



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)



Demonstration of UI

Browsing Pages (Prototype)

 Home Create <input type="text" value="Q search..."/>		username
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 tristique sit amet est id dignissim	Nam consequat volutpat suscipit donec	✓72 ✕9
 Praesent eget est quam	Convallis ultrices nulla bibendum	✓25 ✕2

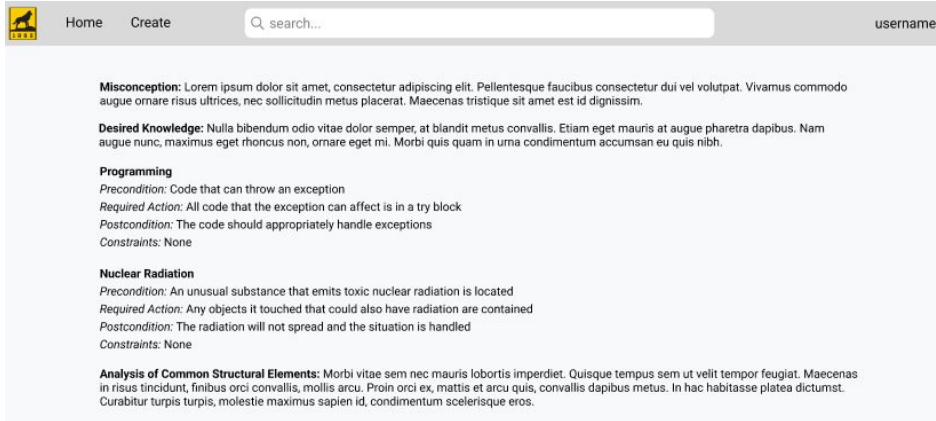
Browsing Pages

Misconception	Desired Knowledge	Compare	Popularity
Capitalization of variable does not matter	Variable names are case sensitive	Compare	0 0 (+0)
Type restated on variable reuse	Declaration of type is associated with variable name	Compare	0 0 (+0)
Scanners store inputs to variables automatically	Obtained values must be stored immediately or they are lost	Compare	0 0 (+0)
Multiple scanner creation for single input source	Only one scanner per location is necessary	Compare	0 0 (+0)
Variables can be named reserved words	Reserved words have special meaning in Java	Compare	0 0 (+0)
Primitives and their wrapper classes are identical	Primitives and reference types are distinct	Compare	0 0 (+0)
ASCII bit shift does not affect non-alphabetic characters	Shift affects any ASCII characters unless a condition states otherwise	Compare	0 0 (+0)
Scanner requires a delimiter to be set up	Scanner has a default delimiter on instantiation	Compare	0 0 (+0)

Misconception	Desired Knowledge	Compare	Popularity
Scanners store inputs to variables automatically	Obtained values must be stored immediately or they are lost	Compare	0 0 (+0)
Encapsulation is limited to variables	Encapsulation can be used on anything a user does not need to interface with	Compare	0 0 (+0)
Objects all have the same value for instance variables	Each object has its own version of the instance variables	Compare	0 0 (+0)
variables with the same name in different scopes have the same values	Separate scopes are independent	Compare	0 0 (+0)
A variable can't reference itself during assignment	Operations occur before an assignment	Compare	0 0 (+0)
variables can be named reserved words	Reserved words have special meaning in Java	Compare	0 0 (+0)
Scanners store inputs to variables automatically	Obtained values must be stored immediately or they are lost	Compare	0 0 (+0)

Analogy Page

Prototype



The prototype shows a header with a logo, navigation links for 'Home' and 'Create', a search bar, and a 'username' field. The main content area contains four sections: 'Misconception', 'Desired Knowledge', 'Programming', and 'Nuclear Radiation'. Each section includes a 'Precondition', 'Required Action', 'Postcondition', and 'Constraints'.

Misconception: Lorem ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque faucibus consectetur dui vel volutpat. Vivamus commodo augue ornare risus ultrices, nec sollicitudin metus placerat. Maecenas tristique sit amet est id dignissim.

