LAB 9

| Question | Task | TIME ALLOCATION | REMARKs |
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| 1 | New and Delete operators | 40 minutes |  |
| 2 | Dynamic Array of Integers | 80 minutes |  |

**Question 1**

Complete the codes based on the given instructions that are stated below:

#include<iostream.h>

#include <math.h>

class Square

{

private: int length;

public:

void set\_data(int x)

{

#include<iostream>

using namespace std;

class ArtificialGrass

{ private: int length, width, depth;

public:

void grass\_data(int q, int r, int s )

{ length = q; width = r; depth = s; }

int grass\_gauge()

{ return length \* width \* depth; }

};

Based on the program above, modify it to include the following requirements:

(a) Define a **default constructor** that initializes the length value to 4, width value to 6,

and depth value to 3.

(c) Define a **destructor** that prints the “*Deleting the artificial grass details*.”

(d) In the main function, prepare these following codes;  
 (i) Create an object of class ArtificialGrass using the new operator.

1. Display the artificial grass’s details with invoke appropriate functions.
2. Delete the ArtificialGrass’s object.
3. Display the new stock available.
4. Create a dynamic array of 3 objects using the new operator.
5. Using a for loop, call related functions.

* Invoke the **grass\_data(..)** function with passing the value of the **counter + 2** for each declared argument in the parameter bracket.
* invoke the **grass\_gauge()** functions to print out the values.

1. Delete the object you created in (v).

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| **Sample Output Screen** |
| ++++++++++++++++++++++++++++++++++++++++  The Artificial Grass Details  ++++++++++++++++++++++++++++++++++++++++  The Previous Batch Set left. . . .  Available Grass Size: 72cm [2 pieces in one set]  Deleting the artificial grass details.  ========================================  The Stocks Available. . .  ++++++++++++++++++++++++++++++++++++++++  The Grass Size SET#1  ->> 8cm [2 pieces in one set]  The Grass Size SET#2  ->> 27cm [2 pieces in one set]  The Grass Size SET#3  ->> 64cm [2 pieces in one set]  Deleting the artificial grass details.  Deleting the artificial grass details.  Deleting the artificial grass details. |

**Question 2**

1.Create a class called **ChoreographyMarks**

(a) Data members: **points** and **total** of float type

(b) Member functions:

(i) default constructor: that initializes total to **30**

(ii) void setCgPoints( )

* + set the points based on user input

(c) class Dancer is a friend of this class.

2.Create a class called **InventiveMarks**

(a) Data members: **points** and **total** of float type

(b) Member functions:

(i) default constructor: that initializes total to **20**

(ii) void setInvPoints( )

* + set the points based on user input

(c) class Dancer is a friend of this class

3.Create a class called **Dancer**

(a) Data members: **name** of string type, **age** of int type and **finalpoints, cpoints,**

**ipoints** of float type

(b) Member functions:

(i) void set\_details( )

* + set details (name, and age) for a Dancer

(ii) void calcFinalPoints(…, …)

* + takes an object of ChoreographyMarks and an object of InventiveMarks as arguments.
  + This function initializes the cpoints(in %) and ipoints(in %) to the actual marks of the choreography points and inventive points. Use this formula: Actual Points= (Points/ Total)\*100;
  + Calculates the finalpoints (should be in %) based on the raw points(addition of points from choreographymarks object and inventivemarks object) divide by total points(addition of total from choreographymarks object and inventivemarks object)

1. getAge( )
   * returns the age

(iv) getName( )

* returns the name

(v) displayScoreDetails( )

* displays ChoregraphyMarks, InventiveMarks and Final Points, (all in %), using the appropriate data members.

4. In main( ) function

(i) prompt user to enter number of dancers to be created

(ii) create a dynamic array of objects based on the size set by user in (i),

and new operator

(iii) create an object of ChoregraphyMarks

(iv) create an object of InventiveMarks

(v) using a for loop,

* call the appropriate method to set details for each dancer
* set the points for the choregraphy and Inventive object each using the appropriate method.
* Display the name and age of the dancer using the appropriate method
* Call displayScoreDetails() using the dynamic object element to display the details of the score

(vi) delete the dynamic array of objects created in (ii).

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| **Sample Output Screen** |
| Enter number of dancers  3  :::::Details for Dancer:::::  Enter name : Marry Ann  Enter age : 21  Enter Choreography Marks [max:30] : 19  Enter Inventive Marks [max:20] : 15  =========================================  Dancer #1  =========================================  Name = Marry Ann  Age = 21  :::::Score Board:::::  Choreography : 63.3333  Inventive : 75  Final score : 68  =========================================  :::::Details for Dancer:::::  Enter name : Jane Ng  Enter age : 20  Enter Choreography Marks [max:30] : 27  Enter Inventive Marks [max:20] : 17  =========================================  Dancer #2  =========================================  Name = Jane Ng  Age = 20  :::::Score Board:::::  Choreography : 90  Inventive : 85  Final score : 88  =========================================  :::::Details for Dancer:::::  Enter name : Joanna Paul  Enter age : 19  Enter Choreography Marks [max:30] : 18  Enter Inventive Marks [max:20] : 14  =========================================  Dancer #3  =========================================  Name = Joanna Paul  Age = 19  :::::Score Board:::::  Choreography : 60  Inventive : 70  Final score : 64  ========================================= |