C++ Notes on Unit-III

Constructor & Copy Constructor

By

Prof. P. J. Mokashi

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THE PARTY OF THE P	Constructor in Ctt *
	& Office of
	In cH a constructor is a
	Special member function whose task
	is to initialize the objects of its
	class. It is special because its nor
1 140	is some of the class name.
	The Constructor is invoke
	whereever on objects of its ossociate
	closs is created. It is called
	constructor, because It constituts
	the value of data members of H
	Specific dons.
	The general Representation
	of constauetor inside every closs is
	/ palone field
	Class Collège
	£
	=======================================
1 177 40	public : " " " " " " " " " " " " " " " " " "
	Collège ()
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	in final in
	in the same of the
	7 2 1 18 6 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	3;



In the above expresentation College is nothing but the name of the class and college () is nothing but the name of the constructor. According to the concept, the name of the constructor is some as closs name The Constructor have some special Characteristics which are given below! O Constructor should be decleared inside the public section of every Class. @ They are invoke automatically when the objects are created. 3) They do not have any Esturntype not even void & there fore they Connot Eeturn any value. 4 like functions, constauetor have Some défault agguments. (5) An object with a constructor a well as desti destructor cannot be used as a member of union,

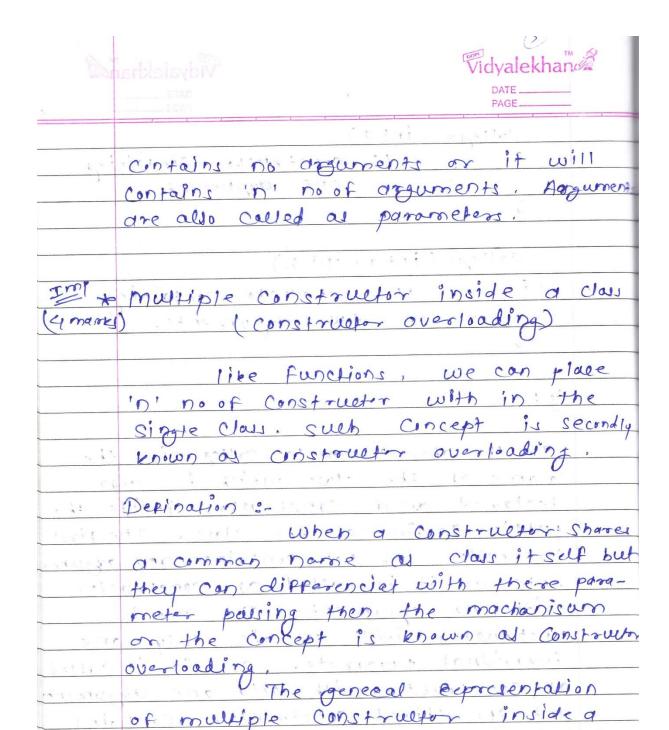
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* Parameterise Constructor	*
* Parameter Com	cap place
like functions	we can place Constructor. The
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an arguments generally arguments generally or placed inside the	we arning and
argument inside the	Constaulton.
or placed inside the closing brackets of e	very to be pood-
closize brackets of e Constructor is s	ntains organients
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that the margarete	23 000
'n' no of	nstructo instation
of parameteries con	eal of shown
er parameteries con	Structor.
below:	2. 1 M 2 3 M 2
	ANGION DA (A)
clos collège	10 10 100 10
2	10 KUI A
	1) // Constructor
public : College	Containing no
£	orgweent.
5	



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	Collège (inta)
	f // constructor containing
13/5 17	one arguments.
	3. and second or before a domestic
	collège (inta, int b)
ui!	2 11 constructor containing
	two arguments.
	3
5 9 %	in not not exit self
5.1	174; it between a street to prove the contract of the
Trekla	The tarries again continuents
	In the above example collège is the
	name of the class which is also
	declared ou a constructor inside to
10000	public section of the class. The Ris
Aud -	constructor does not contains any argu
- 5.5%	ents so it is called as constructor
<u> </u>	with no arguments. The second
of the s	constructor will contain only one
	individual parameter so it is cal
	as constructor with only one organ
	and the thired constructor contain
1,0	two agaments so it is called a
	constructor with two arguments.
	note that every constructor will est



