CDAC Mumbai PG-DAC August 24

Assignment No-4

1) Write a program that demonstrates widening conversion from int to double and prints the result.

```
CODE:

package org.example;

public class Program1 {
    public static void main(String[] args) {
        int num = 10;

        double num1 = num;

        System.out.println("Int to Double Number: "+num1);
      }
}

OUTPUT:

Int to Double Number: 10.0
```

2) Create a program that demonstrates narrowing conversion from double to int and prints the result.

```
CODE:
```

```
public class Program2 {
    public static void main(String[] args) {
        double num = 10;

        int num1 = (int) num;

        System.out.println("Double to Int: "+num1);
    }
}

OUTPUT:

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Double to Int: 10
```

3) Write a program that performs arithmetic operations involving different data types (int, double, float) and observes how Java handles widening conversions automatically.

```
CODE:
package org.example;
public class Program3 {
    public static void main(String[] args) {
         int num1 = 10:
         float num2 = 20.2f;
         double num3 = 30.3;
         //Addition
         double sum = num1 + num2;
         System.out.println("Addition of int & float: "+ sum);
         double sum1 = num2 + num3;
         System.out.println("Addition of float & double: "+
sum1);
         double sum2 = num1 + num3;
         System.out.println("Addition of int & double: "+
sum2);
         System.out.println("-----");
         //Substraction
         double sub = num1 - num2;
         System.out.println("Substraction of int & float"+ sub);
```

```
double sub1 = num2 - num3;
         System.out.println("Substraction of float & double: "+
sub1);
         double sub2 = num1 - num3;
         System.out.println("Substraction of int & double: "+
sub2);
         System.out.println("-----
         //Multiplication
         double mul = num1 * num2;
         System.out.println("Multiplication of int & float: "+
mul);
         double mul1 = num2 * num3;
         System.out.println("Multiplication of float & double:
"+ mul1);
         double mul2 = num1 * num3;
         System.out.println("Multiplication of int & double: "+
mul2);
         System.out.println("-----");
         //Division
         double div = num1 / num2;
         System.out.println("Division of int & float: "+ div);
         double div1 = num2 / num3;
         System.out.println("Division of float & double: "+
```

```
div1);
         double div2 = num1 / num3;
         System.out.println("Division of int & double: "+
div2);
         System.out.println("-----
     }
OUTPUT:
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Addition of int & float: 30.200000762939453
Addition of float & double: 50.50000076293945
Addition of int & double: 40.3
 ______
Substraction of int & float-10.200000762939453
Substraction of float & double: -10.099999237060548
Substraction of int & double: -20.3
Multiplication of int & float: 202.0
Multiplication of float & double: 612.0600231170655
Multiplication of int & double: 303.0
Division of int & float: 0.49504947662353516
Division of float & double: 0.6666666918461865
Division of int & double: 0.33003300330033003
```

4) Write a Program that demonstrates widening conversion from int to (double,float, boolean, string) and prints the result.

```
CODE:
package org.example;
public class Program4 {
     public static void main(String[] args) {
          int num = 10:
          double num1 = (int) num;
          System.out.println("Int to Double: "+num1);
          float num2 = (int)num;
          System.out.println("Int to Float: "+num2);
          boolean num3 = (\text{num } != 0);
          System.out.println("Int to Boolean: "+num3);
          String <u>str</u> = Integer.toString(num);
          System.out.println("Int to String: "+num);
OUTPUT:
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Int to Double: 10.0
Int to Float: 10.0
Int to Boolean: true
Int to String: 10
```

