# Technical Interview – Homework

## Interactive Interview Simulation with ChatGPT

Practice with a **simulated practical interview session** using **ChatGPT as an interactive technical interviewer**. Open ChatGPT (<https://chat.openai.com>) and enter the following **prompt**:

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| --- |
| **Interview Simulation Prompt for ChatGPT** |
| I am applying for “junior Java developer”. I want to train my interview skills. This is a technical interview with a recruiter. Act as a recruiter, but wait for my response, before you ask me the next question. After each answer I give you, give me feedback by rating my answer on the scale from 1 to 10, also tell me what is missing or incorrect in my answer before asking me the next question. |

This is how your **interactive interview session** may look like:

A screenshot of a chat

Description automatically generated with medium confidence

A screenshot of a computer

Description automatically generated with medium confidence

A screenshot of a computer

Description automatically generated with medium confidence

A screenshot of a computer

Description automatically generated with medium confidence

A screenshot of a computer screen

Description automatically generated with low confidence

A screenshot of a computer

Description automatically generated with medium confidence

A screenshot of a computer screen

Description automatically generated with medium confidence

A screenshot of a computer

Description automatically generated with medium confidence

A screenshot of a computer

Description automatically generated with medium confidence

## Answer Technical Interview Questions

You are given a couple of **job postings**. Your task is to **pick one of them** and **answer the sample technical interview questions** in the blank cells on the right side:

* [**Junior .NET Developer**](Junior-.NET-Developer-Job-Posting.pdf)
* [**Junior Java Developer**](file:///C:\SoftUni\COURSES\IT-Career-Boost\07.HR-Interview\Junior-Java-Developer-Job-Posting.pdf)
* [**Junior JavaScript Web Developer**](file:///C:\SoftUni\COURSES\IT-Career-Boost\07.HR-Interview\Junior-JavaScript-Web-Developer-Job-Posting.pdf)
* [**Junior Python Developer**](Junior-Python-Developer-Job-Posting.pdf)
* [**Junior QA Engineer**](file:///C:\SoftUni\COURSES\IT-Career-Boost\07.HR-Interview\Junior-QA-Engineer-Job-Posting.pdf)

### Junior .NET Developer – Interview Questions

Answer the following **sample interview questions** to prepare for a technical interview. When you need to write code, or draw something, feel free to use any tool for the purpose (for example Paint), afterwards insert your screenshots in the table below. Finally, upload the filled table with your answers in the course Web site.

|  |  |
| --- | --- |
| 1. Draw a **LinkedList**. How it works? |  |
| 2. Draw a **hash-table**. How it works? |  |
| 3. What is **quicksort**? How does it work? |  |
| 4. What is **bubble** **sort**? How does it work? |  |
| 5. Can you write a **function** that takes a string as input and returns the string with the first letter of each word capitalized? |  |
| 6. Can you write a **function** that takes two arrays as input and returns a new array containing the elements that are common to both arrays? |  |
| 7. Give me an example of **abstraction** in OOP. |  |
| 8. Can you explain how does **Liskov** **Substitution** work and give an example? |  |
| 9. Give me an example of **polymorphism** in OOP. |  |
| 10. Draw a **database schema** for a library management system. You have the following **entities**: Book with fields title, author, ISBN and checked out, Author with fields name, nationality and date of birth, Genre with fields name and description, Librarian with fields name, salary, and books given. Consider the relationships between these entities. |  |
| 11. Draw a **database schema** for an e-commerce website. You have the following **entities**: Customer with fields name, email and address, Order with fields order number, date and total price, Product with fields name, description price, and category, and Category with fields name and description. Consider the relationships between these entities and ensure that your schema can efficiently handle a large number of orders and products. |  |
| 12. How do you **join** two tables in SQL? How does “**outer join**” works? |  |
| 13. Given a table of employees with columns for employee ID, name, and salary, write a SQL query to **find the average salary** of employees at the company. |  |
| 14. How would you implement **authentication** in a server-side Web app in your favorite MVC framework? |  |
| 15. How do you send **email** from a Web app? Which **SMTP** server would you use? |  |
| 16. You are developing a web application for an e-commerce website. You have database with tables for products, customers, orders and order details. How would you implement a feature to allow customers to **place an order**? |  |
| 17. You are building a healthcare app. How would you implement a feature for doctors to **view** a patient’s medical records during an appointment, and allow doctors to **add** new information to the record? |  |
| 18. You are developing a hotel booking system. How would you implement a feature to **retrieve** all bookings for a particular **date range**? |  |
| 19. You are implementing a Web form in ASP.NET MVC. How would you add **validation**? |  |
| 20. You are building a social media app. How would you implement a feature to allow users to **post** messages, **view** other user’s post and **like** or **comment** on posts? |  |

### Junior Java Developer – Interview Questions

Answer the following **sample interview questions** to prepare for a technical interview. When you need to write code, or draw something, feel free to use any tool for the purpose (for example Paint), afterwards insert your screenshots in the table below. Finally, upload the filled table with your answers in the course Web site.

