRUCTOR to assign the values to the above data members as follows:
name="Bhagavan"; roll=1593; height=172.5; weight=60.4;

4.Create a member function readinput() to get the values from the above members

5.Create a member function displaydata() to print the information collected from the students.

6.Create two objects s1 and s2.Call the member function readinput() only with s1 and displaydata() with s1 and s2.

Refer sample testcases

Note:

Programming Language need to be used:C++.

Source Code

```
#include <iostream>
#include<string>
using namespace std;
class student
{
  int roll;
  float height,weight;
  string name;
  public:
  student()
  {
    name="Bhagavan";
    roll=1593;
    height=172.5;
    weight=60.4;
  }
  void readinput()
  {
    cin>>name>>roll>>height>>weight;
  }
  void displaydata()
  {
    cout<<name<<" "<<roll<<" "<<height<<" "<<weight<<endl;
  }
};
int main()
{
  student s1,s2;
  s1.readinput();
  s1.displaydata();
  s2.displaydata();
 return 0;
}
```

Sample Input

```
Manikandan 156 168.5 65.3
```

Sample Output

```
Manikandan 156 168.5 65.3
Bhagavan 1593 172.5 60.4
```

Result

Thus, Program " **Bhagavan the Inspirational Teacher** " has been successfully executed

Q. Pamban Bridge

Central Government TollBooth is located at Pamban Bridge

A Car passing by the booth is expected to pay a toll.

The tollbooth keeps the track of the number of cars that gone by and the total amount of cash collected.

Mandatory:

1. Create a class named "tollbooth" with the following data members:

total number of cars passed
total toll collected.

2.Create a member function as follows to keep track of paying cars:

Name : payingcar()
Return type:Void
Parameters :One parameter of type double

Note:When any car passes through the tollbooth,that much toll gets added into total toll collected and total number of cars passed should be incremented by one.

3.Create another member function as follows to keep track of non paying cars:

Name : nonpayingcar()
Return type:Void
Parameters :No parameters

Note:Should increment the car total but adds nothing to cash total.

4.Create a member function as follows to display total number of cars passed and the total amount collected.

Name : display()
Return type:Void
Parameters :No parameters

Note:Should increment the car total but adds nothing to cash total.

5.Create a constructor that initialises both data members to zero.

6.Create an object named "obj" for the class TollBooth and access the member function payingcar(), nonpayingcar() and display() from the main function and print the result.

Input Format:

First line is the Number of Testcases

From the next line Number of testcase with Vehicle number and Toll amount collected for each testcase follows

Output Format:

Print the number of cars passed and total amount collected.

Programming Language need to be used:C++

Refer sample testcases.

Source Code

```
#include <iostream>
using namespace std;
class tollbooth
{
  int carpassed;
  float tollcollected;
  public:
  void payingcar(double pay)
  {
    carpassed++;
    tollcollected+=pay;
  }
  void nonpayingcar()
  {
    carpassed++;
  }
  void display()
  {
    cout<<"Total number of cars passed = "<<carpassed-1<<endl;
    cout<<"Total amount collected = "<<tollcollected<<endl;
  }
};
int main()
{
  tollbooth obj;
  char vehicle[10];
  float payamount;
  int i,carpassed;
  cin>>carpassed;
  for(i=0;i<carpassed;i++)
  {
    cin>>vehicle>>payamount;
  if(payamount>0)
    obj.payingcar(payamount);
  else
    obj.nonpayingcar();

  }
  obj.display();
 return 0;
}
```

Sample Input

```
3
TN401 39.5
PY401 80
TN402 0
```

Sample Output

```
Total number of cars passed = 3
Total amount collected = 119.5
```

Result

Thus, Program " **Pamban Bridge** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2021-4-1 10:17:05 **Register Number:** RA2031241010094

Q. RBI

RBI asked the Banks to move towards Core Banking where all the activities of the customers were reflected in all the branches in India.
But some of the banks are finding the transformation tough.
Can you help them to automate the bank process as per their requirements.
Mandatory:
1 . Create a class named "Bank" with the following data members to represent bank account
"name" of type "string"
"accounttype" of type "string"
"acc" of type "int"
"balance" of type "int"
2. Create a member function named "initial" of type "void" to get the initial details of the account such as name,account number,account type and balance.
3.Create a member function named "deposit" of type "void" to deal with the deposits in the account
4. Create a member function named "withdraw" of type "void" and do the following
If the requested amount is less than available balance print "Insufficient amount" else the deduce the amount from the account and print the balance.
5. Create a member function named "disp" of type "void" to display name,account number,account type and account balance.
6.Access the member functions "initial","deposit","withdraw","disp" using the object named "obj" in the main method.

