

Antipattern Presentation

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App Description

This application is an attempt to create a more user-friendly introduction to regular expressions. This is done by providing a block language, adaptable workspace, area for test cases, and a help page.

The App:

Block RegEx Help

The screenshot shows the Block RegEx application interface. On the left is a block palette with the following items: a green 'Expression:' block, a blue 'Text:' block, a red 'Beginning' block, an orange 'End' block, a purple 'Include' block with options 'a-z', 'A-Z', and '0-9', a purple 'Exclude' block with options 'a-z', 'A-Z', and '0-9', a green 'Range Incl.' block with 'From' and 'To' fields, a green 'Range Excl.' block with 'From' and 'To' fields, an orange 'Incl. Whitespace' block with options 's', 't', 'n', and 'cr', an orange 'Excl. Whitespace' block with options 's', 't', 'n', and 'cr', and a purple 'Or' block. On the right is a canvas with a single green 'Expression:' block. At the bottom right of the canvas are navigation icons: a plus sign, a minus sign, and a trash can.

Generated String:

Text to Check	Should Match	Shouldn't Match	Actual Result
	<input checked="" type="radio"/>	<input type="radio"/>	✗

Block RegEx Help

Block Reference

Jump To Section

- Expression
- Text
- Include Character
- Exclude Character
- Range Include
- Range Exclude
- Include Whitespace
- Exclude Whitespace
- Or
- Repeat
- Anything
- Store As/Refer To
- Beginning
- End

Expression Block



Indicates the start of the regular expression. This block will always be on the canvas, and only blocks attached to it will be evaluated.

Expression Block



Indicates the start of an expression, used to add more expressions to Or blocks.

Text Block



Matches text exactly as input into the block



Matches: "Hello World", "Hello Worldddd"

Does not Match: "Hello", "hello world", "HelloWorld"

Test Scenarios (1 & 2)

- In-Person, record conversations via Zoom
- Scenario 1 - Ascending in difficulty
- Scenario 2 - Randomized difficulty
- 10 separate trials
 - 3 min per trial
 - Given tutorial (“Help page”)
 - Last 5 trials - Think Aloud
- Survey Questions
- Interview Questions

1. **Name:** Text Block

Instruction:

Use a Text Block to generate a regex string to capture the literal string of “Apple”.

Match Case(s):

Text to Match	Should Match	Shouldn't Match	Actual Result
Apple	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Expected Solution:

Expression: `Text: Apple`

10. **Name:** Match a sentence

Instruction:

Generate a regex to capture any string that starts with “This”, does not contain capital letters after “This”, and ends in “1”.

Match Case(s):

Text to Match	Should Match	Shouldn't Match	Actual Result
This is the hardest 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
This is NOT the hardest 1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
This is the hardest one	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Expected Solution:

Expression: `Start Text: This Repeat 0 to Infinity times Text: 1 End`
Exclude `a-z` `A-Z` `0-9`

Interview Results

Descriptives:

Class Year:

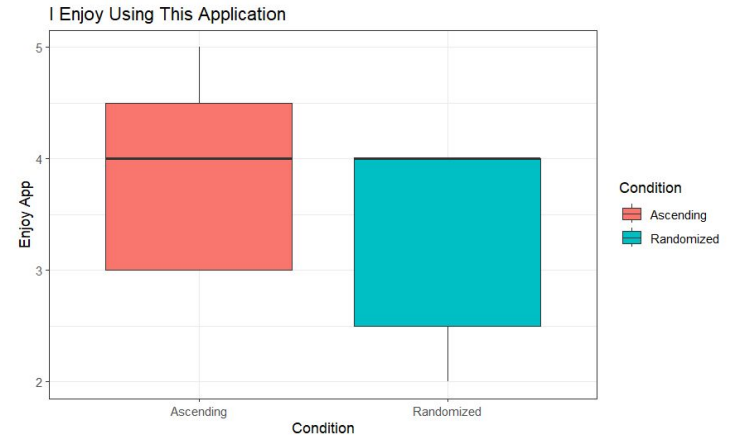
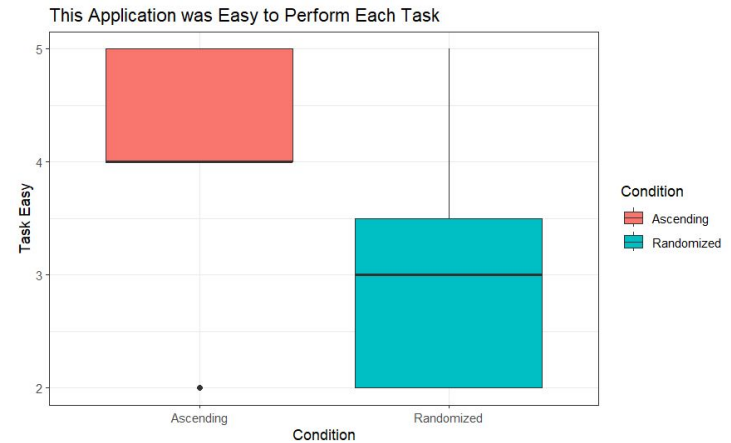
1-2: 3

