**Name: Kunal Porwal**

Lab exercise 29:

**package** com.hsbc.exercise29.shapes;

**public** **class** TestShapes {

**public** **static** **void** main(String[] args) {

//Creating objects of methods

Square square = **new** Square();

Triangle triangle = **new** Triangle();

Circle circle = **new** Circle();

//Calling methods using object

square.disp();

triangle.disp();

circle.disp();

}

}

**class** Square{

**void** disp() {

System.***out***.println("In Square class");

}

}

**class** Triangle{

**void** disp() {

System.***out***.println("In Triangle class");

}

}

**class** Circle{

**void** disp() {

System.***out***.println("In Circle class");

}

}

Lab exercise 30:

Deer.java

**package** com.hsbc.exercise30.org.animals;

//Model class

**public** **class** Deer {

String color;

**double** weight;

**int** age;

**public** **boolean** isVegetarian() {

**return** **true**;

}

**public** **boolean** canClimb() {

**return** **false**;

}

**public** String sound() {

**return** "Deer\_sound";

}

}

Elephant.java

**package** com.hsbc.exercise30.org.animals;

//Model class

**public** **class** Elephant {

String color;

**double** weight;

**int** age;

**public** **boolean** isVegetarian() {

**return** **true**;

}

**public** **boolean** canClimb() {

**return** **false**;

}

**public** String sound() {

**return** "Elephant\_sound";

}

}

Giraffe.java

**package** com.hsbc.exercise30.org.animals;

**public** **class** Giraffe {

String color;

**double** weight;

**int** age;

**public** **boolean** isVegetarian() {

**return** **true**;

}

**public** **boolean** canClimb() {

**return** **false**;

}

**public** String sound() {

**return** "Giraffe\_sound";

}

}

Lion.java

**package** com.hsbc.exercise30.org.animals;

**public** **class** Lion {

String color;

**double** weight;

**int** age;

**public** **boolean** isVegetarian() {

**return** **false**;

}

**public** **boolean** canClimb() {

**return** **true**;

}

**public** String sound() {

**return** "Roar";

}

}

Monkey.java

**package** com.hsbc.exercise30.org.animals;

**public** **class** Monkey {

String color;

**double** weight;

**int** age;

**public** **boolean** isVegetarian() {

**return** **true**;

}

**public** **boolean** canClimb() {

**return** **true**;

}

**public** String sound() {

**return** "monkey\_sound";

}

}

Tiger.java

**package** com.hsbc.exercise30.org.animals;

**public** **class** Tiger {

String color;

**double** weight;

**int** age;

**public** **boolean** isVegetarian() {

**return** **false**;

}

**public** **boolean** canClimb() {

**return** **true**;

}

**public** String sound() {

**return** "Roar";

}

}

VandlourZooland.java

**package** com.hsbc.exercise30.zoo;

**import** com.hsbc.exercise30.org.animals.\*; //Package imported from another project jar

//Caller

**public** **class** VandalurZooand {

**public** **static** **void** main(String[] args) {

Lion lion=**new** Lion();

Tiger tiger = **new** Tiger();

Giraffe giraffe=**new** Giraffe();

Deer deer = **new** Deer();

Monkey monkey = **new** Monkey();

System.out.println("lion.canClimb():"+lion.canClimb());

System.out.println("lion.isVegetarian():"+lion.isVegetarian());

System.out.println("lion.sound():"+lion.sound());

System.out.println("tiger.canClimb():"+tiger.canClimb());

System.out.println("tiger.isVegetarian():"+tiger.isVegetarian());

System.out.println("tiger.sound():"+tiger.sound());

System.out.println("giraffe.canClimb():"+giraffe.canClimb());

System.out.println("giraffe.isVegetarian():"+giraffe.isVegetarian());

System.out.println("giraffe.sound():"+giraffe.sound());

System.out.println("deer.canClimb():"+deer.canClimb());

System.out.println("deer.isVegetarian():"+deer.isVegetarian());

System.out.println("deer.sound():"+deer.sound());

System.out.println("monkey.canClimb():"+monkey.canClimb());

System.out.println("monkey.isVegetarian():"+monkey.isVegetarian());

System.out.println("monkey.sound():"+monkey.sound());

}

}

Lab Exercise 31:

/\*Create a class which displays the following about the JVM.

