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DEPARTMENT OF INFORMATION
AND COMMUNICATION TECHNOLOGY

DFP30243:
OBJECT ORIENTED PROGRAMMING

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NAME OF TASK:	LAB ACTIVITY 3

LAB ACTIVITY 3:
CLASSES AND OBJECTS

Learning Outcomes:

By the end of this laboratory session, you should be able to:

1. **Implement type casting to change the data type**
2. **Implement input stream (System.in) and output stream (System.out) in Java programming.**
3. **Write Java program using variables, operators and Input/Output stream**

Hardware/Software: Computer with JDK latest version.

Activity 3A

Activity Outcome: Implements typecasting in Java programs.
The following program shows the implicit and explicit type casting.

Procedures:
Step 1: Open Notepad and type the following code:

```
class Act3A
{
        public static void main (String[] args)
        {
                System.out.println("Variables created");
                //variable declaration & initialization
                char char1= 'x';
                byte numB= 50;
                short numS1 = 1996;
                int numI = 32770;
                long numL= 134353453L;
                float numF1 = 3.142F;
                double numD = 0.000000987;

                //display the value of each variable
                System.out.println("char1 = " + char1);
                System.out.println("numB = " + numB);
                System.out.println("numS1 = " + numS1);
                System.out.println("numI = " + numI);
                System.out.println("numL = " + numL);
                System.out.println("numF1 = " +numF1);
                System.out.println("numD = " + numD);
                System.out.println("  ");
```

```
                System.out.println(" Types converted" );
                short numS2 =  numB;   // implicit type casting
                short numS3 = (short) numI;  //explicit type casting

                //from integer change to floating point
                float numF3 = (float) numI;

                //from floating point turn to be integral type
                int numI2 = (int) numF1;

                //display the output
                System.out.println(" short numS2 =  " + numS2);
                System.out.println(" short numS3 =  " + (short)numI);
                System.out.println(" float numF3 =  " + numF3);
                System.out.println(" int numI2 =  " + numI2);
        }//end main()
}//end class
```

Step 2: Save, compile and run the program. Save the program as `Act3A.java`. Observe the output.

Output:

```
Variables created:
char1= x
numB= 50
numS1= 1996
numI= 32770
numL= 134353453
numF1= 3.142
numD= 9.87E-7

Types converted
short numS2= 50
short numS3= -32766
short numF3= 32770.0
int numI2= 3
```

Activity 3B

Activity Outcome: Implements input stream (System.in) and output stream (System.out) in Java programs.

The following program show how to accepts input data using input stream, convert string value to integer and display data using output stream**.**

Procedures:

Step 1: Open Notepad and type the following code:

```
//import package io to use InputStreamReader & BufferedReader class
import java.io.*;

class Act3B
{
	public static void main (String[] args) throws IOException
	{
		InputStreamReader inStream = new InputStreamReader(System.in);
		BufferedReader stdin = new BufferedReader(inStream);

		//declare variable
		String str;
		int age;

		System.out.println("Enter your age:");
		str = stdin.readLine(); //read input that is entered by user
		age = Integer.parseInt(str); // convert str to int

		//display an input that was entered by user
		System.out.println("Your age is: "+age);
	}//end main()
}//end class
```

Step 2: Save, compile and run the program. Save the program as `Act3B.java`. Observe the output.

Output:

```
Enter your age:
20
Your age is: 20
PS C:\Users\HP\Desktop\Diploma Teknologi Makl
bject Oriented Programming)\Assignment\Lab Ac
```

Activity 3C

Activity Outcome: Implements input stream (System.in) and output stream (System.out) in Java programs.

The following program below show how to accept input from the command line.

Procedures:

Step 1: Open Notepad and type the following code:

```
//Program that need to run in command line
class Act3C
{
	public static void main (String[] args)
	{
		//declare variable
		String str;

		//read input that is entered by user during execution
		str =args[0];

		//display an output, str value
		System.out.println("You have entered: " + str);
	}//end main()
}//end class
```

Step 2: Save, compile and run the program. Save the program as `Act3C.java`. Observe the output.

Output:

```
C:\Users\HP\Desktop\Diploma Teknologi
t\Lab Activity 3>java Act3C BobRamen
You have entered: BobRamen
```

Activity 3D

Activity Outcome: Implements input stream (System.in) and output stream (System.out) in Java programs.

The following program below show how to accept input and use mathematical operator to calculate the numbers that is entered by user.