3-4: 4

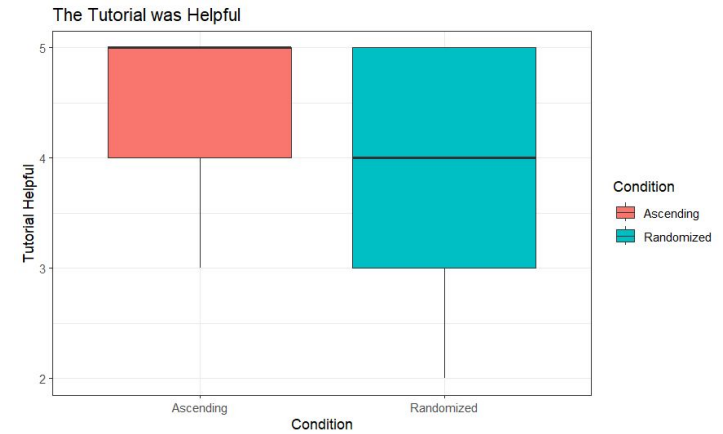
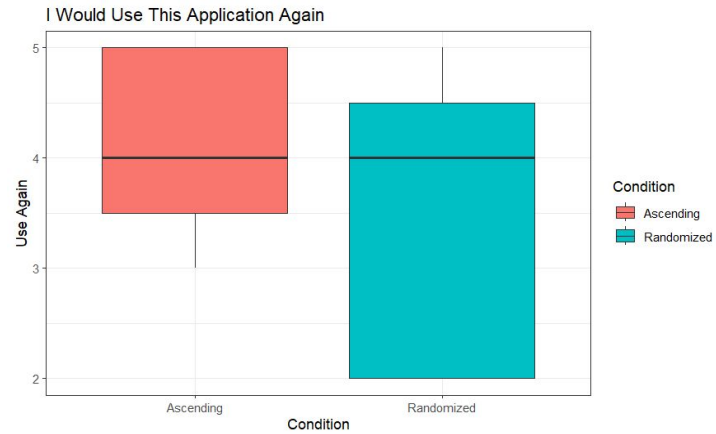
Grads: 6

Easy to read: 4.5 (Very Easy)

Regex Familiarity: 2.2 (Not Much)