1. Version of Java

2. Vendor for Java

3. Class Path

4. Installed home directory

5. OS name on which it is installed with version

\*/

**package** com.hsbc.exercise31;

**import** java.util.Properties;

**public** **class** System {

**public** **static** **void** main(String[] args) {

Properties p = System.getProperties();

//JVM Properties

p.list(System.out);

}

}

Lab Exercise 32:

/\*Create a class called Student. Get the details like name, degree, age, total marks and

percentage from the user and display the same

\*/

package com.hsbc.exercise32;

import java.util.Scanner;

public class Student {

public static void main(String[] args) {

//Scanner class

Scanner sc = new Scanner(System.in);

System.out.println("Enter Student name:");

String name = sc.nextLine();

System.out.println("Enter Degree:");

String degree = sc.nextLine();

System.out.println("Enter Student age:");

int age = sc.nextInt();

System.out.println("Total Marks:");

int totalMarks = sc.nextInt();

System.out.println("Enter percentage:");

double percentage = sc.nextDouble();

System.out.println("Following are the student details:");

//Printing student details

System.out.println("\nName:"+name+"\nDegree:"+degree+"\nAge:"+age+"Total Marks:"+totalMarks+"\n"+"Percentage:"+percentage);

}

}

Lab Exercise 33:

Hall.java

**package** com.hsbc.exercise33.house;

**import** **static** java.lang.System.***out***;

**public** **class** Hall {

**public** **static** **void** main(String[] args) {

//Println without System

***out***.println("This is the first room while entering the house");

}

}

Kitchen.java

package com.hsbc.exercise33.house;

import static java.lang.System.\*;

import java.util.Arrays;

public class Kitchen {

public static void main(String[] args) {

//Variable array

String[] appliances = {"Oven","Grinder","Toaster","Mixer"};

String[] otherArr= new String[10];

for(int i=0;i<appliances.length;i++) {

out.println(appliances[i]);

otherArr[i] = appliances[i];

}

//Called garbage collector

gc();

}

}

Lab Exercise 50:

**package** com.hsbc.exercise50;

**import** java.util.Scanner;

//Class name

**public** **class** Calculator {

**double** result;

//Main method

**public** **static** **void** main(String[] args) {

Calculator calc = **new** Calculator(); //Object of class file

//Calling methods using object

calc.add();

calc.diff();

calc.mul();

calc.div();

}

//Methods declarations

//Add method using error handling

**private** **void** add() {

Scanner sc = **new** Scanner(System.***in***);

**try** {

System.***out***.println("Enter numbers for addition");

**double** a = sc.nextDouble();

**double** b = sc.nextDouble();

System.***out***.println("Addition is:"+(a+b));

}

**catch**(NumberFormatException n) {

n.printStackTrace();

}

}

**public** **void** diff() {

Scanner sc = **new** Scanner(System.***in***);

**try** {

System.***out***.println("Enter numbers for subtraction");

**double** a = sc.nextDouble();

**double** b = sc.nextDouble();

System.***out***.println("Subtraction is:"+(a-b));

}

**catch**(NumberFormatException n) {

n.printStackTrace();

}

}

**public** **void** mul() {

Scanner sc = **new** Scanner(System.***in***);

**try** {

System.***out***.println("Enter numbers for multiplication");

**double** a = sc.nextDouble();

**double** b = sc.nextDouble();

System.***out***.println("Multiplication is:"+(a\*b));

}

**catch**(NumberFormatException n) {

n.printStackTrace();