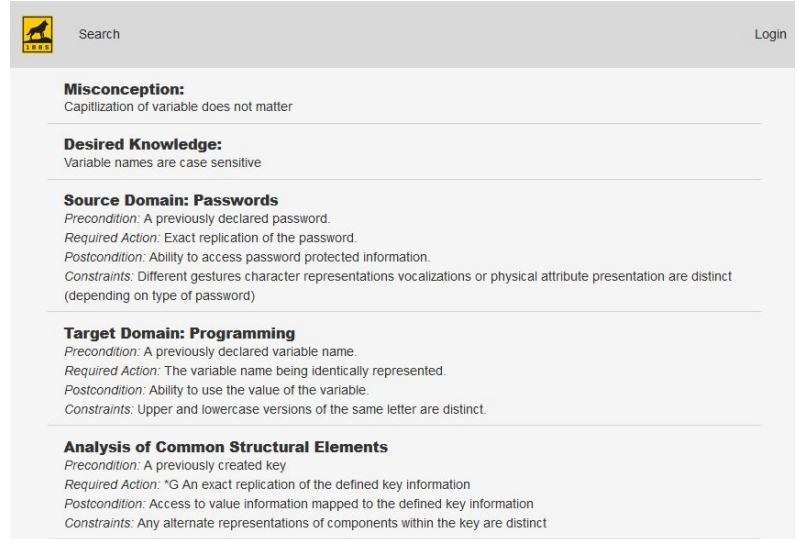
Desired Knowledge: Nulla bibendum odio vitae dolor semper, at blandit metus convallis. Etiam eget mauris at augue pharetra dapibus. Nam augue nunc, maximus eget rhoncus non, ornare eget mi. Morbi quis quam in urna condimentum accumsan eu quis nibh.

Programming
Precondition: Code that can throw an exception
Required Action: All code that the exception can affect is in a try block
Postcondition: The code should appropriately handle exceptions
Constraints: None

Nuclear Radiation
Precondition: An unusual substance that emits toxic nuclear radiation is located
Required Action: Any objects it touched that could also have radiation are contained
Postcondition: The radiation will not spread and the situation is handled
Constraints: None

Analysis of Common Structural Elements: Morbi vitae sem nec mauris lobortis imperdiet. Quisque tempus sem ut velit tempor feugiat. Maecenas in risus tincidunt, finibus orci convallis, mollis arcu. Proin orci ex, mattis et arcu quis, convallis dapibus metus. In hac habitasse platea dictumst. Curabitur turpis turpis, molestie maximus sapien id, condimentum scelerisque eros.

Implementation



The implementation shows a header with a logo, a 'Search' button, and a 'Login' link. The main content area contains four sections: 'Misconception', 'Desired Knowledge', 'Source Domain: Passwords', and 'Target Domain: Programming'. Each section includes a 'Precondition', 'Required Action', 'Postcondition', and 'Constraints'.

Misconception:
Capitilization of variable does not matter


Desired Knowledge:
Variable names are case sensitive

Source Domain: Passwords
Precondition: A previously declared password.
Required Action: Exact replication of the password.
Postcondition: Ability to access password protected information.
Constraints: Different gestures character representations vocalizations or physical attribute presentation are distinct (depending on type of password)

Target Domain: Programming
Precondition: A previously declared variable name.
Required Action: The variable name being identically represented.
Postcondition: Ability to use the value of the variable.
Constraints: Upper and lowercase versions of the same letter are distinct.

Analysis of Common Structural Elements
Precondition: A previously created key
Required Action: *G An exact replication of the defined key information
Postcondition: Access to value information mapped to the defined key information
Constraints: Any alternate representations of components within the key are distinct

Analogy Compare (Prototype)

 Home Create username

Misconception: Lorem ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque faucibus consectetur dui vel volutpat. Vivamus commodo augue ornare risus ultrices, nec sollicitudin metus placerat. Maecenas tristique sit amet est id dignissim.

Desired Knowledge: Nulla bibendum odio vitae dolor semper, at blandit metus convallis. Etiam eget mauris at augue pharetra dapibus. Nam augue nunc, maximus eget rhoncus non, ornare eget mi. Morbi quis quam in urna condimentum accumsan eu quis nibh.

