Programming Analogies

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Description of Users and Environment

- Environment
  - System that will clarify computer science topics through meaningful, real-world analogies
- Primary Users
  - Professors/High School teachers/Teacher Assistants
    - Translate knowledge to analogies to explain principles
    - Provide clarity and engagement with students
  - Administrators
    - Manage the application
- Secondary Users
  - Students who need clarification regarding a topic (view only, no creating analogies)
    - Ranging from high school to third & fourth-year university students
  - Scientist (Dr. Briana Bettin)

Use Scenario 1: Creating an Analogy

Use Scenario Personas

Persona 1: Dr. Douglas Brockmeier (Instructor)

38 years old, Ph.D. in Computer Science

Dr. Brockmeier is a favorite professor of first and second-year computer science students, and he is the only instructor at his university that teaches Introduction to Programming I, which teaches students C++. His Introduction to Programming course is always over 200 students and he's noticed that there are some concepts that a majority of students struggle with. He is looking for a way to communicate these concepts more effectively to students, but he doesn't have a lot of time to spend trying to come up with new ideas on his own.

Persona 2: Stewie (Student)

17 years old, First-year computer engineering student

Stewie is an avid reader and really enjoys blogging. He writes articles about technology and its applications and frequently tweets about the same. Stewie has some experience with programming since he likes mathematics and hopes to learn more about the underlying concepts and enhance his programming skills.

Use Scenario Description

- Dr. Brockmeier receives feedback from Stewie about their understanding of a topic
    - Misconceptions = Create an analogy
- Login to their account, and be redirected to the home page.
- Dr. Brockmeier chooses to create a new analogy by clicking button
    - Prompted to enter this information:
        - Misconception
        - Desired knowledge,
        - Source Domain and Target Domain
            - Domain, Precondition, Required action, Postcondition, Constraints
- Able to click the submit button if all fields are filled
- Help information popup to provide assistance with entering specific fields
- The analogy can now be given to Stewie to help their understanding

Use Scenario 2: Searching for Analogies

Use Scenario Description

- Stewie enters his query into the search bar
  - Query is specific to the concept needing clarification
- System will reference database based on query
- System returns “matches” to query based on similarities in database
- The return will be formatted to show highly visited and highly rated analogies
  - Stewie is now able to view analogies based on his results

Use Scenario 3: Deleting Analogies

Administrator description

Persona 3: Dr. Brian Bettib (Admin)

Ph.D. in Computer Science

Dr. Bettib is an admin for the application. She's technologically savvy and literate in database management. She ensures that authorized users and appropriate analogies are present on the application.

Use Scenario Description

- Dr. Bettib finds a poorly-organized analogy/inappropriate analogy
- Dr. Bettib selects the analogy by clicking on it
    - Elevated privileges will display a delete button at the bottom of the screen
- Upon clicking the delete button, system will prompt for a confirmation
    - User clicks confirmation button and system will delete the analogy.
- System will delete the analogy from the database
    - Success/Error will be displayed when system responds