}

}

**public** **void** div() {

Scanner sc = **new** Scanner(System.***in***);

**try** {

System.***out***.println("Enter numbers for Division");

**int** a = sc.nextInt();

**int** b = sc.nextInt();

System.***out***.println("Division is:"+(a/b));

}

**catch**(ArithmeticException n) {

System.***out***.println("Divide by 0 not allowed");

}

}

}

Lab Exercise 51:

**package** com.hsbc.exercise51; //package name

**public** **class** StringClass { //Class name

//main method

**public** **static** **void** main(String[] args) {

//given string

///String str = "The quick brown fox jumps over the lazy dog";

String str = **null**;

**try** {

System.***out***.println("Character at 12th position is::"+str.charAt(12));

System.***out***.println("Checking the string contains word s::"+str.contains("s"));

System.***out***.println("Appending to string::"+str.concat(" and killed it"));

System.***out***.println("Checking if string ends with dog::"+str.endsWith("dog"));

System.***out***.println("Checking if string is equal to::"+str.equals("The quick brown Fox jumps over the lazy Dog"));

System.***out***.println("Checking if string is equal to::"+str.equals("THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG"));

System.***out***.println("Finding index position at char a::"+str.indexOf("a"));

System.***out***.println("Finding last index position at char e::"+str.lastIndexOf("e"));

System.***out***.println("Finding length of string::"+str.length());

System.***out***.println("Finding index position at char a::"+str.equals("The quick brown Fox jumps over the lazy Dog"));

System.***out***.println("Replacing The with A::"+str.replace("The", "A"));

**int** index = str.indexOf("jumps");

System.***out***.println("Splitting string::"+str.substring(0,index)+" , "+str.substring(index,str.length()));

StringBuilder sb = **new** StringBuilder();

**for** (String b : str.split(" ")) {

**if** (b.startsWith("f") || b.startsWith("d")) {

sb.append(b + "\n");

}

}

System.***out***.println("Animal names are::"+sb.toString());

System.***out***.println("String in lowercase::"+str.toLowerCase());

System.***out***.println("String in uppercase::"+str.toUpperCase());

}

**catch**(NullPointerException e) {

System.***out***.println("String is not initialised");

}

}

}

Lab Exercise 52:

**package** com.hsbc.exercise52; //package name

**public** **class** StringClass { //Class name

//main method

**public** **static** **void** main(String[] args) {

//given string

///String str = "The quick brown fox jumps over the lazy dog";

String str = "The quick";

**try** {

System.***out***.println("Character at 12th position is::"+str.charAt(12));

System.***out***.println("Checking the string contains word s::"+str.contains("s"));

System.***out***.println("Appending to string::"+str.concat(" and killed it"));

System.***out***.println("Checking if string ends with dog::"+str.endsWith("dog"));

System.***out***.println("Checking if string is equal to::"+str.equals("The quick brown Fox jumps over the lazy Dog"));

System.***out***.println("Checking if string is equal to::"+str.equals("THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG"));

System.***out***.println("Finding index position at char a::"+str.indexOf("a"));

System.***out***.println("Finding last index position at char e::"+str.lastIndexOf("e"));

System.***out***.println("Finding length of string::"+str.length());

System.***out***.println("Finding index position at char a::"+str.equals("The quick brown Fox jumps over the lazy Dog"));

System.***out***.println("Replacing The with A::"+str.replace("The", "A"));

**int** index = str.indexOf("jumps");

System.***out***.println("Splitting string::"+str.substring(0,index)+" , "+str.substring(index,str.length()));

StringBuilder sb = **new** StringBuilder();

**for** (String b : str.split(" ")) {

**if** (b.startsWith("f") || b.startsWith("d")) {

sb.append(b + "\n");

}

}

System.***out***.println("Animal names are::"+sb.toString());

System.***out***.println("String in lowercase::"+str.toLowerCase());

System.***out***.println("String in uppercase::"+str.toUpperCase());