Source Code

```
#include <iostream>
#include<string>
using namespace std;
class Bank
{
  char name[50];
  char accounttype[50];
  int acc;
  int balance;
  public:
  void initial()
  {
    cin>>name>>acc>>accounttype>>balance;
  }
  void deposit()
  {
    float deposit;
    cin>>deposit;
    balance+=deposit;
  }
  void withdraw()
  {
    float withdraw;
    cin>>withdraw;
    if(withdraw>balance)
    {
      cout<<"Insufficient amount\n";
    }
    else
      balance-=withdraw;
  }
  void display()
  {
    cout<<"NAME="<<name<<"\nACCNO="<<acc<<"\nTYPE="<<accounttype<<"\nBALANCEAMOUNT="<<balance;
  }
};
int main()
{
  Bank obj;
  obj.initial();
  obj.deposit();
  obj.withdraw();
  obj.display();
 return 0;
}
```

Sample Input

```
Jack 435 SB 500
1500
200
```

Sample Output

```
NAME=Jack
ACCNO=435
TYPE=SB
BALANCEAMOUNT=1800
```

Result

Thus, Program " **RBI** " has been successfully executed

Q. Online Shopping

Create a class called â€œitemâ€ representing no. of items (int), item code (int) and price (float).
Also, define the following member functions.
initialize() of type void: to initialize no. of items and read item code and price.
largest() of type float: to find and return an item with largest price.
sum() of type float: to calculate and return the sum of prices of all items;
and
displayitems() of type void: to display all items with code and price.
Input:
The no. of items must be less than or equal to 10.
The first line of the input must contain the no. of items.
The subsequent lines must contain item code and price for each item.
Output:
The output must print the largest price among all items, the total price of all items and print all items with code and price.
Refer Sample Testcases
Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class item
{
  int items;
  int itemcode[20];
  float price[20];
  public:
  void initialize()
  {
    cin>>items;
    int i;
    for(i=0;i<items;i++)
    {
      cin>>itemcode[i]>>price[i];
    }
  }
  float largest()
  {
    int i,largest=price[0];
    for(i=1;i<items;i++)
    {
      if(price[i]>largest)
        largest=price[i];
    }
    return largest;
  }
  float sum()
  {
    float sum=0;
    int i;
    for(i=0;i<items;i++)
    {
      sum+=price[i];
    }
    return sum;
  }
  void displayitems()
  {
    cout<<"Code and Price"<<endl;
    int i;
    for(i=0;i<items;i++)
    {
      cout<<itemcode[i]<<" and "<<price[i]<<endl;
    }
  }
};
  int main()
  {
    item I;
    I.initialize();
    cout<<"Largest Price="<<I.largest()<<endl;
    cout<<"Sum of Prices="<<I.sum()<<endl;
    I.displayitems();
 return 0;
}
```

Sample Input

```
5
101 23.60
107 45
112 67
190 93
110 456
```

Sample Output

```
Largest Price=456
Sum of Prices=684.6
Code and Price
101 and 23.6
107 and 45
112 and 67
190 and 93
110 and 456
```

Result

Thus, Program " **Online Shopping** " has been successfully executed

Q. Land Survey

Tamilnadu land registration authority is panning to keep track of the native addresses and total area of the flats they have.

Can you help them to do so?

Mandatory:

Create 3 classes namely "house", "address" and "room".

Let room contain length, breadth and height as members and following member functions:

getroom(): to read length, breadth and height of a room
putroom():to print length, breadth and height of a room

Include house number, city and state to be the members of the class address with following member functions:

getad(): to read house number, city and state
putad():to print house number, city and state

Let house contain house name, address (already declared class), room (already declared class) and no. of rooms as members and following member functions:

input(): to get house name, address, no. of rooms and room details
display():to display house name, address, no. of rooms and room details

Input:

The first line of the input must contain a single string denoting the house name.
The second line of the input must contain single space separated house number, city and state.
The third line of the input must be the no. of rooms.
The subsequent lines of input must have length, breadth and height of each room

Output:

The output must print the details of the house.

Source Code