Use Scenario 4 & 5:
Errors creating an Analogy

Use Scenario Description

Use Scenario 4: Creating analogy with missing fields

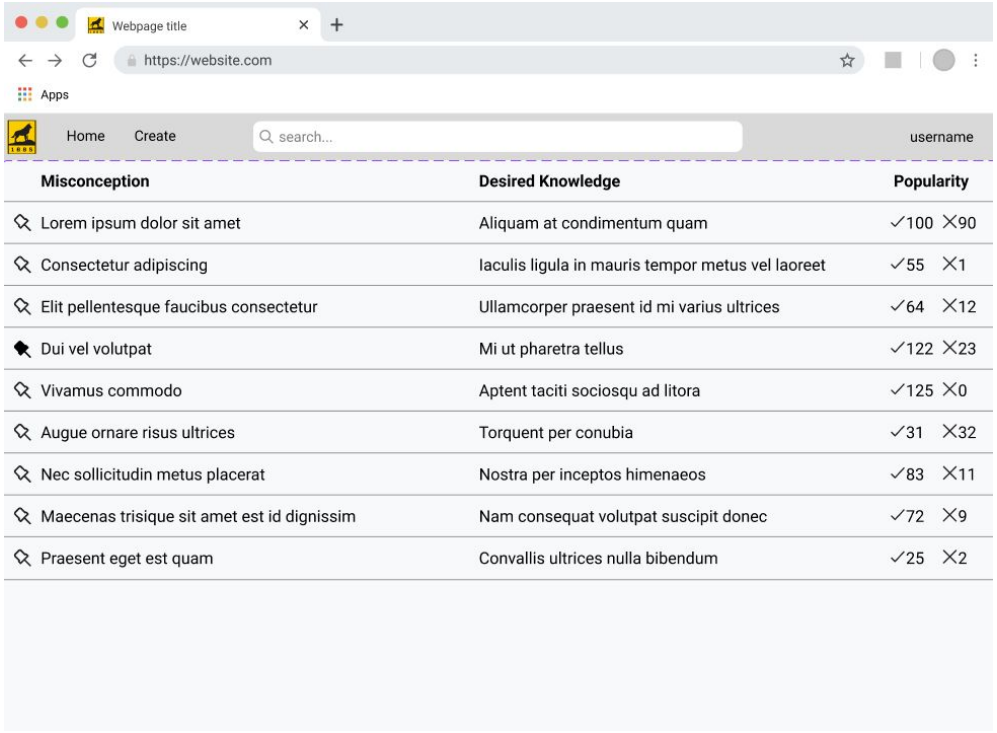
- Instructor/TA enters information about their new analogy
  - Form is not 100% complete, but they still click the submit button
- Before inserting into database, form validation will occur.
  - System will recognize which fields are missing, and will inform the user which fields they still need to fill out
- Once the form is valid, system will insert into database, and inform the user the success/error response.

Use Scenario 5: Creating analogy without account

- A student or non-logged in user accesses create page.
  - User is not authorized unless they have a registered instructor account
- System will prompt user to login/create an account.
  - Once this is done, user will be able to access the create page.