INTERVIEW QUESTIONS

1. What does the static keyword mean in Java? Explain the difference between static and non-static methods.

	Page
PE	L. Static keyword Pn Java Indicates that a member
	(variable or method) belongs to the class, rather
	than to any pawfcular instance of the class. This means that static keyword member is shared among
100	all instance of the class
204	to alloyeded ante percent, range trans are
	static Method
	· Static Method can access in same class directly by
	class Name.
OUT !	Cannot call access instance variables or method directly
•	(can be called without creating an instance of class
2301 34	Belong to class rather mon object.
	Syntan : ClassName. method Name ();
	0
*	Non-Staff Method
-tud-	Non-Static Method can acress in same or different
	class by creating instance of class
•	Can access both Static & non-static voriables freeholy
west .	Must be called on an Enstance of the class
famile!	Belong to an instance of the class
NA	Syntax = Pristance, method Name ():
	- frances (visional a vivaria a rapine ()?
	paristrates to ex 21
20	Static method get space in method area. Non-static method get space inside Meap area.
0	Mon-Static method get space inside Mean area
Trans	the hour execution the a states was table the time
45	Can make the state of the contract of the cont

2. What is the role of the static keyword in the context of memory management.

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2,	The Static keyword affects memory management by
her	(Nationale of spectros) between a side of the
	class Level Starage:
pro	Static variables & methods are stored in the
	method area, not on the heap. this memory
	9s allocated once per class, rather than once per
	Instance.
- just	patient of the state of me was and badien allowed
	Shaved Across Instance;
Hose	AU Pristances of the class share the same static
1	variables & methods changing a statie variable
THE ST	thorough one instance affects all instance of class
	Clarette method 100 cm

3. Can static methods be overloaded and overridden in Java? Howstatic variables shared across multiple instances of a class?

3.	Static Methods can be overloaded. Overloading occurs
1,000	When multiple methods have the same name but
	deferent parameter lists.
10001900	\$ 12 () midely \$1,000 5 (2.11) \$ 20.010 (0.003) (2.10) \$ 1.00
	Statie methods cannot be overvådden because they are not
	acsocrated with Instances. They can be hidden by dielaning
	a state method with same name in subclass, but this
	ic not overriding
	as sent matted as speak in method asset
	Statie Variables aux staned alross ell Instance of 9
N 8 - 10 - 1	A show to a stodie was able is defeated
	across all Instance, as there is only one copy of
	that variable.

4. What is the significance of the final keyword in Java?

E	Date
4,	The Final keyword in Java is used to dellare
	Constant.
HITTO .	It prevent method overriding & inheritance.
0	Final variables & once initialized, their value
	cannot be changed.
Aniad .	Final Method: Cannot be overeiden by subclasse
	Final classes : Cannot be subclassed or extended

5. What are narrowing and widening conversions in Java?

	111111111111111111111111111111111111111
<u> </u>	· Widening conversion . Automatic (implict) conversion
49.	from a smaller to a larger data type.
70-	This conversion does not lost information & is
1601	performed automatically by gavo.
	otob Jash
0	Marrowing Conversion: Manual conversion from
	larger to a smaller data type. This conversion
A noin	may lose information, & englicit tasting is required.
	Control of the state of the sta

6. Provide examples of narrowing and widening conversions between primitive data types.

6.	Widening Conversion example:	
n seizer	int hum = 10; of spirit with addington	
	double num1 = num;	
100423	- Commercial Commercia	7
decice)	common the converted value inclusions their vep	
	double num = 10.11; and longer	
	gut num1 = (gnt) whum;	
		-
		_
The Control		

7. How does Java handle potential loss of precision during narrowing conversions?

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_	
70	I are handles potential loss of precision during
	naturating conversions by:
	Java handles potential loss of precision during naturousing conversions by: Truncation & For numeric types, fractional part are discarded (eg: double to int)
	one discarded (eq: double to int)
	shinning d tagana
pinst.	· Rounding & when converting between floating poin
	· Rounding : when converting between floating point types, rounding may occur.
	0'

8. Explain the concept of automatic widening conversion in Java.

8.	Automatic widewing conversion :
	Java automatically converts semaller data types to
	larger data types when performing operations or assignments. This is safe because it does not
	assignments. This is safe because it does not
	lose data.

9. What are the implications of narrowing and widening conversions on type compatibility and data loss?

g. The implications of nameowing & widening conversions on type compatibility & data lose are.

Widening conversion is safe & do not lose data. They are compatible with larger data types & do not require explicit costing.

Nameowing conversion is May lose data & require explicit casting. The converted value might not fully represent the original value due to truncation or rounding.