PPT_JAVA_ASSIGNEMNT-5

Q.1 What is Exception in Java?

An exception is an event, which occurs during the execution of a program, that disrupts the normal flow of the program's instructions.

Exceptions occur for numerous reasons, including invalid user input, code errors, device failure, the loss of a network connection, insufficient memory to run an application, number divide b zero etc.

Q.2 What is Exception Handling?

The Exception Handling in Java is one of the powerful *mechanism to handle the runtime errors* so that the normal flow of the application can be maintained.

Exception: ClassNotFoundException, IOException, SQLException

Q.3 What is the difference between Checked and Unchecked Exceptions and Error?

1) **Checked Exception**
   The classes that directly inherit the Throwable class except RuntimeException and Error are known as checked exceptions. For example, IOException, SQLException, etc. Checked exceptions are checked at compile-time.
2) **Unchecked Exception**
   The classes that inherit the RuntimeException are known as unchecked exceptions. For example, ArithmeticException, NullPointerException, ArrayIndexOutOfBoundsException, etc. Unchecked exceptions are not checked at compile-time, but they are checked at runtime.
3) **Error**
   Error is irrecoverable. Some example of errors are OutOfMemoryError, VirtualMachineError, AssertionError etc.

Q4.What are the difference between throw and throws in Java?

throw:

*Java throw keyword is used throw an exception explicitly in the code, inside the function or the block of code.
*Using throw keyword, we can only propagate unchecked exception
*The throw keyword is followed by an instance of Exception to be thrown.
*throw is used within the method.
*We are allowed to throw only one exception at a time i.e. we cannot throw multiple exceptions.

throws:

*Java throws keyword is used in the method signature to declare an exception which might be thrown by the function while the execution of the code.
*Using throws keyword, we can declare both checked and unchecked exceptions.
*The throws keyword is followed by class names of Exceptions to be thrown.
*throws is used with the method signature.
*We can declare multiple exceptions using throws keyword that can be thrown by the method.

Q.5 What is multithreading in Java? mention its advantages

Multithreading allows the execution of multiple parts of a program at the same time.
These parts are referred to as threads, and they are lightweight processes that are available within the process. As a result, multithreading increases CPU utilization through multitasking. In multithreading, a computer may execute and process multiple tasks simultaneously.
A process is a running program, and a process can also be subdivided into independent units called threads.

Q.6 Write a program to create and call a custom exception.

```
class InvalidAgeException  extends Exception
{
public InvalidAgeException (String str)
{

super(str);
}
}


public class TestCustomException1
{
static void validate (int age) throws InvalidAgeException
{
if(age < 18)
{
new InvalidAgeException("age is not valid to vote"); }
else
{ System.out.println("welcome to vote");
}
}


public static void main(String args[])
{ try
{
validate(13);
}
catch (InvalidAgeException ex)
{
System.out.println("Caught the exception");
System.out.println("Exception occured: " + ex);
}
System.out.println("rest of the code...");
}
```

}

Q.7 How can you handle exceptions in Java?

The **Exception Handling in Java** is one of the powerful *mechanism to handle the runtime errors* so that the normal flow of the application can be maintained.

Java provides five keywords that are used to handle the exception. The following table describes each.

1.try

The "try" keyword is used to specify a block where we should place an exception code. It means we can't use try block alone. The try block must be followed by either catch or finally.

2.catch

The "catch" block is used to handle the exception. It must be preceded by try block which means we can't use catch block alone. It can be followed by finally block later.

3.finally

The "finally" block is used to execute the necessary code of the program. It is executed whether an exception is handled or not.

4.throw

The "throw" keyword is used to throw an exception.

5.throws

The "throws" keyword is used to declare exceptions. It specifies that there may occur an exception in the method. It doesn't throw an exception. It is always used with method signature.

Q.8 What is Thread in Java?

A **Thread** is a very light-weighted process, or we can say the smallest part of the process that allows a program to operate more efficiently by running multiple tasks simultaneously.

Q.9 What are the two ways of implementing thread in Java?

There are two ways to create a thread:

1. By extending Thread class

2. By implementing Runnable interface.

Q.10 What do you mean by garbage collection?

Garbage Collection is process of free the runtime unused memory automatically. In other words, it is a way to destroy the unused objects.

- It makes java **memory efficient** because garbage collector removes the unreferenced objects from heap memory.
- It is **automatically done** by the garbage collector(a part of JVM) so we don't need to make extra efforts.