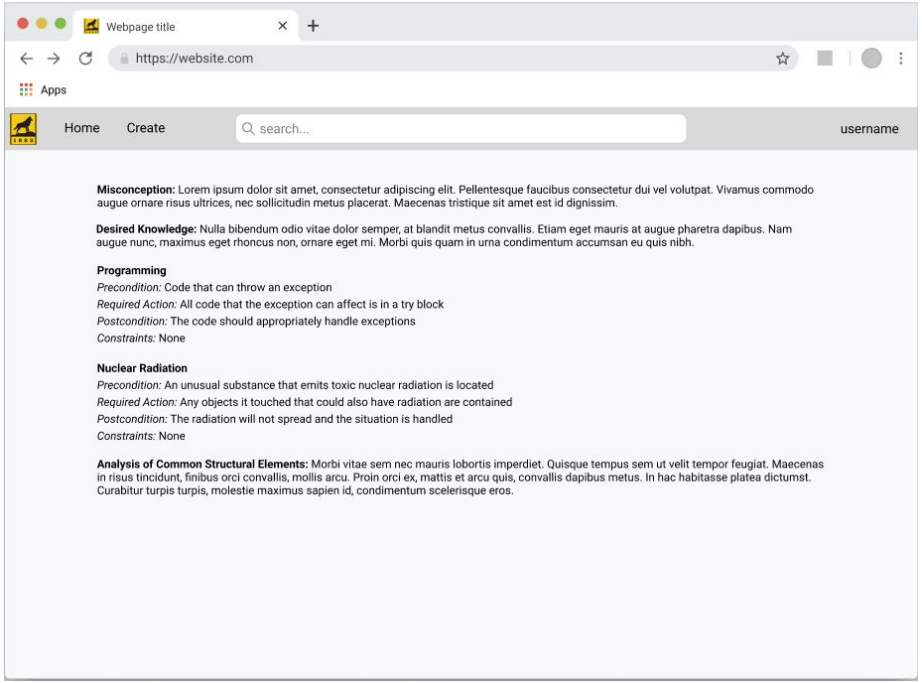
Paper Prototypes

Browsing Page

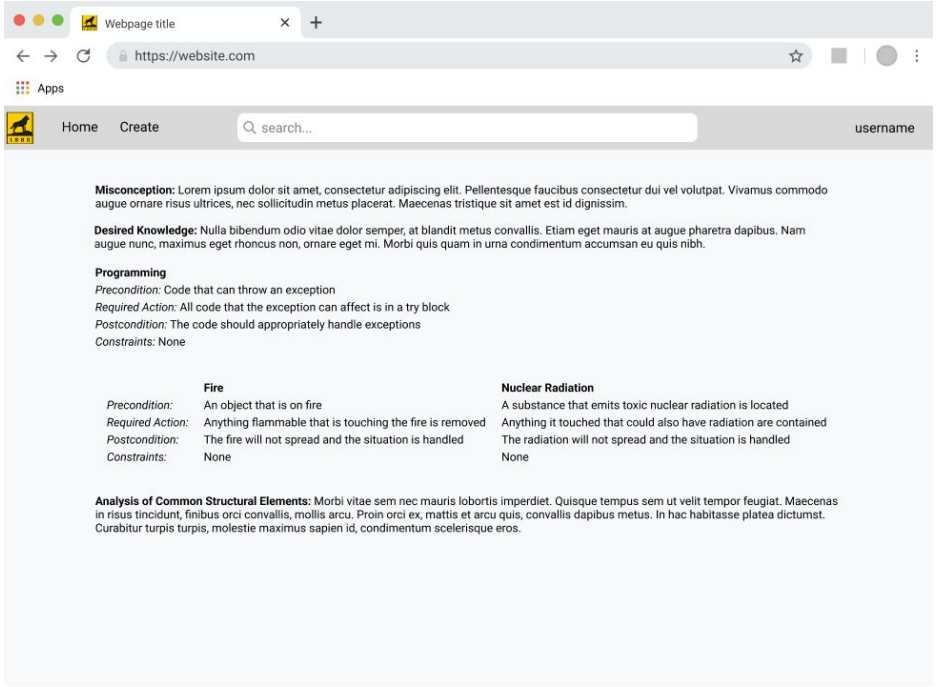


Misconception	Desired Knowledge	Popularity
Lorem ipsum dolor sit amet	Aliquam at condimentum quam	✓100 ✕90
Consectetur adipiscing	Iaculis ligula in mauris tempor metus vel laoreet	✓55 ✕1
Elit pellentesque faucibus consectetur	Ullamcorper praesent id mi varius ultrices	✓64 ✕12
Dui vel volutpat	Mi ut pharetra tellus	✓122 ✕23
Vivamus commodo	Aptent taciti sociosqu ad litora	✓125 ✕0
Augue ornare risus ultrices	Torquent per conubia	✓31 ✕32
Nec sollicitudin metus placerat	Nostra per inceptos himenaeos	✓83 ✕11
Maecenas trisique sit amet est id dignissim	Nam consequat volutpat suscipit donec	✓72 ✕9
Praesent eget est quam	Convallis ultrices nulla bibendum	✓25 ✕2