Siggle class is Represented below:



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1	Pinte:	the same of
	5 Priverte: int 9,6;	
	Public:	
	(ollege ()	
***	The state of the s	
	cout < < " const	13 3 4 5 1 1 1 K.
	College (inta)	28 87 061
	Middle & total delay seems	and the same
	cout <<" constau	etor 2";
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1.5	collège linta, i	n+ b)
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	cout << " constru	ctor 2 11 1
	a Handanil entre	
	7 201000 22 20 200	
ar t	In the above example co nathing but the name of which contains three of	37 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
410-75	¿ Void main ()	A
	to the above come?	ege C11
	nathing 111t	llege 15
	which contribute of	the class
		0 4 4 0 - 1 4 1 4 -
	The Canalagua	A 1
	enciate with there parame	ten passing.



So the example will fullfill the concept of constructor overloading i.e. multiple constructor inside a single class.

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* Constauctor with Default argument like functions, it is also possible to define or declare a constructors with some default volves which are also called as default anguments, these agguments dre nathing but some valid values gous to the constructions. The default arguments are place inside the openning and closing brackets of every construction. The general expresentation of the constructor with some default volues are, Ollege (3,4); Sarople (1,2,1,5,1,9); where college and sample are

two Constructor.



	4.3.65	PAGE
		noncem will demostrates
	The Pollowing	program will demostrates
	the Concept	of construction in ctt.
		1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
	11 brodson t	or constructor
	#include < ic	stream.h>
	Class Integer	
as	& privates	and a grown a comment with
	ì	nt m, D; in the transp
	public :	1 3 6 4 3 8 1 2 2 2 8 8 1
	Topije.	Integer (intx, inty)
	8	
		mex;
		n=y; construct
	2.	so a ser de celle.
	0	id display ()
	· ·	ut<<'' value of m = " << m;
	Co	ut < value of m = "Compare"
	Col	ut <<" value of n="<< n;
	3	
	3;	
	void mai	n()
-	۶	
	Thteger	id (10,100); i2 (50,73);
	tnteses	i2 (50,73);
	- 1	

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	PAGE PAGE	
2.1	Care Cill A	
1 1	Cout (" Constructor 1:11;	
	II display (1)	
	Constructor 2:	
-	12. display ()	
-	3 34.000.4200 3 06.0134613	
-		
-	The above program will generate	e an
	output as:	
+	Constructor 1:	
-	value of m = 10	
_	value of n = 100 %	
	1 3 2 5 7	
	Constructor 2:	
	volue of no = 50	
	value of n= 75	
1	carried to the contract of the same	
	STORY OF THE STORY OF THE STORY	

```
// Pgm for Constructor in C++
#include<iostream.h>
#include<conio.h>
class Integer
{
private: int m,n;
public: Integer(int x,int y)
m=x;
n=y;
}
void display()
cout<<''\n Value of m= ''<<m;
cout<<''\n Value of n= "<<n;
}
};
void main()
{
clrscr();
cout<<''\n\t\t ******* OUTPUT ******";
Integer i1(10,100);
Integer i2(30,250);
cout<<''\n Constructor 1:";</pre>
i1.display();
cout<<"\n Constructor 2:";</pre>
i2.display();
getch( );
}
                ***** OUTPUT *****
Constructor 1:
Value of m = 10
Value of n = 100
Constructor 2:
Value of m = 30
Value of n = 250
```



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*	Destructor :-
	like Constructor, destructor
	plays an important eale in ctt.
	Describer 14 houseally used to
	alistory the objects or the memicy
	which how been created by a constru-
	ctor. like constanting by a constru-
+ +	ctor. Like constructor, the destructor
	is also a member function whose
-	nome is some as closs nome but
	porteded with filde sian
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	With name sample then the dark un
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o ha	expresentation is shown below:
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- 1	The destructor never of	101.
1 7 - 1	arguments not we can	are any
7 K	Chu volus Ti	perun
	ony volue. It will be	invoke
	by the compilar then exit	toom
	the program. The destroy	ctor deallo-
	care the memory space of	e or Clean
31	of the stoeage space whi	chis
9	no logges occessible	717.00
-	Note that the	destructor
	in a program is basically	wed to
	ecleased the memory space	· for
	farther used.	rent n
	The following program	4.511
		distructor
	in CH.	aust ruller
	2 1 1 1 3	5.67
		4
		10

