Installation of required software's

1. Jdk 1.8
2. Eclipse (any version)
3. Sql Management Studio or any other DB(any version)
4. Tomcat (any version)
5. Servlet API jar (Depending on tomcat version) (servlet-api.jar)

JDBC jars as per database used (sqljdbc42.jar for SQLServer, mysql-connector-java-5.0.8-bin.jar for MySQL)

Setup

Links for installation (Eclipse): www.tutorialspoint.com/java/ (Environmental Setup) https://www.youtube.com/watch?v=bXs_ilhguH8
https://www.youtube.com/watch?v=kLgquZ2FiuQ

1. Setting classpath and path in environmental variables
2. Simple Java Project for Java assignment
3. Dynamic Web project for Web Application
4. Configure tomcat in eclipse

Things to be remembered while writing code

1. Give meaningful names. Follow the naming conventions.(https://www.javatpoint.com/java-naming-conventions)
   Class Name – Noun (Eg: Student.java, LoginController.java)
   Method Name – Verb-Noun pairs (Eg: getBalance)
   Variable Name – Meaningful Names (Eg: studentName, FILE_PATH for constants)
2. Avoid repetition of code.
3. A method or class should do only what it is meant to do.
4. There should be tradeoff between lines of code and complexity.
5. Divide a given problem into small logical entities
6. Add comments wherever required.

Assignment (Read and perform hands-on for below topics)

1. Core Java (refer tutorials point)

1. Basics of Java: Concept of Class, Object, State (instance variable) and Methods (behavior).
2. Basic Datatypes, variable types, Modifier types, Final keyword, Constructors
3. Loop control and decision making
4. Strings, Arrays
5. Inheritance, Overriding, Polymorphism, Abstraction, Encapsulation, Interfaces, Packages

6. Exception, Hierarchy of exception, Handling exceptions, Throw v/s throws
   https://www.tutorialspoint.com/java/java_exceptions.htm
7. Collection: List, Set and Map. Collection operations on primitives and custom object
   (Eg: For custom object Student having properties ID and Name)
   List<Student> , Set< Student > , Map<Student,Student>
   https://beginnersbook.com/java-collections-tutorials/
   7.1. Sort List of primitives and custom object created above. Hint: Comparable v/s Comparator
      Interface(https://www.geeksforgeeks.org/comparable-vs-comparator-in-java/)
8. Multithreading, Thread pool executor, volatile keyword, thread-safe with respect to instance, local
   variable, Method synchronized and block synchronized
9. JSON - https://beginnersbook.com/2015/04/json-tutorial/
10. XML - https://www.javatpoint.com/xml-tutorial
11. JDBC - https://www.tutorialspoint.com/jdbc/index.htm
12. File read write (https://www.geeksforgeeks.org/java)

2. DBMS (https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm)

1. Need for database
2. Basic Queries:

   Select, Distinct, Where, And & Or, Order By, Insert Into, Update, Delete
   Injection, Select Top, Like, Wildcards, In, Between, Aliases

   Joins, Inner Join, Left Join, Right Join, Full Join

   Union, Select Into, Insert Into Select, Create DB, Create Table, Constraints, Not Null,

   Unique
   Primary Key, Foreign Key, Check, Default, Create Index.

   Drop, Alter, Auto Increment, Views, Null Values, Group By,
   Having Functions, Null Functions
3. Callable statement , Prepared Statement, stored procedure
4. Concept of normalization

3. Client Side Programming

1. HTML
   HTML Forms

   HTML Form Elements
   HTML Input Types
   HTML Input Attributes
   https://developer.mozilla.org/en-US/docs/Web/Guide/HTML/HTML5

2. CSS : https://www.w3schools.com/Css/
   https://getbootstrap.com/docs/3.3/getting-started

3. Java Script – For validation:
   https://www.w3schools.com/jS/default.asp

https://www.tutorialspoint.com/es6/index.htm

4. Integrating client and server side (First Application)

1. Servlets, JSP and mapping servlets (web.xml or annotation)
   https://docs.oracle.com/javaee/6/tutorial/doc/gilik.html

2. Different http methods and status codes.
   http://www.restapitutorial.com/httpstatuscodes.html

3. Create a simple web application (dynamic web project in eclipse) which will display hello world. Add tomcat server to host the application. Familiarize with the structure of dynamic projects.

4. Create a simple web application with login and registration form using JSP and Servlet. On successful login it must welcome the user. If the user is new he/she needs to register. Add a logout button on welcome page. On logout, the user should be directed again to the login page. If user enters incorrect password a proper message should be displayed and login form must be displayed again.

5. The required validations are to be added using JavaScript

Note: Whenever any changes are made in project try to clean the project then build it (build can also be set to automatically build) and restart tomcat again if required. If changes are made in html/jsp or js no need to restart the server. Just save the file and refresh the project.

Debugging Error

1. Do proper exception handling to know where exactly the exception has occurred.
2. Check the console and problems to know the cause and understand the error.
3. Run the program in debug mode. Add debug points and check line by line execution of code and inspect the value as well.

Key	Description
F5	Executes the currently selected line and goes to the next line in your program. If the selected line is a method call the debugger steps into the associated code.
F6	F6 steps over the call, i.e. it executes a method without stepping into it in the debugger.
F7	F7 steps out to the caller of the currently executed method. This finishes the execution of the current method and returns to the caller of this method.
F8	F8 tells the Eclipse debugger to resume the execution of the program code until is reaches the next breakpoint or watchpoint.

4. How to debug - https://www.youtube.com/watch?v=9gAjIQc4bPU
5. Debugging Javascript through Chrome DevTools - https://developers.google.com/web/tools/chrome-devtools/javascript/

Shortcuts

1. Ctrl + Shift + F - Format the code
2. Ctrl + Shift + O -To add imports and remove the unused ones
3. F5 - To refresh the code
4. Ctrl + Space Bar -All possible methods.

References

1. Javatpoint and tutorial point for java
2. W3schools for DBMS, HTML, CSS, Java Script
3. JavatPoint for Servlets and JSP
4. SQL Server and Management Studio Installation: https://docs.microsoft.com/en-us/sql/database-engine/install-windows/install-sql-server-from-the-installation-wizard-setup?view=sql-server-2017 https://docs.microsoft.com/en-us/sql/ssms/tutorials/tutorial-sql-server-management-studio?view=sql-server-2017