}

**catch**(StringIndexOutOfBoundsException e) {

System.***out***.println("String index out of bounds");

}

}

}

Lab Exercise53:

//Program for square of elements of array

**package** com.hsbc.exercise53;

**public** **class** ArraySquares {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

//Defining matrix in array form

**int** m[][] = { { -1, 2, 3, 4 },

{ 5, 6, -7, 8 },

{ 9, 10, 11, 12 } };

System.***out***.println("Sum of squares of matrix is::");

**try** {

// Loop through all rows

**for** (**int** i = 0; i < m.length; i++)

{

// Loop through all elements of current row

**for** (**int** j = 0; j <= m[i].length; j++) {

System.***out***.print(m[i][j] \* m[i][j]+ " ");

}

System.***out***.println("\n");

}

}

**catch**(ArrayIndexOutOfBoundsException e) {

System.***out***.println("\nArray index out of bound exception.");

}

}

}

Lab Exercise 54:

/\*By using multiple catch blocks, write a class to demonstrate the order of the execution of the

catch blocks usingNegativeArraySizeException,ArrayIndexOutOfBoundsException,

StringIndexOutOfBoundsException, IndexOutOfBoundsException, NullPointerException,

ArithmeticException and print the stack trace for each exception.

\*/

package com.hsbc.exercise54;

public class DemoExceptions {

public static void main(String[] args) {

try {

int[] arr = new int[-12];

arr[12]=12;

}

catch (NegativeArraySizeException e) {

e.printStackTrace();

}

catch (ArrayIndexOutOfBoundsException e) {

e.printStackTrace();

}

catch (StringIndexOutOfBoundsException e) {

e.printStackTrace();

}

catch (IndexOutOfBoundsException e) {

e.printStackTrace();

}

catch (NullPointerException e) {

e.printStackTrace();

}

catch (ArithmeticException e) {

e.printStackTrace();

}

}

}

Lab Exercise 55:

Account.java

**package** com.hsbc.exercise55.bank;

**public** **interface** Account {

**public** **static** **final** String ***Savings*** = "";

**public** **static** **final** String ***Fixed*** = "";

**public** **static** **final** String ***PersonalLoan*** = "";

**public** **static** **final** String ***HousingLoan*** = "";

**public** **void** createAcc();

}

CreditInterest.java

**package** com.hsbc.exercise55.bank;

**public** **interface** CreditInterest {

**public** **double** addMonthlyInt();

**public** **double** addHalfYrlyInt();

**public** **double** addAnnualInt();

}

DebitInterest.java

**package** com.hsbc.exercise55.bank;

**public** **interface** DebitInterest {

**public** **double** deductMonthlyInt();

**public** **double** deductHalfYrlyInt();

**public** **double** deductAnnualInt();

}

DepositAcc.java

**package** com.hsbc.exercise55.bank;

**public** **interface** DepositAcc {

**public** **double** withdraw ();

**public** **double** deposit();

**public** **double** getBalance();

}

Interest.java

**package** com.hsbc.exercise55.bank;

**public** **interface** Interest {

**public** **static** **final** **double** ***intPercentageSavingAcc*** = 0;

**public** **static** **final** **double** ***intPercentageFixedAcc*** = 0;

**public** **static** **final** **double** ***intPercentagePersonalLoanAcc*** = 0;

**public** **static** **final** **double** ***intPercentageHousingLoanAcc*** = 0;

**public** **void** calcInt();

}

LoanAcc.java

**package** com.hsbc.exercise55.bank;

**public** **interface** LoanAcc {

**public** **double** repayPrincipal ();

**public** **double** payInterest ();

**public** **double** payPartialPrincipal ();

}

CustomException.java

**package** com.hsbc.exercise55.bankImpl;

**public** **class** CustomException **extends** Exception{

**public** **static** **void** main(String[] args) {

System.***out***.println("In Cutomexception class");

