CodeQuest ⌨

Group 2 Members: Mion Fujie, Matthew En, Liz Halpern, Zaida Le
Manager: Anushka

CS 320 - Software Metrics

Creating User Account:

Information Domain Value	Points	Count	Simple	Average	Complex	Total

External Inputs	- Provide user information
	   - Username
	   - Email
	   - Password
	   - Opt for the user to be emailed for notifications
	   - Enable dark mode
	- Create user button
		2	4	1	0	5

External Outputs	- Error message - This email address is associated with another account - Confirmation email - The user was directed to the home page of CodeQuest	3	1	2	0	3
External Inquiries	- Check if the email is already associated with an account	1	1	0	0	1
Internal Logical Files	- The user's profile information is stored in a database table	1	1	0	0	1
External Interface Files	- Authentication via third-party services	1	0	0	1	1

Total		8	7	3	1	11

- Internal Logical File (ILF): User-identifiable group of related data maintained within the application.
  - All of the user's information provided in the form is sent to the database.
- External Interface File (EIF): User-identifiable group of related data referenced by the application but maintained within another application.
  - Users choose to sign in through third-party applications such as Google, Discord, or GitHub.
- External Input (EI): Unique elementary process that processes data coming from outside the application boundary.
  - User profile information such as user name, email, password, and enabling notifications via email/dark mode are used as inputs for creating the account.
  - The button is used to confirm and store all information in the database.
- External Output (EO): Unique elementary process that sends data outside the application boundary. Calculations, derivation of data, or maintenance also take place.
  - A confirmation email is sent to the user that an account has been created with CodeQuest.
  - Error message:
    - The user has already created an account with the email provided in the form. Advises users to provide new email as CodeQuest can not make another account with the same email.
  - After the button for creating the account is pressed, the user will be directed to the main page of CodeQuest.
- External Inquiry (EQ): Unique elementary process that sends data outside the application boundary. Calculations, derivation of data, or maintenance do not take place.
  - Check if the email is already associated with an account through a query to the database.

User Authentication:

Information Domain Value	Points	Count	Simple	Average	Complex	Total
External Inputs	- Input fields - Email	4	2	2	3	7

	- Password
	- Third-party OAuth
	    - Google
	    - Github
	    - Discord
	- Password Reset Request
	- Sign-in button					

External Outputs	- Messages to user
	    - Login success message
	    - Login failure message
	- Password reset
	- Access token for OAuth
		3	4	2	1	5

External Inquiries	- Validate OAuth token	1	0	0	1	1
Internal Logical Files	- User's account information in the database	1	0	1	1	2
External Interface Files	- OAuth with third-party authentication services	1	0	0	1	1
Total		10	6	5	7	16

- Internal Logical File (ILF): User-identifiable group of related data maintained within the application.
  - Check if the associated email with the password is valid.
- External Interface File (EIF): User-identifiable group of related data referenced by the application but maintained within another application.
  - If a user signs in with third-party authentication through OAuth, CodeQuest redirects for OAuth authentication.
- External Input (EI): Unique elementary process that processes data coming from outside the application boundary.
  - User inputs
    - User's email
    - User's Password
  - Three buttons dedicated to OAuth third-party authentication
    - Google
    - Github
    - Discord

- ○ Sign-button, to initiate external outputs.
- ● External Output (EO): Unique elementary process that sends data outside the application boundary. Calculations, derivation of data, or maintenance also take place.
  - ○ Messages to users:
    - ■ Login is a success: The user signed in with the correct email and associated password.
    - ■ Login failure:
      - ● Email is not associated with an account
      - ● Password Incorrect
      - ● Verification required for account
    - ■ Password reset:
      - ● Password reset takes the user to another form for the user to complete.
- ● External Inquiry (EQ): Unique elementary process that sends data outside the application boundary. Calculations, derivation of data, or maintenance do not take place.
  - ○ Users have to validate the OAuth token with a third-party application if using either Google, Discord, or GitHub.