|  |  |
| --- | --- |
| 1. What is a **TreeSet**? How does it work? |  |
| 2. What is a **TreeMap**? How does it work? |  |
| 3. Can you find the **largest** number in an **unsorted** array? |  |
| 4. What is **bubble** **sort** and how does it work? |  |
| 5. What is **quicksort** sort and how does it work? |  |
| 6. What is **binary** **search** and how does it work? |  |
| 7. Can you write a Java program that takes a positive integer ‘n’ as input and prints the first ‘n’ **Fibonacci** numbers? |  |
| 8. Can you give me an example of the **single** **responsibility** principle? Why do we use it? |  |
| 9. Can you give me an example of **interface** **segregation** principle? Why do we use it? |  |
| 10. Can you draw a class **hierarchy** for vehicles which includes the following classes: Vehicle, Car, Truck, MotorCycle, Sedan, SUV, Sport Bike? |  |
| 11. Can you draw a class **hierarchy** with animals which includes the following classes: Animal, Predator, Mammal, Cat, Lion, Tiger, Non-Predator, Elephant, Bird, Giraffe, Birds of Prey, Macaw, Hawk, Parrot, Falcon? |  |
| 12. You are building a system to hold documents in different file formats (e.g. PDF, MS Word, Excel). **Draw** an **object-oriented hierarchy** to represent the documents. |  |
| 13. How would you **update** the email addresses of all customers which username starts with the letter ‘A’ in MySQL? |  |
| 14. How would you find in MySQL the **top 10** customers who have made the **most** orders in the last month? |  |
| 15. How would you **join** two tables together to **retrieve** a list of all employees and their associated departments, **sorted** by department name in MySQL? |  |
| 16. You are developing a Spring MVC app for a car dealership. You have already implemented the “Add Car” functionality. How would you implement a feature that allows a user to **view** all the cars in the dealership that have mileage of **less than 50,000 miles**? |  |
| 17. You are developing a Spring Boot app for a library. You have a database, ORM, and Spring Security set up. How would you implement a feature that allows a user to **check out** a book? Make sure that only **authenticated** users can access this feature. |  |
| 18. You are developing a Spring MVC app for an e-commerce website. You have a database, ORM, and Spring Security set up. How would you implement a feature that allows a user to **view their order history**? Make sure that only **authenticated** users can access this feature. |  |
| 19. You are developing a Spring-based web application that allows users to create and manage their personal to-do lists. You have already implemented the basic CRUD operations for the to-do list items using **RESTful** API endpoints. Now you need to **add** a feature that allows users to **mark** an item as completed. How would you implement this functionality using Spring? |  |
| 20. You are developing a RESTful API for a fitness tracking application using Java + Spring. Users should be able to track their progress by **logging** their exercise sessions. Each exercise session consists of multiple exercises, each with a name, description, and duration. How would you **design** the data model and implement the API endpoints for this feature using Spring? |  |

### Junior JavaScript Web Developer – Interview Questions

Answer the following **sample interview questions** to prepare for a technical interview. When you need to write code, or draw something, feel free to use any tool for the purpose (for example Paint), afterwards insert your screenshots in the table below. Finally, upload the filled table with your answers in the course Web site.

|  |  |
| --- | --- |
| 1. What is **a Priority Queue**? How does it work? |  |
| 2. What is a **Tree**? How does it work? |  |
| 3. What is a **Stack**? How does it work? |  |
| 4. What is **merge-sort**? How does it work? |  |
| 5. What is **dynamic programming**? Can you give an example? |  |
| 6. What is **binary search**? Can you give an example? |  |
| 7. Give me an example of **polymorphism** in OOP. |  |
| 8. Give me an example of **encapsulation** in OOP. Why do we use it? |  |
| 9. Give me an example of **inheritance** in OOP. Why do we use it? |  |
| 10. Draw a database **diagram** to hold a library of documents. Each document has multiple categories and has different format (PDF, MS Word, Excel, other). |  |
| 11. You are designing a system to represent a library of books, magazines, and newspapers. Draw an **object-oriented hierarchy** to represent the library. |  |
| 12. You are developing a game that has different types of characters such as warriors, wizards, and archers. Draw **an object-oriented hierarchy** to represent the characters. |  |
| 13. You have a database holding customers and orders. Write a SQL query to find all customers who have made more than **3** orders in the past **month**. |  |
| 14. How do you **join** two tables in SQL? How does “**outer join**”works? |  |
| 15. You want to create a **responsive** image gallery with **pagination**, which allows users to browse through a large set of images. How would you implement this using HTML, CSS, and JavaScript? |  |
| 16. How do you send **email** from a Web App? Which **SMTP** server would you use? |  |
| 17. Can you describe the differences between **cookies** and **sessions** in web development, and provide examples of when each would be most appropriate to use? |  |
| 18. Can you explain the concept of cross-site scripting (XSS), and describe how you would prevent **XSS attack** in a web application? |  |
| 19. How would you implement a simple chat Web app? Describe its main **components** and their **interactions**. |  |
| 20. You want to build a simple front-end app, which collects a few **form** fields and sends them to the **server** side. Explain how you could implement it technically? |  |