}

}

FDAcc.java

package com.hsbc.exercise55.bankImpl;

import com.hsbc.exercise55.bank.CreditInterest;

import com.hsbc.exercise55.bank.DepositAcc;

public class FDAcc implements CreditInterest, DepositAcc {

@Override

public double withdraw() {

return 34;

}

@Override

public double deposit() {

return 456;

}

@Override

public double getBalance() {

return 400;

}

@Override

public double addMonthlyInt() {

return 4.67;

}

@Override

public double addHalfYrlyInt() {

return 8.566;

}

@Override

public double addAnnualInt() {

return 12.46;

}

}

HousingLoanAcc.java

package com.hsbc.exercise55.bankImpl;

import com.hsbc.exercise55.bank.DebitInterest;

import com.hsbc.exercise55.bank.LoanAcc;

public class HousingLoanAcc implements DebitInterest, LoanAcc {

@Override

public double repayPrincipal() {

return 456450.567;

}

@Override

public double payInterest() {

return 45045.567;

}

@Override

public double payPartialPrincipal() {

return 45645.567;

}

@Override

public double deductMonthlyInt() {

return 945.567;

}

@Override

public double deductHalfYrlyInt() {

return 645.567;

}

@Override

public double deductAnnualInt() {

return 5645.567;

}

}

MyAccount.java

**package** com.hsbc.exercise55.bankImpl;

//Caller class

**public** **class** MyAccount **extends** CustomException{

//Main method

**public** **static** **void** main(String[] args) {

//Objects of different classes

SavingsAcc savingsAcc = **new** SavingsAcc();

FDAcc fdAcc = **new** FDAcc();

PersonalLoanAcc personalLoanAcc = **new** PersonalLoanAcc();

HousingLoanAcc housingLoanAcc = **new** HousingLoanAcc();

System.***out***.println("------------BANKING SYSTEM------------\n");

//For SavingAcc class

System.***out***.println("Annual interest earned on saving account is::"+savingsAcc.addAnnualInt());

System.***out***.println("Half yearly interest earned on saving account is::"+savingsAcc.addHalfYrlyInt());

System.***out***.println("Monthly interest earned on saving account is::"+savingsAcc.addMonthlyInt());

System.***out***.println("Total deposit on saving account is::"+savingsAcc.deposit());

System.***out***.println("Total Balance on saving account is::"+savingsAcc.getBalance()+"\n");

//For FDAcc class

System.***out***.println("Annual interest earned on FD account is::"+fdAcc.addAnnualInt());

System.***out***.println("Half yearly interest earned on FD account is::"+fdAcc.addHalfYrlyInt());

System.***out***.println("Monthly interest earned on FD account is::"+fdAcc.addMonthlyInt());

System.***out***.println("Total deposit on FD account is::"+fdAcc.deposit());

System.***out***.println("Total Balance on FD account is::"+fdAcc.getBalance()+"\n");

//For PersonalLoanAcc

System.***out***.println("Deducted Annual Interest on PersonalLoanAccount:"+personalLoanAcc.deductAnnualInt());

System.***out***.println("Deducted Annual Interest on PersonalLoanAccount:"+personalLoanAcc.deductHalfYrlyInt());

System.***out***.println("Deducted Annual Interest on PersonalLoanAccount:"+personalLoanAcc.deductMonthlyInt());

System.***out***.println("Interest Paybale on PersonalLoanAccount:"+personalLoanAcc.payInterest());

System.***out***.println("Partial Principal Payable on PersonalLoanAccount:"+personalLoanAcc.payPartialPrincipal());

System.***out***.println("Repay principal on PersonalLoanAccount:"+personalLoanAcc.repayPrincipal()+"\n");

//For HousingLoanAcc

System.***out***.println("Deducted Annual Interest on HousingLoanAccount:"+housingLoanAcc.deductAnnualInt());

System.***out***.println("Deducted Annual Interest on HousingLoanAccount:"+housingLoanAcc.deductHalfYrlyInt());