Programming
Precondition: Code that can throw an exception
Required Action: All code that the exception can affect is in a try block
Postcondition: The code should appropriately handle exceptions
Constraints: None

Fire	Nuclear Radiation
<i>Precondition:</i> An object that is on fire	A substance that emits toxic nuclear radiation is located
<i>Required Action:</i> Anything flammable that is touching the fire is removed	Anything it touched that could also have radiation are contained
<i>Postcondition:</i> The fire will not spread and the situation is handled	The radiation will not spread and the situation is handled
<i>Constraints:</i> None	None

Analysis of Common Structural Elements: Morbi vitae sem nec mauris lobortis imperdiet. Quisque tempus sem ut velit tempor feugiat. Maecenas in risus tincidunt, finibus orci convallis, mollis arcu. Proin orci ex, mattis et arcu quis, convallis dapibus metus. In hac habitasse platea dictumst. Curabitur turpis turpis, molestie maximus sapien id, condimentum scelerisque eros.

Analogy Compare Page

Analogy #1 ✖	Misconception	Desired Knowledge	Compare	Popularity
Analogy Context	Capitlization of variable does not matter	Variable names are case sensitive	Compare	0 0 (+0)
Misconception Capitlization of variable does not matter Desired Knowledge Variable names are case sensitive	Type restated on variable reuse	Declaration of type is associated with variable name	Compare	0 0 (+0)
Source Domain	Scanners store inputs to variables automatically	Obtained values must be stored immediately or they are lost	Compare	0 0 (+0)
Target Domain	Multiple scanner creation for single input source	Only one scanner per location is necessary	Compare	0 0 (+0)
Common Structural Elements	Variables can be named reserved words	Reserved words have special meaning in Java	Compare	0 0 (+0)
	Primitives and their wrapper classes are identical	Primitives and reference types are distinct	Compare	0 0 (+0)
	ASCII bit shift does not affect non-alphabetic characters	Shift affects any ASCII characters unless a condition states otherwise	Compare	0 0 (+0)
	Scanner requires a delimiter to be set up	Scanner has a default delimiter on instantiation	Compare	0 0 (+0)
	Setting the result to double will stop integer division truncation	Floating point must be introduced to the division for floating point results to be remembered	Compare	0 0 (+0)
	Primitive assignments maintain references	Primitive assignments copy a value to another primitive	Compare	0 0 (+0)
	Code can be anywhere in a java file	The code should be contained within a class	Compare	0 0 (+0)
	Semicolons are not needed to end statements	Semicolons should end all regular statements	Compare	0 0 (+0)

Create Analogy Page (Prototype)

Home username

Analogy Context | Target Domain | Source Domain | Common Elements

Misconception ?

Desired Knowledge ?

Create Analogy

Home username

Analogy Context | Target Domain | Source Domain | Common Elements

Exploration of Target Domain (Programming) Procedure

Precondition ?

Required Action ?

Postcondition ?

Constraints ?

Create Analogy

Create Analogy Page

Analogy Context Target Domain Source Domain Common Elements

Analogy Context

Misconception ?

Desired Knowledge ?

Create Analogy

Analogy Context Target Domain Source Domain Common Elements

Analogy Context

Misconception ?

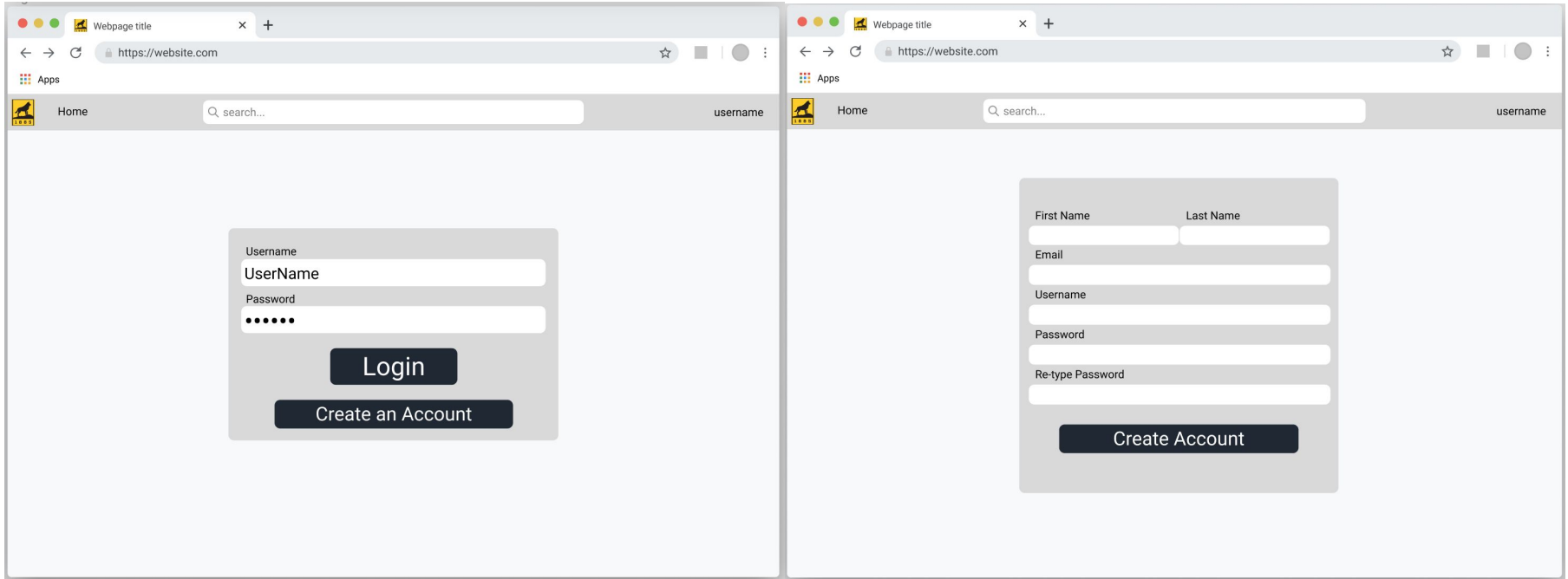
Looks good!