### Junior Python Developer – Interview Questions

Answer the following **sample interview questions** to prepare for a technical interview. When you need to write code, or draw something, feel free to use any tool for the purpose (for example Paint), afterwards insert your screenshots in the table below. Finally, upload the filled table with your answers in the course Web site.

|  |  |
| --- | --- |
| 1. What is a **set**? How does it work? |  |
| 2. What is a **tuple**? How does it work? |  |
| 3. Write a **function** that takes a list of integers and returns a new list where each element is the sum of the corresponding elements of two input lists. |  |
| 4. Can you tell me what is **binary search** and how does it work? |  |
| 5. What is “**list**”? How does it work? |  |
| 6. Write a function that takes a string and returns True if the string is **palindrome**, and false otherwise. |  |
| 7. Can you write a **function** that takes a string and returns the number of vowels in the string? |  |
| 8. Can you tell me what is a **polymorphism**? Give me an example. |  |
| 9. What is **encapsulation**? Give me an example. |  |
| 10. You are building a system to manage a company's employee hierarchy. Each employee has a name, job title, and salary. The company has different departments such as IT, Marketing, and Sales. Draw **an object-oriented hierarchy** to represent the employees and departments. |  |
| 11. Can you write a query to find the **total** number of orders for **each** customer in the Orders table? |  |
| 12. Can you write a query to find the **top** **5** highest paid employees in the Employees table? |  |
| 13.How does **inner** join work? Can you provide example? |  |
| 14. Your web app has a form for users to submit their contact information. How would you use an MVC framework to handle form submissions and **save** it to a database? |  |
| 15. How would you create a RESTful API using Django to allow users to **retrieve** and **manipulate** data from a database? |  |
| 16. You are building a web app that allows users to create and **edit** their profiles. How would you use an MVC framework to handle user requests to **view**, **update**, or **delete** their profile information? |  |
| 17. You are building an e-commerce website that sells different types of products such as clothing, electronics, and home appliances. Draw an **object-oriented hierarchy** to represent the products. |  |
| 18. You need to implement client-side form validation in JavaScript? How would you ensure that form data is **valid** before submitting it to the server? |  |
| 19. How would you implement a simple web form using Flask to **accept user input** and **store** **it** in a database? |  |
| 20. How would you implement user **authentication** using Django to **restrict** access to certain pages or functionality on your web application? |  |

### Junior QA Engineer – Interview Questions

Answer the following **sample interview questions** to prepare for a technical interview. When you need to write code, or draw something, feel free to use any tool for the purpose (for example Paint), afterwards insert your screenshots in the table below. Finally, upload the filled table with your answers in the course Web site.

|  |  |
| --- | --- |
| 1. How would you **test a login form** in a mobile app? |  |
| 2. What happens when you **find a bug** during the testing process? |  |
| 3. What is **functional testing**? Give me an example. |  |
| 4. What is **non-functional testing**? Give me an example. |  |
| 5. What is **regression testing**? Give me an example. |  |
| 6. Can you draw the typical **software development life cycle** (SDLC)? Where the QA stays within it? |  |
| 7. What is the typical **bug lifecycle**? What are the different **states of a bug**? |  |
| 8. Your team develops a **web-based project management tool** where users can create tasks, assign them to team members, and track progress. As a QA, you need to test the "Create task" functionality. **What tests shall you design**? |  |
| 9. Your team develops a **mobile app** that allows users to create and edit notes. As a QA, you need to test the "Delete note" functionality. **What tests shall you design**? |  |
| 10. You are given a **mobile app** and you need to **test it for UI issues** on all major mobile platforms. You don’t have the required physical devices. How would you proceed? |  |
| 11. Suppose you are tasked with performing **smoke testing** on a new e-commerce website. What shall you test? Be sure to include the major components under testing, as well as any other systems or processes that would need to be involved. |  |
| 12. You are given a **RESTful Web API** for an image generation app (register, login, generate image by description). How would you test it? Which tools shall you use? |  |
| 13. Do you have experience with **automated testing tools**? What tools do you have experience with? Given me an example. |  |
| 14. How would you write **unit tests** to check if given sorting algorithm works as expected? |  |
| 15. You are given a **back-end Web application**. You are assigned to write an **integration test** for the “user registration” functionality. How would you proceed? |  |
| 16. You are given a **back-end Web application**. You are assigned to write an **end-to-end UI automated tests** for the “user login” functionality. How would you proceed? |  |
| 17. You are given a simple voting **mobile app**. You are assigned to write **automated UI tests** for the “view voting results” functionality. How would you proceed? |  |
| 18. You are given a Web app, which is deployed in a cloud environment. You need to **test it for performance** to ensure it can serve at least 1000 concurrent users. What tools shall you use and how? |  |
| 19. You have a Web-based e-commerce app. How would you perform **security testing** to ensure it is resistant to attacks? What kind of attacks will you look for? |  |
| 20. How would you **automate the testing** a of highly dynamic Web application, which changes it’s UI when you move the mouse over it? |  |