```
#include <iostream>
using namespace std;
class room
{
  int l,b,h;
  public:
  void getroom()
  {
    cin>>l>>b>>h;
  }
  void putroom()
  {
    cout<<"Length="<<l<<endl;
    cout<<"Breadth="<<b<<endl;
    cout<<"Height="<<h<<endl;
  }
};
class address
{
  int hno;
  char city[30];
  char state[30];
  public:
  void getad()
  {
    cin>>hno;
    cin>>city;
    cin>>state;
  }
  void putad()
  {
    cout<<"House No="<<hno<<endl;
    cout<<"City="<<city<<endl;
    cout<<"State="<<state<<endl;
  }
};
class house
{
 char housename[30];
  address a;
  room r[10];
  int n;
  public:
  void input();
  void display();
};
void house::input()
{
  cin>>housename;
  cout<<"House name="<<housename<<endl;
  a.getad();
  a.putad();
  cin>>n;
  for(int i=0;i<n;i++)
  {
    r[i].getroom();
  }
}
void house::display()
{
  for(int i=0;i<n;i++)
  {
    cout<<"Details of Room "<<i+1<<endl;
  r[i].putroom();
  }
}
int main()
{
  house x;
  x.input();
  x.display();
 return 0;
}
```

Sample Input

```
Rangavilas
25 Coimbatore Tamilnadu
2
12 14 20
14 14 20
```

Sample Output

```
House name=Rangavilas
House No=25
City=Coimbatore
State=Tamilnadu
Details of Room 1
Length=12
Breadth=14
Height=20
Details of Room 2
Length=14
Breadth=14
Height=20
```

Result

Thus, Program " **Land Survey** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2021-4-1 10:18:58 **Register Number:** RA2031241010094

Q. Digital Library

Tamilnadu Educational Minister has ordered the Director of Higher education to make the Libraries in Government schools advanced.
So they are planning to create a software which keeps track of the books availability and respond to students request for books.
Can you help the government to do this?
Mandatory:
1.Create a class "library"
2.Create the following datamembers:
a)name
b)roll number,
c)book code and
d)counter
3.Create a PARAMETERIZED CONSTRUCTOR to initialize the values to the above data members.
4.Create a member function show() to display the details of the book
5.Create a member function count() to display counter value.
6.Create two objects lib1 and lib2. Assign values to the members using parameterized constructor.

Note:
Use implicit method of call for first object and explicit method of call for second object and display the details using show function.
Let counter variable be a static member of the class.
Input Format:
The first line of the input must contain a single space separated roll number, name and book code.
The first line of the input is also a single space separated roll number, name and book code.
Both lines of input must be passed to parameterized constructor.
Output Format:
Print the details of both objects.
Refer sample testcases..
Note:
Programming Language need to be used:C++

Source Code

```
#include <iostream>
#include<string.h>
using namespace std;
class library
{
  char name[20];
  int roll;
  int bookcode;
  int counter;
  public:
  library(char n[],int r,int no)
  {
    strcpy(name,n);
    roll=r;
    bookcode=no;
  }
  void show()
  {
    cout<<"Roll No:"<<roll<<endl;
    cout<<"Name of the Student:"<<name<<endl;
    cout<<"Code of Book Accessed:"<<bookcode<<endl;
  }
  void count()
  {
    cout<<counter;
  }
};
int main()
{
  char name[20];
  int rollno,code;
  cin>>rollno>>name>>code;
  library lib1(name,rollno,code);
  cin>>rollno>>name>>code;
  library lib2(name,rollno,code);
  lib1.show();
  lib2.show();
 return 0;
}
```

Sample Input

```
7 Dhoni 531
13 Raina 578
```

Sample Output

```
Roll No:7
Name of the Student:Dhoni
Code of Book Accessed:531
Roll No:13
Name of the Student:Raina
Code of Book Accessed:578
```

Result

Thus, Program " **Digital Library** " has been successfully executed