	(wid Alt + F5 key for destructor output
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	11 program for Destructor
	Class Deroo management
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	Private:
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· ·	and the state of t
	Publica:
~ i.	Demol)
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	Cout << " This is constructor";
2	a red some as yet a ser make make me
0.23	riberros()
À	
Uolu Fe	Cout << " This is Destructor";
+ ~	
de	3:
	void main ()
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	perso di i de ;
7	1
	y and the second of the second
	The value and it
	The above program will generate
	as output as:
	This is Constructor
4:	This is constructor
	This is Despuctor
	This is Destaucton.

```
// Pgm for Destructor
#include<iostream.h>
#include<conio.h>
class Demo
{
private: int a,b;
public: Demo()
cout<<"\n This is Constructor";</pre>
~ Demo()
cout<<"\n This is Destructor";</pre>
};
void main()
clrscr();
cout<<''\n\t\t\t ****** OUTPUT ******";
Demo d1,d2;
getch();
}
                     ***** OUTPUT *****
This is Constructor
This is Constructor
This is Destructor
This is Destructor
```



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	This is Destructor	1
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	* 15 1 7 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ķ-
*	Copy Constructor : (Imp	Cwask)
	The copy construct	Yang territoria de la companya del companya del companya de la com
	also a member function a	uhich
-	initializes an object wing	another
	object of the same class.	Secondly
10101	we can also say & that a (opy
	constructor is a Constructor	which
	creates an object by initi	alizine
	it with an object of the	Same
	Class which has been create	d previous.
	A copy constructor;	s wid
	to,	
	O Initializar one object fro	in another
	of the same claw.	0 1/
	2) Copy an object to pass is	
	an argument to the func	Mon.
	an argument to the func	et as
	an dogument from the fur	oction.
500	The a copy constru	letor is
	not defined inside the class	, the
	Compilar it self defines one	e. iP
	the class contains a printer	ugeiable
	Q # 2 0 00 - 12 - 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	



