Interview Skills Preparation Document - Software Development Focus

Common Technical Interview Questions & Prepared Responses

1. "Tell me about yourself"

My Response:
"I'm a passionate Software Development student at CPUT with a solid foundation in programming, problem-solving, and software engineering principles. I've gained hands-on experience with Java, Python, and various web technologies through academic and personal projects. What excites me most about software development is building efficient, scalable solutions that address real-world problems. I'm especially drawn to roles that challenge me to grow as a developer while contributing to meaningful software projects."

2. "Why do you want to be a software developer?"

My Response:
"I'm fascinated by the problem-solving nature of software development. The ability to write code that solves practical problems and improves user experiences is incredibly fulfilling. During my time at CPUT, I've enjoyed the entire development lifecycle — from conceptualizing solutions to debugging and optimizing code. I see software development as both a creative and analytical field that allows continuous learning and innovation."

3. "What programming languages are you comfortable with?"

My Response:
"I have strong experience with the following languages and tools:

- **Java:** Object-oriented programming, data structures, and algorithms

- **Python:** Scripting, data analysis, and backend development

- **JavaScript/HTML/CSS:** Frontend web development

- **SQL:** Database design and querying

I'm also confident using **Git** for version control and have experience working within **Agile development environments**."

STAR Method Responses for Software Development

4. "Describe a challenging coding project you worked on"

Situation: For my final-year project at CPUT, I developed a **student management system** that needed to support multiple users, handle complex data relationships, and provide real-time updates.

Task: I had to design and implement a **full-stack web application** that was scalable, secure, and user-friendly, all within a strict **12-week deadline**.

Action: I implemented a **three-tier architecture** using React for the frontend, Spring Boot for the backend, and MySQL as the database. I built RESTful APIs, integrated user authentication, and designed responsive UI components. To manage performance issues, I optimized SQL queries and introduced caching. I followed the **Agile methodology** with weekly sprints and used **Git** for version control.

Result: The project was completed on time and received a **distinction**. It handled over **100 concurrent users** during testing, proving its reliability and scalability. This experience strengthened my full-stack development skills and project management capabilities.

5. "Tell me about a time you debugged a complex issue"

Situation: During a group project, our application was experiencing **random crashes in production** that we couldn't replicate in the development environment.

Task: My responsibility was to **identify the root cause** of these intermittent crashes and implement a **permanent fix**.

Action: I began by analysing server logs and found a pattern linked to memory usage. Using profiling tools, I discovered a **memory leak** caused by improper database connection handling. I implemented **connection pooling**, added robust error handling, and created **unit tests** to prevent future regressions.

Result: The crashes stopped completely, and application performance improved by **40%**. This experience taught me the importance of systematic debugging and effective resource management.

Technical Concepts I'm Prepared to Discuss

Object-Oriented Programming:

- Core principles: **Encapsulation, Inheritance, Polymorphism, Abstraction**

- Familiarity with design patterns such as **Singleton, Factory, and Observer**

- Strong understanding of **SOLID principles**

Database Knowledge:

- SQL query optimization

- Database normalization techniques

- Understanding of **ACID** properties

Development Practices:

- Practical experience with **Agile/Scrum** methodologies from CPUT projects

- Knowledge of **Test-Driven Development (TDD)**

- Proficiency with **Git workflows** and collaborative development

Questions I Prepare to Ask Technical Interviewers

About the Technical Environment:

- "What does your current tech stack look like, and are there plans to evolve it?"

- "How does your team manage technical debt and code reviews?"

- "Which version control and CI/CD practices do you use?"

About Development Processes:

- "Could you describe your development methodology (Agile, Scrum, etc.)?"

- "How does your team approach testing and quality assurance?"

- "What's the typical timeline from ideation to deployment?"

About Growth for Developers:

- "What opportunities are there for learning new technologies?"

- "How does the company support developers in attending training or conferences?"

- "What does the career growth path for software developers look like here?"

CPUT Projects I Can Discuss

Student Management System (Final Year Project)

- Full-stack web application

- **Technologies:** Java, Spring Boot, React, MySQL

- **Key Features:** User authentication, data management, reporting