061306T4CPM

COMPUTER PROGRAMMING LEVEL 6

ICT/OS/CP/CR/06/6/A

ICT/OS/CP/CR/06/6/B

Apply Object Oriented Programming Concepts Using JAVA

July/August 2025

TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL (TVET CDACC)

PRACTICAL ASSESSMENT

DURATION: THROUGHOUT THE UNIT TRAINING PERIOD

INSTRUCTIONS TO CANDIDATE:

1. You are required to develop a Java application for **AutoTrack** Vehicle Rental Company.

2. You have been provided with the following resources for the practical tasks:
    i. A computer installed with Windows 10 OS or higher
    ii. Java Development Kit (JDK) Installation Media
    iii. NetBeans, Eclipse or DrJava IDE
    iv. Flash disk /CD RW

PROJECT: AUTOTRACK VEHICLE RENTAL SYSTEM

AutoTrack Rentals, a mid-sized vehicle leasing company based in your region, is undergoing a digital transformation initiative. As part of their modernization strategy, they have commissioned the design and development of a System that digitizes their entire rental/hire workflow—from vehicle registration and client management to bookings and returns.

You have been tasked with designing and building a complete system that will help AutoTrack manage their daily operations with greater accuracy, traceability, and speed. The system will be used by company staff (admin role) and their walk-in or account-holding clients (customer role).

A customer can view available vehicles (e.g., cars, vans, motorcycles); View detailed information about each vehicle; register as a customer with personal details; make a vehicle booking for specific dates; return a vehicle and calculate total rental charges and also view past booking history (if stretch goal enabled by the Admin).

Alternatively, Admins can Add, update, or delete vehicle records in the system; View all current and past bookings; Mark vehicles as unavailable or under maintenance; Generate simple reports (e.g., most rented vehicle, overdue returns) and Register new customers (if needed). At any given time, a vehicle should not be booked more than once.

The application will be deployed in a controlled environment within the company’s offices and must allow multiple types of vehicles to be managed, booked, and returned by different users within defined periods.

Create a folder named with your ***AdmissionNumber*** to help you organize and store all your documentation files and screenshots. The documentation files (word or pdf documents) must contain a header that has your ***Admission_Number***, ***Student_Name*** and ***Institution_Name***.

TASK 1: Project Planning

a) Define project goals and target users
b) Identify system actors: Admin, Customer
c) Write a brief concept paper
d) List software tools, frameworks, and Java version

TASK 2: Design Specification & Environment Setup

a) Install the latest Java JDK and set up your preferred IDE (e.g., IntelliJ, Eclipse, VS Code)
b) Create a **Use Case Diagram** showing interactions between actors and the system

c) Draw a **UML Class Diagram** to represent your system structure
d) Prepare a simple **test plan** outlining what will be tested and how (per task)

TASK 3: Application Development

a) Create vehicle categories and manage their characteristics such as brand, model, capacity, and daily rate
b) Build a basic user interface (console or GUI) to allow customers to browse and book vehicles
c) Allow users to register with the system and log in
d) Record customer bookings, including duration and assigned vehicle
e) Implement a return feature that releases the vehicle and records return date
f) Track available and rented vehicles in real-time
g) Ensure the system detects and prevents invalid bookings (e.g., booking unavailable vehicles or entering invalid dates)
h) Maintain lists of users and transactions during runtime using appropriate data structures

TASK 4: Testing & Debugging

a) Perform Unit testing for critical functions (booking, returning, searching etc.)
b) Demonstrate and fix logical and compilation errors found during development
c) Use debugging tools or logs to validate application workflow

TASK 5: System Publication

a) Package the final project as a runnable application (e.g. Jar, Exe)
b) Write a step-by-step deployment guide with relevant screenshots
c) Propose a short real-world use case explaining how the system could be adopted by a rental company

TASK 6: Project Documentation

a) Submit complete source code, well-formatted and with inline comments
b) Include UML diagrams, screenshots, and testing results in the documentation
c) Provide a technical summary of how the system works from a user and admin perspective
d) Submit a well-organized digital folder containing source code, Jar/Exe file, Documentation (word or PDF) and Screenshots or supporting images