MC122 Lab2&3 Assignment

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Question 1:Prepare a Class diagram for all the question given in Assignment 1.

Answer:

Class Diagram for Q1 is given below:

Score
-runs : int +playername: string +balls: int +boundaries: int
+set(int) : void +get() : void

Class Diagram for Q2(a) is given below:

Reversel
+n : int
+Reversel()
+reverse() : int

Class Diagram for Q2(b) is given below:

Reverser
+n : int

+Reverser()
+reverse : void

Class Diagram for Q3 is given below:

LinearSearch
+n : int +arr[n] : int
+LinearSearch()
+search():int

Class Diagram for Q4 is given below:

room
+roomno : int +roomtype : string +roomarea : string
+setdata(int ,string ,string):void +displaydata():void

Question 2:WAP in JAVA/cpp to find the area of a circle using constructor.

Answer:
Approach:To find the area of circle using constructor, we first make the class and inside the class we make default constructor which takes radius as a input from the user. Then we make one method/function inside that class which calculates the area of circle and then we make one more method/function inside that class which display the area of circle.In main function we make one object so at that time default constructor will called which takes radius from user, then we call function calculate and display to calculate area and display area.

Given below is the code and output of it:

```
#include<iostream>
using namespace std;
class Area{//Declaring class named Area
public:
float r;
float area;

Area()//Declaring and Defining default constructor to take radius from
user
{
cout<<"Enter radius of the circle: ";
cin>>r;
}
void calculate()//Function to calculate area
{
area=3.14*r*r;
}
void display()//Defining function display to display area of circle
{
cout<<"Area of circle = "<<area;
}
};

int main()
{
Area obj;//Creating object obj

obj.calculate();//calling function calculate to calculate radius

obj.display();//calling function display to display area

return 0;
}
```

```
PS E:\OOPs assignment> cd "e:\OOPs assignment\" ; if ($?) { g++ Q2lab2and3.cpp -o Q2lab2and3 } ; if ($?) { .\Q2lab2and3 }
Enter radius of the circle: 4.5
Area of circle = 63.585
```

Question 3: WAP in JAVA/cpp to input details of student name, enrolment number, and marks in Science , Math and English. And print all the details along with their percentage as output.

Answer:
Approach:To solve this problem, we first make a class and inside it we make some variables to store student name,enrolment number,marks and percentage. Then we define default constructor which takes student name,it's enrolment number and it's marks from user and store it in variables which we have declared. Then we make one method/function percentage to calculate percentage of student. Then we make one another method/function display which display all this details which was entered by the user and also display the percentage of a student.Inside main function we create one object so at that time default constructor gets called which takes information from the user. Then we call function percentage to calculate percentage of a student and then finally we call function display to display the information and percentage.

Given below is the code and output of it.

```
#include<iostream>
using namespace std;
class Details{//Declaring class named Details
public:
string name;
int enno;
int ms;
int mm;
int me;
float per;
Details()//Declaring and defining default constructor to take input
details from user
{
cout<<"Enter student name: ";
cin>>name;
cout<<"Enter student enrollement no: ";
cin>>enno;
cout<<"Enter student marks in science: ";
cin>>ms;
cout<<"Enter student marks in math: ";
cin>>mm;
cout<<"Enter student marks in english: ";
```

```
cin>>me;
}
void percentage()//Function to calculate percentage of student
{
int sum=0;
sum=ms+mm+me;
per=(sum*1.0)/3;
}
void display()//Function for displaying details
{
cout<<"Student name: "<<name<<endl;
cout<<"Student enrollement no: "<<enno<<endl;
cout<<"Student marks in science: "<<ms<<endl;
cout<<"Student marks in math: "<<mm<<endl;
cout<<"Student marks in english: "<<me<<endl;
cout<<"Student percentage: "<<per<<endl;
}
};
int main()
{
Details obj;//Creating object obj of type Details

obj.percentage();//Calling function percentage to calculate percentage

obj.display();//calling function display to display details

return 0;
}
```

```
PS E:\OOPs assignment> cd "e:\OOPs assignment\" ; if ($?) { g++ Q3lab2and3.cpp -o Q3lab2and3 } ; if ($?) { .\Q3lab2and3 }
Enter student name: Harsh
Enter student enrollement no: 202103050
Enter student marks in science: 80
Enter student marks in math: 90
Enter student marks in english: 87
Student name: Harsh
Student enrollement no: 202103050
Student marks in science: 80
Student marks in math: 90
Student marks in english: 87
Student percentage: 85.6667
```

Question 4:WAP in JAVA/cpp to check whether a string is palindrome or not.