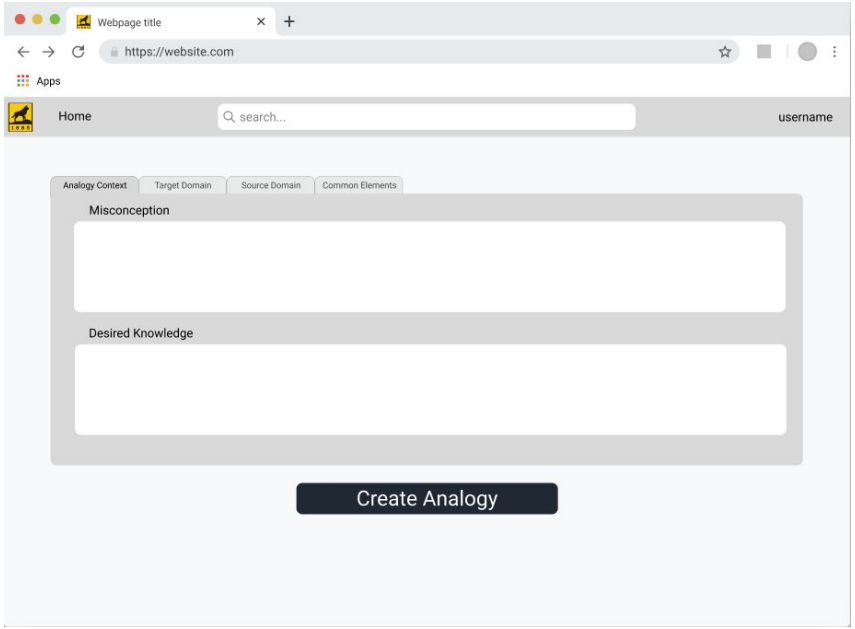
Analogy Page

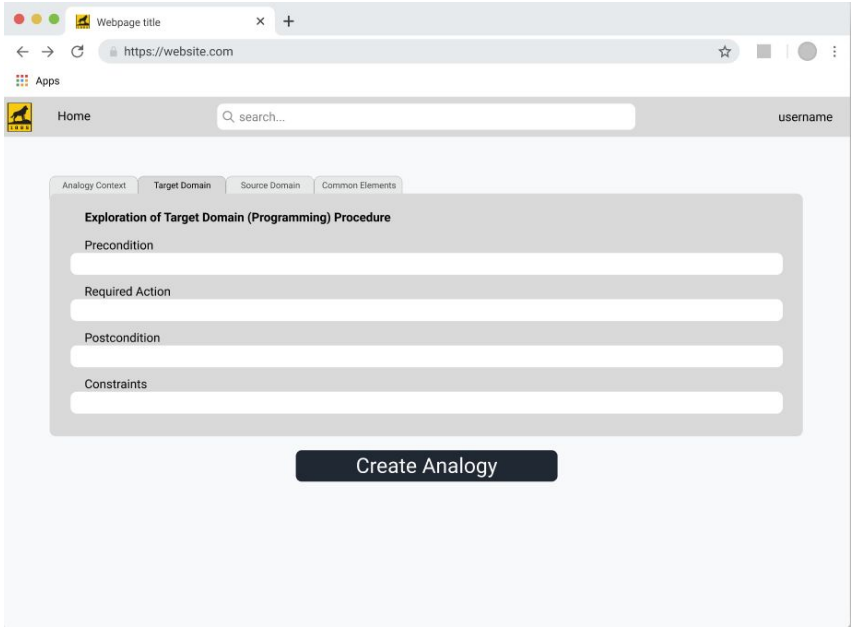


Analogy Comparison Page

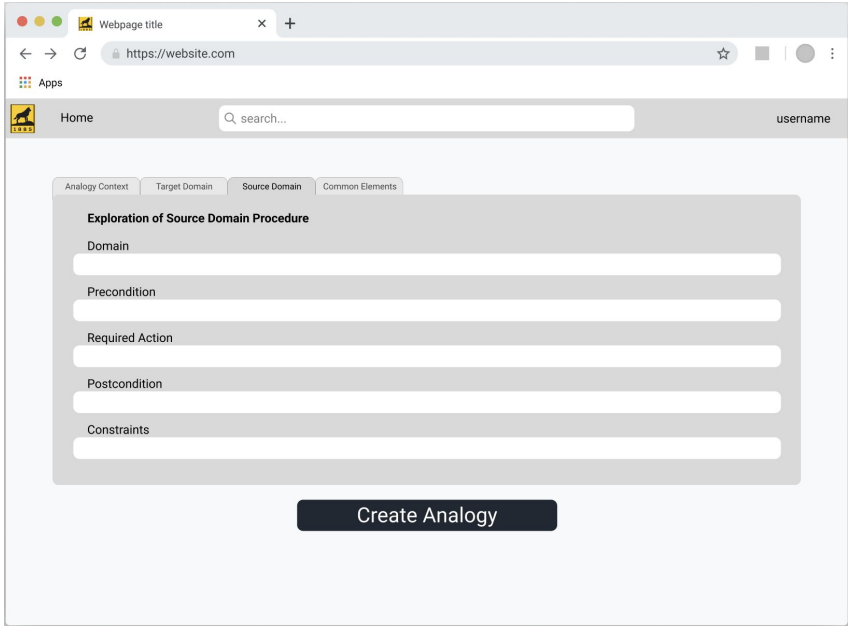


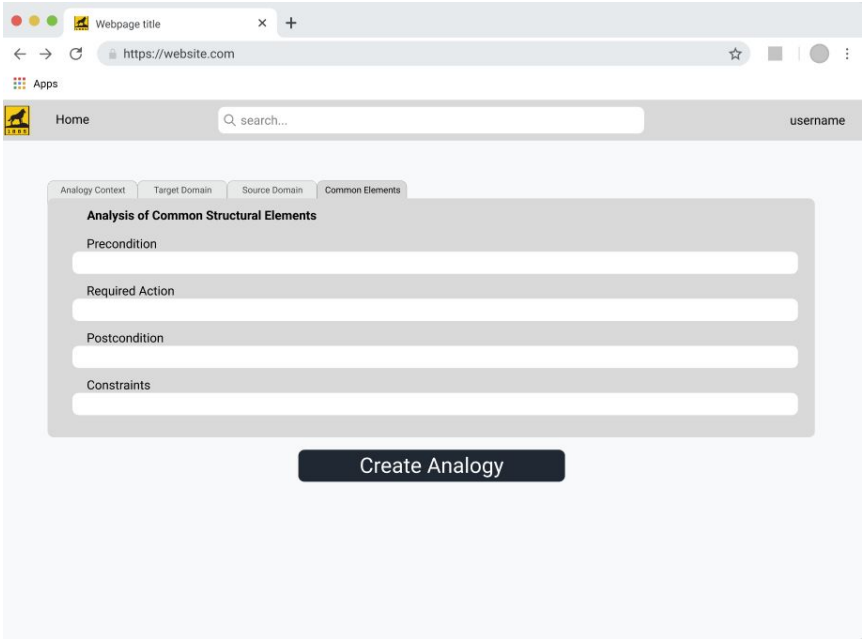
Create Analogy Page



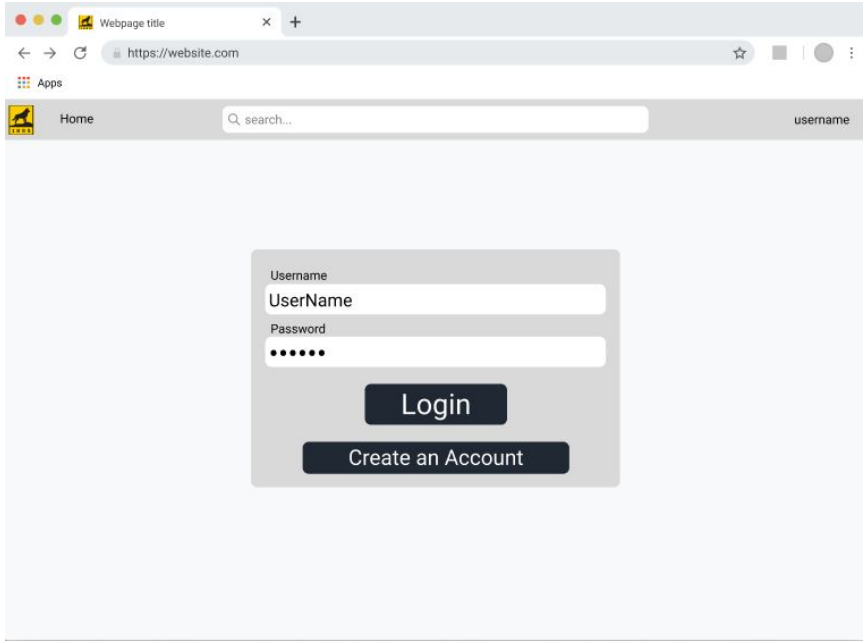


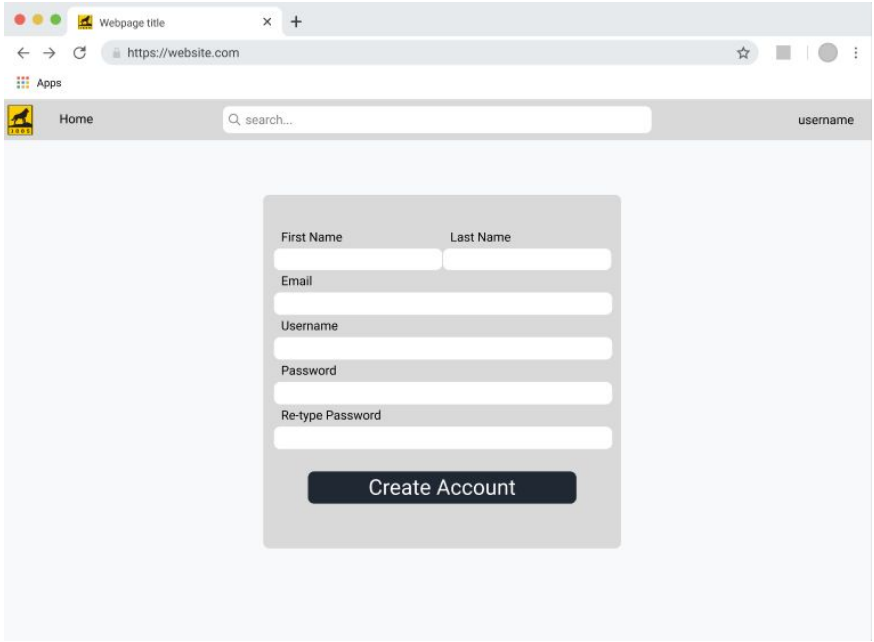