Viewing Curriculum as a Graph

Information Domain Value	Points	Count	Simple	Average	Complex	Total
External Inputs		0	0	0	0	0
External Outputs	- Error Message - User clicked on locked content	0	1	0	0	4
External Inquiries		0	0	0	0	0
Internal Logical Files	- User data - Content data - User Content Progress	3	2	1	0	24
External Interface Files		0	0	0	0	0

		3	2	1	0	28
Total		3	2	1	0	28

Internal Logical File (ILF): check for user data and user content progress to validate starting position in graph, and to validate what content is locked to the user

External Interface File (EIF): There is not external interface file

External Input (EI): There is no external input since there is no action for the user

External Output (EO): an error message is displayed to the user notifying that the content is locked if user clicks on a lesson that has not yet been unlocked.

External Inquiry (EQ): There is no external inquiry since there is no action for the user

Consume Non - Interactive DSA Educational Content (Module 1)

Information Domain Value	Points	Count	Simple	Average	Complex	Total
External Inputs		0	0	0	0	0
External Outputs		0	0	0	0	0
External Inquiries		0	0	0	0	0
Internal Logical Files	- User data - User Progress Data	2	1	1	0	17
External Interface Files	- Content Data	1	1	0	0	5
Total		3	2	1	0	22

Internal Logical File (ILF): check user data and progress data to ensure access to course content

External Interface File (EIF): Load content data for the specific module

External Input (EI): There is no external input since there is no action for the user

External Output (EO): There is no external output since there is no action for the user

External Inquiry (EQ): There is no external inquiry since there is no action for the user

Non-Interactive Multiple Choice Questions pertaining to lesson content (Module 1)

Information Domain Value	Points	Count	Simple	Average	Complex	Total
External Inputs	- Answers to Multiple Choice Questions	1	1	0	0	3
External Outputs	- Result of Multiple Choice Questions (pass or fail)	1	0	1	0	5
External Inquiries	- Updating user's content progress data	1	1	0	0	3
Internal Logical Files	- User data - Content Progress Data	2	1	1	0	17
External Interface Files	- Content Data	1	1	0	0	5
Total		6	4	2	0	33

Internal Logical File (ILF): If the user's answers are checked to be correct
External Interface File (EIF): The content data is loaded in once the user enters the module
External Input (EI): the user inputs answers for each multiple choice question
External Output (EO): the user's answers to the multiple choice questions get checked for correctness, if not all correct the next module stays locked
External Inquiry (EQ): , the content progress data is updated and the user is prompted to the next module if the user's answers are correct

Daily Practice Reminders Through Email

Information Domain Value	Points	Count	Simple	Average	Complex	Total
External Inputs		0	0	0	0	0
External Outputs	- Email notification sent to the user	1	0	1	0	1

External Inquiries	- User profile changes to preferences of email notifications	1	0	1	0	1
Internal Logical Files	- User data name and email from the database	1	1	0	0	1
External Interface Files	- ActionMailer to send notifications to users	1	0	1	0	1
Total		4	1	3	0	4

- Internal Logical File (ILF): User-identifiable group of related data maintained within the application.
    - Take user data from the database to add to the notification email.
    - Take user email from the database to send notifications to.
- External Interface File (EIF): User-identifiable group of related data referenced by the application but maintained within another application.
    - ActionMailer is the Ruby on Rails tool used to send notifications to users via email.
- External Input (EI): Unique elementary process that processes data outside the application boundary.
    - There are no external inputs, as profile settings adjust the option to opt into an email.
- External Output (EO): Unique elementary process that sends data outside the application boundary. Calculations, derivation of data, or maintenance also take place.
    - An email gets sent from CodeQuest to the user.
- External Inquiry (EQ): Unique elementary process that sends data outside the application boundary. Calculations, derivation of data, or maintenance do not take place.
    - The user chooses to adjust whether or not to opt into email through the profile page.