Desired Knowledge ?

Looks good!

Create Analogy

Registration and Login Page (Prototype)



Registration and Login Page



Search

Login

Please login to create or like analogies.

Username

Password

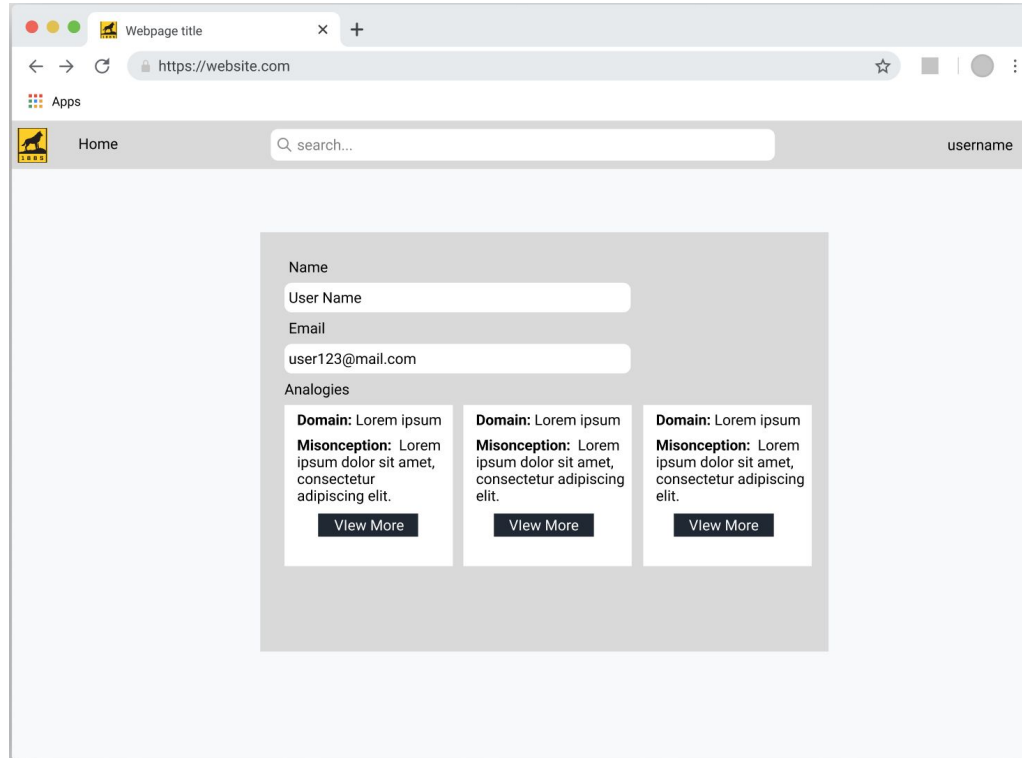


Remember me

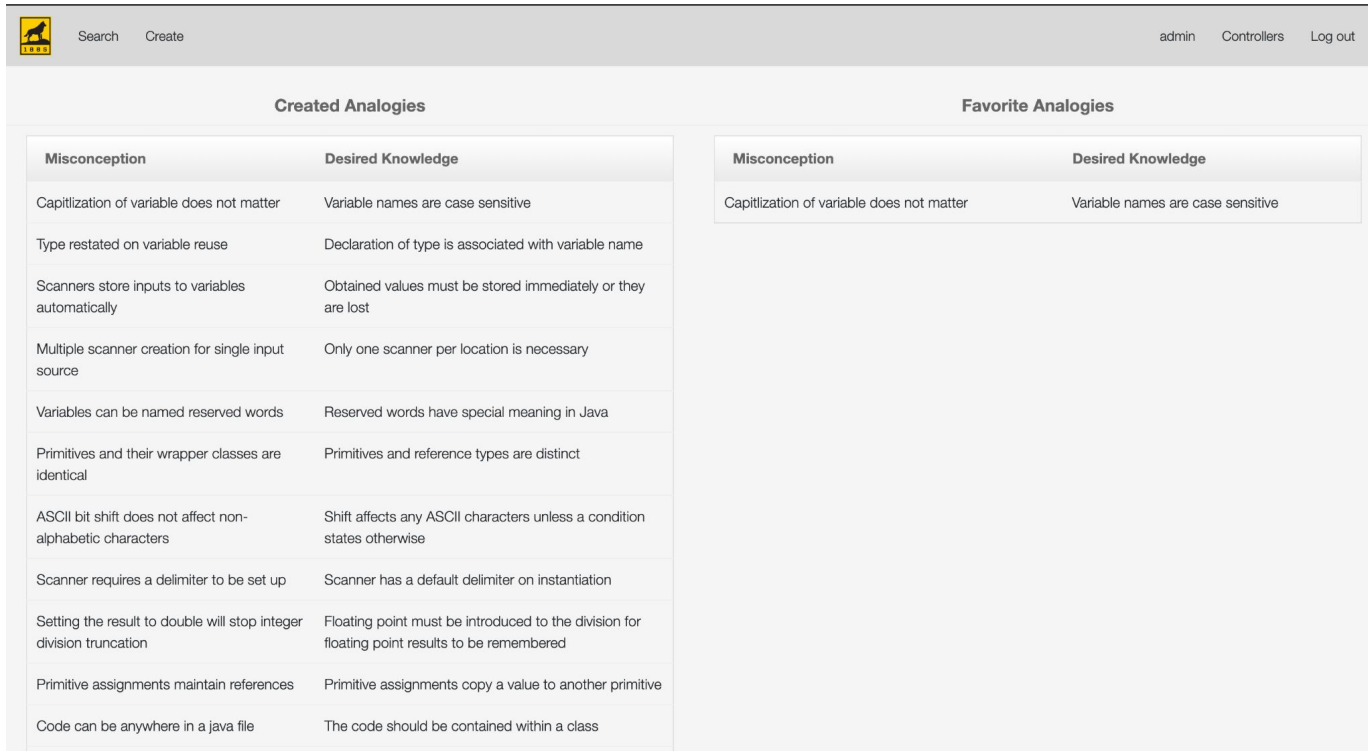
SIGN IN

Don't have an account? [Register](#)

Account Page (Prototype)



Account Page



The screenshot displays a web interface for an account page. At the top left, there is a logo for 'U.S.A.' and navigation links for 'Search' and 'Create'. At the top right, there are links for 'admin', 'Controllers', and 'Log out'. The main content area is divided into two sections: 'Created Analogies' and 'Favorite Analogies'. Each section contains a table with two columns: 'Misconception' and 'Desired Knowledge'.

Misconception	Desired Knowledge
Capitlization of variable does not matter	Variable names are case sensitive
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Code can be anywhere in a java file	The code should be contained within a class

Misconception	Desired Knowledge
Capitlization of variable does not matter	Variable names are case sensitive



Live Website Demo

Usability Concerns

Concerns

- Accessibility of analogies
- Comparing analogies in a comprehensible way
- Bugs/Error handling

TODOs

Completed

- Create analogies
- View & search analogies
- Compare analogies
- Login/registration
- Administrative roles
- Account page
- Likes and favorites

Plan to Complete

- Help page



Thanks For Watching!
Any Questions?