Procedures:
Step 1: Open Notepad and type the following code:

```
//import package io to use InputStreamReader & BuffredReader class
import java.io.*;

class Act3D
{
	public static void main (String[] args) throws  IOException
	{
		BufferedReader inData = new BufferedReader(new InputStreamReader(System.in));

		//declare variable
		String str;
		String num1, num2, num3;
		int number1, number2, number3;

		System.out.println("Enter your name : ");
		str = stdin.readLine();//read input that is entered by user

		System.out.println("Enter first number : ");
		num1 = stdin.readLine();//read input that is entered by user
		//convert @parsing String(num1) to integer data type
		number1=Integer.parseInt(num1);

		System.out.println("Enter second number : ");
		num2 = stdin.readLine();//read input that is entered by user
		//convert @parsing String(num1) to integer data type
		number2=Integer.parseInt(num2);

		System.out.println("Enter third number : ");
		num3 = stdin.readLine();//read input that is entered by user
	       //convert @parsing String(num1) to integer data type
```

```
                number3=Integer.parseInt(num3);



                //calculate number1, number2 & number3
                 int total = number1+number2*(number3/number1);

                 //display output
                 System.out.println("Details:");
                 System.out.println("Name entered: " + str);
                 System.out.println("Number entered: " + number1 +
                     "," + number2 + "," + number3);
                System.out.println("The total is: "+ total);
        }//end main()
}//end class
```

Step 2: Save, compile and run the program. Save the program as `Act3D.java`. Observe the output.

Output:

```
($?) { java Act3D }
Enter your name:
Afiq
Enter first number:
10
Enter second number:
10
Enter third number:
10
Details:
Name entered: Afiq
Number entered:10,10,10
The total is: 20
```

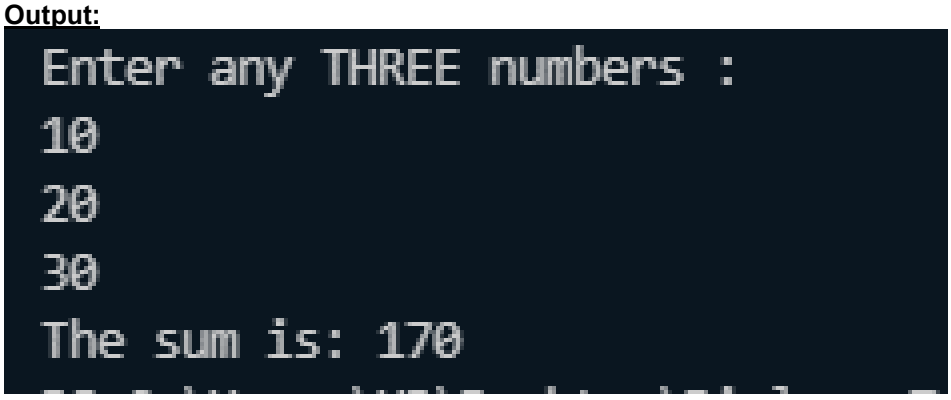
Activity 3E

Activity Outcome: Implements input stream (System.in) and output stream (System.out) in Java programs.
The following program show how to accept input and use mathematical operator to calculate the numbers entered by user. This program is used Scanner class from util package to accept input from user.

Procedures:
Step 1: Open Notepad and type the following code:
Step 2: Save, compile and run the program. Save the program as `Act3E.java`. Observe the output.

```
//import util package to use Scanner class
import java.util.*;

class Act3E {
	public static void main(String[] args) {
		System.out.println("Enter any THREE numbers : ");
		//create object of Scanner to invoke method from Scanner class.
		Scanner sc = new Scanner(System.in);

		/*A Scanner breaks its input into tokens using a delimiter pattern, which by default matches
		whitespace. The resulting tokens may then be converted into values of different types using
		the various next methods.*/

		int num1 = sc.nextInt();
		int num2 = sc.nextInt();
		int num3 = sc.nextInt();

		//calculate num1, num2, num3
		int sum = num1*num2-num3;

		//display an output, sum
		System.out.println("The sum is: "+sum);
	}//end main()
}//end class
```

Output:



State the differences between InputStreamReader class and Scanner class:

Scanner Class	InputStreamReader
Scanner is slower in terms of performance	InputStreamReader is faster in terms of performance
Scanner can't read whole document character by character	InputStreamReader can read whole document character by character
Scanner is not easy to control its function	You have more control if you use InputStreamReader