View Profile of Users

Information Domain Value	Points	Count	Simple	Average	Complex	Total

External Inputs	- Logging in - Clicking Profile	1	1	0	0	1
External Outputs	- Display of user info, questions, solutions, exercises	3	0	3	0	3
External Inquiries	- Query for user profile, questions, solutions, exercises	3	0	3	0	3
Internal Logical Files	- User profile data, solutions, exercises	2	0	2	0	2
External Interface Files	- Third-party authentication services	1	1	0	0	1
Total		10	2	8	0	10

External Input (EI):
User logs in and clicks the "Profile button to access their own or another user's profile
External Output (EO):
- Display of user profile information (username, bio, etc.)
- Display of questions and solutions submitted by user or viewed on other profiles
- Display of exercises completed by the user
External Inquiry (EQ):
- Querying the database to retrieve user profile details
- Querying questions and solutions submitted by the user or others
- Querying exercises completed by the user
Internal Logical Files:
- User profile data stored in database
    - Name
    - Bio
    - Etc.
- Solutions and exercises completed by user
    - Stored in database table
External Interface Files (EIF):
- Third-party authentication services
    - When users log in via Google, GitHub, etc.

View Module 3 Exercises

Information Domain Value	Points	Count	Simple	Average	Complex	Total
External Inputs	- Logging in, choosing to view Module 3 exercises	1	1	0	0	1
External Outputs	- Display available exercises	3	0	3	0	3
External Inquiries	- Query to check if Module 2 is complete, query to retrieve exercises	2	2	0	0	2
Internal Logical Files	- User completion status, Module 3 exercises	3	0	3	0	3
External Interface Files	- N/A	1	1	0	0	1
Total		11	4	6	0	10

External Input (EI):
- User logs in and has completed Module 2
- User decides to view Module three exercises

External Output (EO):
- Display of available crowdsourced exercises for Module 3

External Inquiry (EQ):
- Querying database to check if use completed Module 2
- Querying database to retrieve Module 3 exercises

Internal Logical Files:
- Database storing user completion status of exercises
    - Module tracking system TBD
- Database storing Module 3 crowdsourced exercises

External Interface Files (EIF):
- N/A

Submit a Solution to an Exercise
- *External Inputs:*
  - Web Form Submission – MEDIUM
- *External Outputs:*
  - None.
- *External Inquiries:*
  - Submit the solution with the corresponding exercise to Judge0 for execution and judging – COMPLEX
- *Internal Logical Files:*
  - Exercises database and ActiveRecord model – MEDIUM
- *External Interface Files:*
  - None
- *Total*
  - **3**

Creating a new interactive programming exercise (Module 3)
- *External Inputs:*
  - Web Form Submission – MEDIUM
- *External Outputs:*
  - None.
- *External Inquiries:*
  - Validation through Judge0: Provided test cases pass for the provided solution COMPLEX.
- *Internal Logical Files:*
  - Exercises database table and ActiveRecord model – MEDIUM
- *External Interface Files:*
  - None.
- *Total*
  - 3

Adding a solution in a new language to an existing interactive programming exercise.
- *External Inputs:*
  - Web Form Submission – SIMPLE
- *External Outputs:*
  - Application flash message - SIMPLE
- *External Inquiries:*
  - Submit solution in a new language to Judge0, check the validity of solution - MEDIUM
- *Internal Logical Files:*
  - Exercises database table and ActiveRecord model - SIMPLE
- *External Interface files:*

Removing a Solution to an Interactive Programming Exercise/Removing an Exercise

Information Domain Value	Points	Count	Simple	Average	Complex	Total
External Inputs	- Identifying and clicking to remove a solution or exercise	1	1	0	0	1
External Outputs	- Notification of solution/exercise removal	2	2	0	0	2
External Inquiries	- Query to find the solution, query to check for valid remaining solutions	3	0	3	0	3
Internal Logical Files	- Solutions and exercises, admin actions	3	0	3	0	3
External Interface Files	- N/A	1	1	0	0	1
Total		10	4	6	0	10

External Input (EI):
- Admin identifies a faulty solution
- User clicks to remove a faulty solution or exercise

External Output (EO):
- Notification to system or users that solution or exercises has been removed

External Inquiry (EQ):
- Querying the database to find the solution/exercise flagged for removal
- Querying to check if other valid solutions exist before deleting an exercise

Internal Logical Files:
- Database storing solutions and exercise
- Database logging admin actions, such as solution removals

External Interface Files (EIF):

- N/A
  -