


National University of Computer and Emerging Sciences, Lahore Campus

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	Section:	5A & 5B	Page(s):	11
	Exam Type:	Finals - Retake		

Student : Name: _____ Roll No. _____ Section: _____

Instruction/Notes:

Attempt all questions on the question paper. Answer sheets are not required.
Take Assumptions where required and note them down along with your answers.

Read the following requirements and answer Question 1 & 2 based on these requirements

You are asked to enhance the search feature of an e-commerce platform. Currently, that platform only has one search field in the header. The user can enter any string that search field and click on the search button. The application then shows the products that have a complete match for the word(s) entered. You are now asked to add following features:

1. **Advanced search:** The software should allow users to perform advanced searches using multiple criteria, such as colours, sizes, brands, product category, price range.
2. **Fuzzy search:** The software should be able to handle approximate search matches. For example, if a user makes a typo, the system should return the result that is the closest match.
3. **Search suggestion:** The software should provide suggestions for search queries based on the user's past search history or popular queries (similar to search suggestions dropdown that appears in google search field).
4. **Search history:** The software should keep track of the user's search history and provide the capability to view, edit, and clear it.
5. **Boolean search:** The software should support boolean operators (AND, OR, NOT) in search queries to improve precision and recall e.g. "Blue shirt NOT faded" should show all blue shirts that does not have faded color patterns in them
6. **Search Result pagination:** The software should be able to handle a large number of search results and divide it into pages for easy navigation.
7. **Auto-complete:** The software should provide an auto-complete feature for search queries that suggests words and phrases as the user types.
8. **Search result highlight:** The software should be able to highlight the searched keywords in the search result.

You and your team realizes that this text-based search functionality is similar in many different products including some other e-commerce platforms, document management software, learning management softwares, etc. The main difference is typically the data, and categories for advance search. Also, some may require features like auto-complete some may not.

Question #1:[10 + 10]

- a) Suggest an architecture pattern that will be best suitable for this application so that your application can be used across different products. Also, give detailed requirements to make the product extendible.

- b) Identify 5 critical matrices that can be used to measure performance of this search application. Write down non-functional requirements for these 5 matrices using any hypothetical values. Write, few technical requirements on how to achieve those.

Question #2:[10+10+5]

- a) Create Different equivalence classes and boundary values for
 - i) **Section 6: Search Result Pagination**
 - ii) **Section 7: Auto-complete**

Clearly state your assumptions before writing the equivalence classes and boundary values

- b) Create 10 unique test scenarios for 5th section i.e. **Boolean Search**.

- c) Identify test Data that you would need prior to executing the above 10 test scenarios

Question #3:[10 + 10]

You are required to automate the API Testing of the following endpoint of the Gitlab API.

GET /projects/:id/pipelines/:pipeline_id/jobs

This endpoint will return a list of all jobs in a pipeline with ***:pipeline_id*** for a project with ***:id***.

Url parameters have following rules:

- ***:id***
 - Is required and therefore will return a warning if not provided
 - Should be a valid id for a project that exists. If a project with ID does not exist then it should return a warning message
 - User should have the permission to access to the project
 - ***:pipeline_id***
 - Is required and therefore will return a warning if not provided
 - Should be a valid pipeline id for that specific project provided in above parameter. If a pipeline with that pipeline id does not exist in that project then it should return a warning message
 - User should have the permission to access to the pipelines of that project
- a) Write Gherkin test cases using scenario outlines to test the invalid cases of the above parameters where the api returns error messages.

- b) Write API test automation scripts using your preferred api test automation framework for the above test cases

Question #4:[5 + 5 + 5 + 5]

- a) Describe the importance of customer involvement and how customer input can be used to improve software quality.
- b) Describe the importance of leadership role and how leadership can influence the software quality

c) Explain the benefits and limitations of using synthetic data and production data as test data

d) List down quality attributes of a software as defined in ISO 25010