Create Analogy Page pt 2



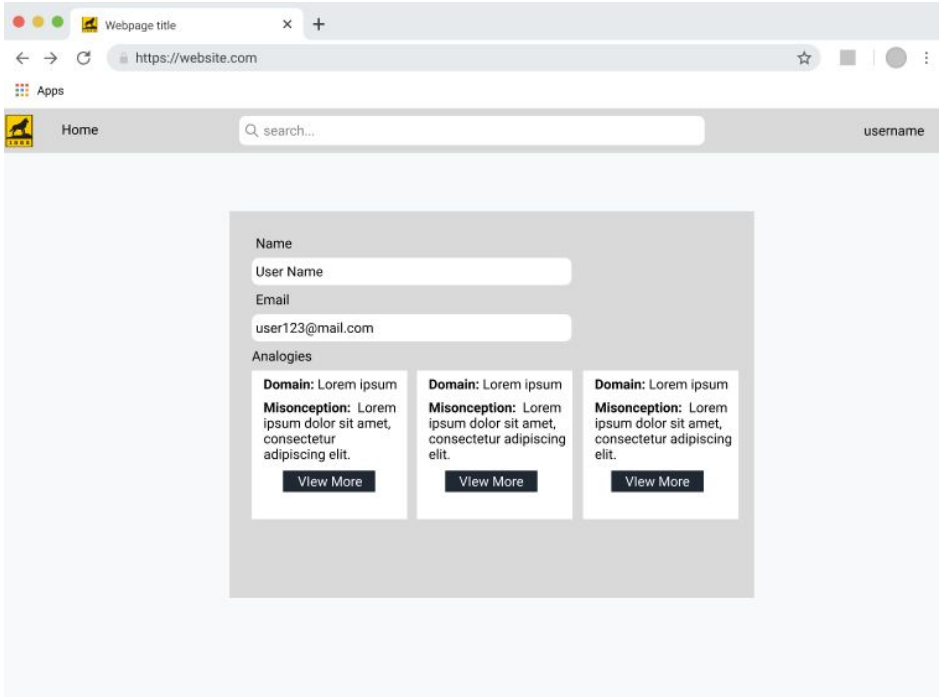


Signup and Login Page





User Info Page



Usability Goals and Concerns

Goals

- Make analogies accessible
- Explain computer science concepts with real-world examples
- Make comparisons to computer concepts to further understanding
- Allow professors & assistants to rate the analogies
- Compare analogies of similar topics in a side-by-side format

Concerns

- Comparing analogies in a comprehensible way
- Bugs/Error handling
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Thanks For Watching!
Any Questions?