System.***out***.println("Deducted Annual Interest on HousingLoanAccount:"+housingLoanAcc.deductMonthlyInt());

System.***out***.println("Interest Paybale on HousingLoanAccount:"+housingLoanAcc.payInterest());

System.***out***.println("Partial Principal Payable on HousingLoanAccount:"+housingLoanAcc.payPartialPrincipal());

System.***out***.println("Repay principal on HousingLoanAccount:"+housingLoanAcc.repayPrincipal());

System.***out***.println("\n\nExit!");

}

}

PersonalLoanAcc.java

package com.hsbc.exercise55.bankImpl;

import com.hsbc.exercise55.bank.DebitInterest;

import com.hsbc.exercise55.bank.LoanAcc;

public class PersonalLoanAcc implements DebitInterest, LoanAcc {

@Override

public double repayPrincipal() {

return 45645.567;

}

@Override

public double payInterest() {

return 450.567;

}

@Override

public double payPartialPrincipal() {

return 4565.567;

}

@Override

public double deductMonthlyInt() {

return 45.567;

}

@Override

public double deductHalfYrlyInt() {

return 455.567;

}

@Override

public double deductAnnualInt() {

return 5645.567;

}

}

SavingsAcc.java

package com.hsbc.exercise55.bankImpl;

import com.hsbc.exercise55.bank.CreditInterest;

import com.hsbc.exercise55.bank.DepositAcc;

public class SavingsAcc implements DepositAcc, CreditInterest {

@Override

public double addMonthlyInt() {

return 4.12;

}

@Override

public double addHalfYrlyInt() {

return 8.45;

}

@Override

public double addAnnualInt() {

return 18.56;

}

@Override

public double withdraw() {

return 111;

}

@Override

public double deposit() {

return 160;

}

@Override

public double getBalance() {

return 400;

}

}

Lab Exercise 56:

**package** com.hsbc.exercise56;

**public** **class** Finally {

**static** Finally *f*;

**public** **static** **void** main(String[] args) {

**try** {

*f* = **new** Finally();

**int** div = 5 / 0;

*f*.disp(div);

}

**catch**(ArithmeticException e) {

e.printStackTrace();

}

**finally** {

*f* = **null**;

}

}

**void** disp(**int** div) {

System.***out***.println("In display property:"+div);

}

}

Lab Exercise57:

**package** com.hsbc.exercise57;

**public** **class** Sample {

**public** **static** **void** main(String[] args) {

System.***out***.println(*returnStr*());

}

//Calling static method

**static** String returnStr() {

String s = **null**;

**try** {

s = "Hi, this is Mike.";

**return** s;

}

**catch**(Exception e) {

s = s+ "value retured from exception";

**return** s;

}

**finally** {

s = s + "value returned from finally";

}

}

}

Lab Exercise58:

**package** com.hsbc.exercise58;

**import** java.util.Scanner;

//Custom exception class

**public** **class** Employee **extends** Exception{

**public** Employee(String str) {

System.***out***.println(str);

}

}

**class** NameException **extends** Exception{

**public** NameException(String str) {

System.***out***.println(str);

}

}

//Caller class

**class** Caller{

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

**try** {

String employee[] = **new** String[] {"ksp","rvg","aaaaaa"};

System.***out***.println("Enter employee name::");

String empName = sc.nextLine();

//Checking if employee already present

**for**(**int** i=0;i<employee.length;i++) {

**if**(empName.equals(employee[i])) {

//Throwing user defined exception class

**throw** **new** NameException("Duplicate employee names");

}

}

System.***out***.println("Employee name unique");

System.***out***.println("Enter your age");

**int** age = sc.nextInt();

**if**(age<18 || age>60) {

//Checking if invalid age

**throw** **new** Employee("Invalid age");

}

**else**

System.***out***.println("Valid age");

}

**catch**(Employee | NameException e) {

System.***out***.println(e);

}

}

}