plate that: a reference variable has been and agricult to the long Contentor and how same dynamic memory allecations then in a such situation the class must contains. A copy constructor can be constructor. A copy constructor can be constructor and be constructor. A copy constructor can be collect of a class is extend by value. (a) when an object of the class is possed to the function by value as an argument. (a) when an object is constructed based on another object of the same class. (b) when a compilor generates an tempory object. (a) when a compilor generates an tempory object. (b) when a compilor constructor is: (c) class name (constant class name sobject) (c) body of constructor (c) constructor (c) constructor (c) constructor (c) constructor	Vidyaleknarus	Vidyalekham
and how same dynamic member allications then in a such situation the class must contains. A copy constructor can be constructor. A copy constructor can be called. O when an object of a class is estuan by value. (a) when an object of the class is possed to the function by value as an argument. (b) when an object is constructed based on another object of the same class. (c) when a compilar denecates an temporal object. The genecal syntax for expresentating copy constructor is constructor is constructor.	Note that: a reference	Vanable has 1 PAGE
and how same dynamic member allications then in a such situation the class must contains. A copy constructor. A copy constructor can be called. O when an object of a class is estuan by value. (a) when an object of the class is possed to the function by value or an argument. (a) when an object is constructed based on another object of the same class. (b) when a compilar generates an temporary object. The general syntax for expresentating copy constructor is constructor. Class name (constructor.	argument of	the Copy Contructor.
the class must contains. A copy Constructor. A copy constructor can be Colled (1) When an object of a class is ectuan by value. (2) when an object of the class is passed to the function by value as an argument. (3) When an object is constructed based on another object of the same Class. (4) When a compilar generates an temporary object. The general syntax for expresentating copy constructor is: Class name (constructor though of constructor	and how some	dynamic memori
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A copy constructor can be called (a) when an object of a class is extract by volves. (a) when an object of the class is possed to the function by volve as an argument. (b) when an object is constructed based on another object of the same class. (c) when a compilar generates an temporary object. (d) when a compilar generates an temporary object. The general syntax for expresentating copy constructor is: (c) class name (constant class-name sobject) (d) body of constructor	the cont wait	rontains. A Coru
O when an object of a class is exturn by volves. (a) when an object of the class is possed to the function by value as an argument. (b) when an object is constructed based on another object of the same Class. (c) when a compilar generates an tempory object. The general syntax for expresentating copy constructor is: (c) class name (constant class-name & object) A body of constants	constauctor.	
O when an object of a class is exturn by volves. (a) when an object of the class is possed to the function by value as an argument. (a) when an object is constructed based on another object of the same Class. (a) when a compilar denerates an tempory object. The general syntax for expresentating copy constructor is: (class name (constant class-name 20)) A body of constants	A Copy	constructor can be
Description by value as an argument. By when an object is constructed based on another object of the same Class. Class. The general syntax for expresentating copy constructor is: Class name (constructor) Lass name (constructor) Lass name (constructor)	Caura	
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B) when an object is constructed based on another object of the same Class. Class. (a) when a compilar generates an temporary object. The general syntax for expresentating copy constructor is: Class name (constant Class-name 80bject) Sody of constructor	THE TWICHON	by value as an'
Clous. (D) When a Compilor denceates an temporary object. The general syntax for expresentating copy constructor is: Clous name (constant clous-name 80bject) Enough of constructor	(3) Whan and in a	•
(a) when a Compilar denceates an temporey object. The general syntax for expresentating copy constructor is: Class name (constant class-name 20bject) Endy of constructor	on another al	15 Constructed based
Object. The general syntax for expresentating copy constructor is: Class name (constant class-name 8-object) { body of constructor }	Class Class	ect of the same
Object. The general syntax for expresentating copy constructor is: Class name (constant class-name 20bject) Expresentating copy constructor Sobject.	@ when a compilar	Y Ach Caches at 1
expresentating copy constructor is: Class name (constant class-name 20bjet) body of constructor		type temperature to make
Class name (constant Class-name 80bjet) { body of Constanter }	The gener	ed Cuntar C-
Class name (constant Class-name 80bjet) { body of Constantor	Expresentating copy	Constanting is
body of Constructor		
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	the surference is a mailton and of
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0.4	As per the sepresentation of d
	Copy construction; et is basically used
	to declared and initialized an object
13 = 1	from another object. The process of
	initializing an object through a
	copy constructor is known as copy
	101Halization.
	Note that o copy constructor
_b/3 1	can also used as a sefarance variable
	as its argument.
	following program will demon- states the used to copy constructor
	states the week to copy constructor
	9n CH.

```
// Pgm for Copy Constructor
#include<iostream.h>
#include<conio.h>
class Demo
{
private: int x,y;
public:
      Demo(int x1,int y1)
{
      x=x1;
      y=y1;
}
      Demo(const Demo &d2)
{
      x=d2.x;
      y=d2.y;
int getX()
{
      return x;
int getY()
{
      return y;
}
    };
void main()
{
clrscr();
cout<<''\n\t\t\t ****** OUTPUT *****'';
Demo d1(10,15); //Normal Constructor is called
Demo d2=d1;
                    // Copy Constructor is called
cout<<''\n d1.x= ''<<d1.getX();
cout<<''\n d1.y= ''<<d1.getY();
cout<<''\n d2.x= ''<<d2.getX();
cout<<''\n d2.y= ''<<d2.getY();
getch();
}
                                ***** OUTPUT *****
d1.x=10
d1.y = 15
d2.x = 10
d2.y = 15
```

Question Bank on Unit-III

- 1) What is class? Explain how class can support the concept of data hiding?
- 2) Explain how class can be declared in C++ with example.
- 3) Write difference between Class in C++ & Structure in C.
- 4) What is object? Explain how class members can be accessed using objects with example.
- 5) Explain friend function with suitable program.
- 6) What is constructor? Explain with suitable program.
- 7) Explain how multiple constructors can be declared inside a class with example.
- 8) What is destructor? Explain with suitable program.
- 9) Write difference between Constructor & destructor.
- 10) Explain copy constructor with suitable program.
- 11) Write difference between Constructor and Copy constructor.
- 12) Write a program which demonstrates the concept of class & objects in C++.