Answer:
Approach:To check whether string is palindrome or not, we first make the class and inside it we make a default constructor which takes string as a input from the user. Then we make one method/function ispalindrome inside that class which checks that whether given string is a palindrome or not. Inside function ispalindrome we first find the length of string and store it in n.Then we traverse through loop for n/2 times and checks whether s[i] is equal to s[n-1-i] where i is from 0 to n/2-1 if it is equal then we increment count by 1 else we break from the loop and after the loop ends we check that whether count is equal to n/2 or not. If count is equal to n/2 then we say that given string is palindrome otherwise not.

Given below is the code and output of it:

```
#include<iostream>
using namespace std;
class check{//Declaring class named check
public:
string s;

check()//Declaring and defining default constructor to take string from
user
{
cout<<"Enter string: ";
cin>>s;
}

bool ispalindrome()//Function to check whether given string is a
palindrome or not
{
int n=s.length();
int count=0;
for(int i=0;i<n/2;i++)//loop to check first and last characters and
increamenting it every time
{
if(s[i]==s[n-1-i])
count++;
else{
    break;
}
}
```

```
if(count==n/2)
{
return true;
}
else{
return false;
}
}
};
int main()
{
check ob;//Creating object ob of class check

if(ob.ispalindrome())//Checking if string is palindrome or not by calling
function is palindrome
{
cout<<"Given string is a palindrome";
}
else
{
cout<<"Given string is not a palindrome";
}

return 0;
}
```

```
PS E:\OOPs assignment> cd "e:\OOPs assignment\" ; if ($?) { g++ Q4lab2and3.cpp -o Q4lab2and3 } ; if ($?) { .\Q4lab2and3 }
Enter string: abba
Given string is a palindrome
```

Question 5: State whether the given below are valid or invalid cases of method overloading. Give a short explanations.

Case 1:
int demo(int a,int b,float c)
Int demo(int var1,int var2,float var3)

Answer:This is a invalid method of overloading because here both function have same name,same number of parameters passed and same data type of all the parameters.

Case 2:
int demo(int a,int b)

Int demo(float var1,float var2)

Answer:This is a valid method of overloading because here both function have different data type of the parameters passed.

Case 3:
int demo(int a,int b)
Int demo(int num)

Answer:This is a valid method of overloading because here both function have different number of parameters passed in it.

Case 4:
float demo(int a,float b)
float demo(float var1,int var2)

Answer:This is a valid method of overloading as though both have same number of parameters passed in it and data type of both the parameters are also same but as the order of both the parameters is different from another so due to this it is a valid method of overloading.

Case 5:
int demo(int a,int b)
float demo(int var1,int var2)

Answer:This is not a valid method of overloading because here both function have same name, same number of parameters passed in it and both parameter has same data type.

Question 5: Correct the code for Overloading methods:

Approach: For overloading we have to change the data type of parameters passed in function mymethod. So to differentiate between two function mymethod we will change the data type of parameter passed in function mymethod which has name of variables passed into function are num1 and num2 from int to double.

So the corrected code for overloading methods is given below:

```
class Demo1
{
```

```
public double myMethod(double num1, double num2)
{
System.out.println("First myMethod of class Demo");
return num1+num2;
}
public int myMethod(int var1, int var2)
{
System.out.println("Second myMethod of class Demo");
return var1-var2;
}
}
class Demo2
{
public static void main(String args[])
{
Demo2 obj2= new Demo2();
obj2.myMethod(10,10);
obj2.myMethod(20,12);
}
}
```

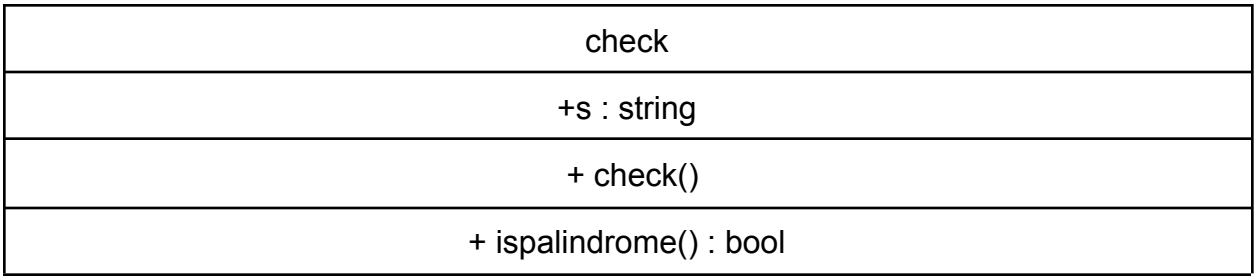
Question 6: Prepare a class diagram for Q2 and Q4 of this assignment.

Answer:

Class Diagram for Q2 is given Below:

Area
+r : float +area : float
+Area()
+calculate() : void + display() : void

Class Diagram for Q4 is given Below:


check
+s : string
+ check()
+ ispalindrome() : bool