Low-Level Design Document (LLDD) — Xyz Employee Management System

## 1. Introduction

The Xyz Employee Management System models different categories of employees such as Full-time, Contractor, and Interns. The system supports operations like adding, removing, searching, and transitioning employees between statuses such as Active, Inactive, and Resigned

## 2. Core Entities (Classes & Interfaces)

The UML diagram defines several core entities:  
- XyzEmployee (Abstract Class): The base representation of an employee, capturing shared details like ID, name, gender, status, and dates.  
- XyzEmployee (Interface): Defines the common contract for all employee types, ensuring consistency in accessors and behaviors.  
- XyzFullTimeEmployee: Specialization of XyzEmployee that tracks leave entitlements.  
- XyzContractorEmployee: Represents contractor employees, linked to an external agency.  
- XyzInternEmployee: Represents interns with details about their college and branch.

## 3. Data Structures

The system uses a custom doubly-linked list (EDLL<T>) to store employees. Each node contains employee data and pointers to previous and next nodes. This choice gives flexibility for inserting/removing employees efficiently without relying on standard libraries.

## 4. Manager Class

The XyzEmployeeManager is the central orchestrator. It manages two lists:  
- Active/Inactive employees.  
- Resigned employees.  
It provides operations to add new employees, remove or resign existing ones, search employees by ID or name, and convert employees from one type to another (e.g., Contractor to Full-time).

## 5. Enumerations

Enumerations capture predefined categories in the system:  
- EmployeeStatus: Active, Inactive, Resigned.  
- EmployeeType: Full-time, Contractor, Intern.  
- ContractorAgency, InternCollege, InternBranch: Define organizational sources for contractors and interns.

## 6. Relationships in UML

The relationships between classes are as follows:  
- Inheritance: FullTime, Contractor, and Intern employees inherit from the abstract base XyzEmployee.  
- Interface Implementation: XyzEmployee implements IXyzEmployee to ensure a consistent contract.  
- Composition: XyzEmployeeManager uses EDLL to maintain employee collections.  
- Association: Employees are associated with enums for type, status, and categories like agency or college.

## 7. Behavioral Explanation

Typical system behaviors:  
- Adding an Employee: The manager creates or accepts an employee object and stores it in the active list.  
- Removing an Employee: An employee’s status changes to Resigned and is moved from the active list to the resigned list.  
- Searching: The manager can retrieve employees by ID or name.  
- Converting Type: For example, an intern can be converted into a full-time employee by creating a new object with the same attributes.