Experiment No: 6

AIM: To implement packages and exception handling in JAVA application.

Date:

CO mapped: CO-3

Objectives:

> To effectively implement packages and exception handling in a Java application, organizing code into logical modules for improved maintainability, and ensuring robust error handling to enhance the application's reliability and user experience.

Background:

A java package is a group of similar types of classes, interfaces, and sub-packages. Package in java can be categorized in two forms, built-in package, and user-defined package. There are many built-in packages such as java, lang, awt, javax, swing, net, io, util, sql etc. Here, we will have the detailed learning of creating and using user-defined packages.

Exception Handling in Java is one of the powerful mechanisms to handle runtime errors so that the normal flow of the application can be maintained. In this practical, we will learn about Java exceptions, their types, and the difference between checked and unchecked exceptions.

Advantage of Java Package

1) Java package is used to categorize the classes and interfaces so that they can be easily maintained.
2) Java package provides access protection.
3) Java package removes naming collision.

Practical questions:

1. Write a program in Java to develop user defined exception for "Divide by Zero" error.
2. Write a program in Java to demonstrate throw, throws, finally, multiple try block and multiple catch exception.
3. Write a small application in Java to develop Banking Application in which user deposits the amount Rs 1000.00 and then start withdrawing ofRs 400.00, Rs 300.00 and it throws exception "Not Sufficient Fund" when user withdraws Rs 500 thereafter.
4. Write an application that contains a method named average () has one argument that is an array of strings. It converts these to double values and returns their average. The method generates a NullPointerException,if an array elements is null or a NumberFormatException, if an element is incorrectly formatted. Include throws statement in method declaration.
5. Write an application that generates custom exception if first argument from command line argument is 0.
6. A marklist containing reg.no and marks for a subject is given.if the marks are <0,user-defined IllegalMarkException is thrown out and handled with the message "Illegal

Mark". For all valid marks, the candidate will be declared as "PASS" if the marks are equal to or greater than 40, otherwise it will be declared as "FAIL".Write a class called IllegalMarkException.

7. Assume that there are two packages, student and exam. A student package contains Student class and the exam package contains Result class. Write a program that generates mark sheet for students.

8. Define a class A in package a pack. In class A, three variables are defined of access modifiers protected, private and public. Define class B in package bpack which extends A and write display method which accesses variables of class A. Define class C in package cpack which has one method display() in that create one object of class A and display its variables. Define class ProtectedDemo in package dpack in which write main() method. Create objects of class B and C and class display method for both these objects.

Observations: Put Output of the program

Conclusion: (Sufficient space to be provided)

Quiz: (Sufficient space to be provided for the answers)

1. Explain the benefits of organizing classes into packages in a Java application.
2. How do you declare and define a package in Java?
3. What is an exception in Java, and why is exception handling important in software development?
4. Explain the try-catch-finally block and its role in handling exceptions.
5. What is difference between throw and throws?

Suggested Reference:

1. https://www.tutorialspoint.com/java/
2. https://www.geeksforgeeks.org/
3. https://www.w3schools.com/java/
4. https://www.javatpoint.com/