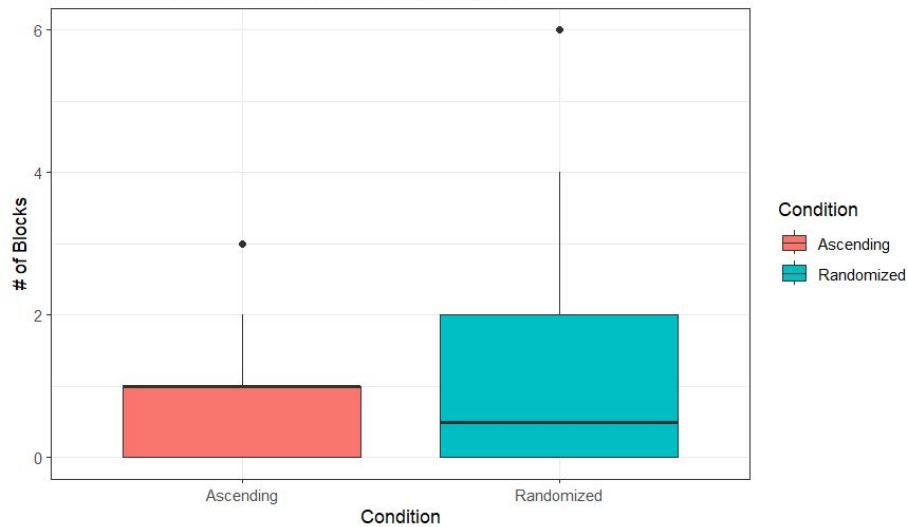


Interview Results



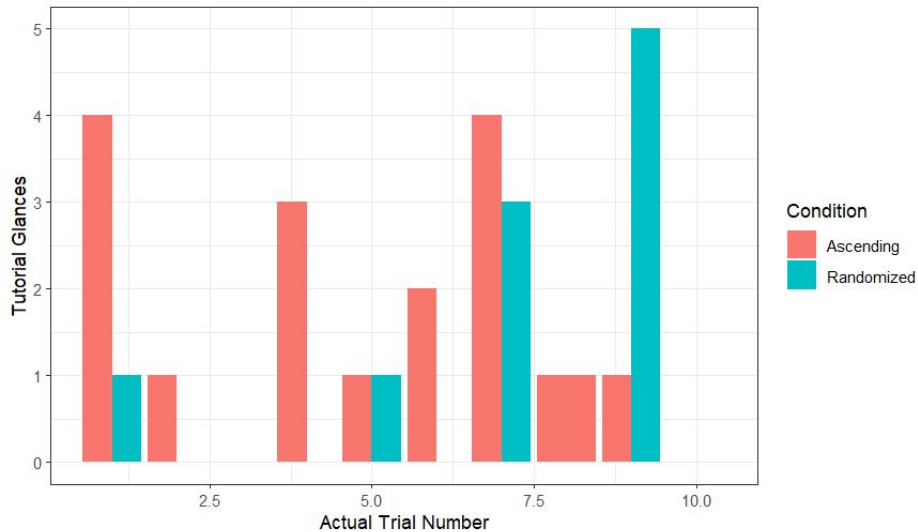
Scenario Results

Unnecessary Blocks Used Across Conditions



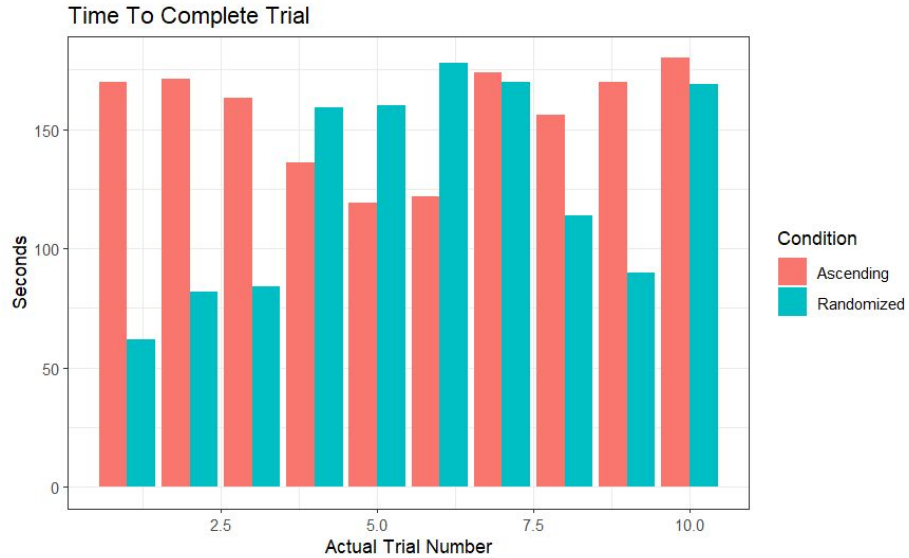
$$t(51) = -1.50, p = .139$$

Number of Tutorial Glances Across Trials

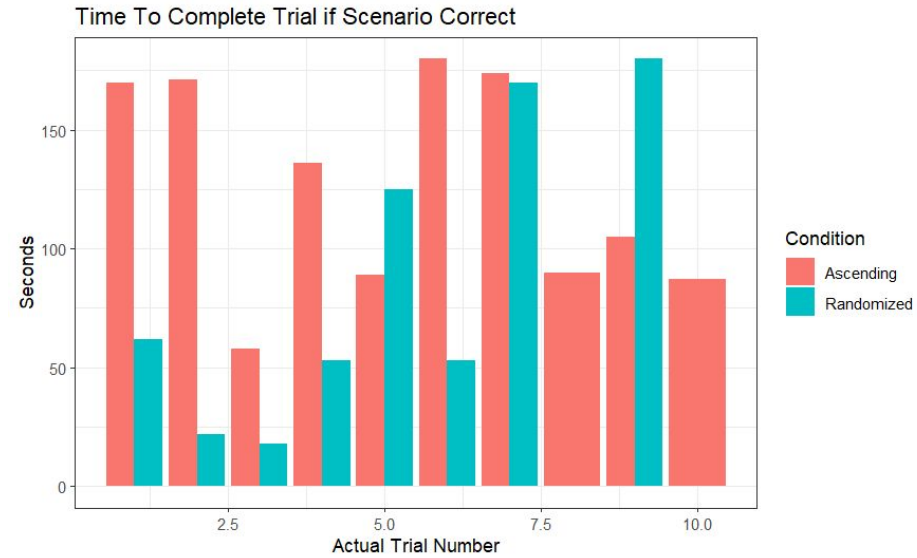


$$t(87) = 2.22, p < .05$$

Scenario Results



$t(78) = 2.35, p < .05$



$t(44) = 2.45, p < .05$

Think Aloud Results

Block	Participant Confusion
Anything	<ul style="list-style-type: none"><li>● Uncertainty on if it applied to one character or more
Or	<ul style="list-style-type: none"><li>● Unsure as to why there was a third section to the block
Range Include/ Exclude	<ul style="list-style-type: none"><li>● Often treated as a repeat block<li>● Misconception that the “range” refers to a range of characters/indexes from the input<li>● Only one of the two inputs was filled in numerous times
Repeat	<ul style="list-style-type: none"><li>● Referred to as a “slider” by a participant<li>● At least one participant tried to use it without any blocks inside it
(All)	<ul style="list-style-type: none"><li>● The existence of the tooltips is not obvious to most

Bugs

- The *Beginning* block is named Start in its screenshots on the help page.
- If you type in a test case and have no blocks beside *Expression*, the test case calls it a pass.

The Good

“Drag & Drop system was smooth”

“Test cases were straight-forward”

“Tutorial Page helped understand SOME blocks”

“The app was very easy to read”

The Bad

“Looping was not easy”

“Example strings on the help page would be nice”

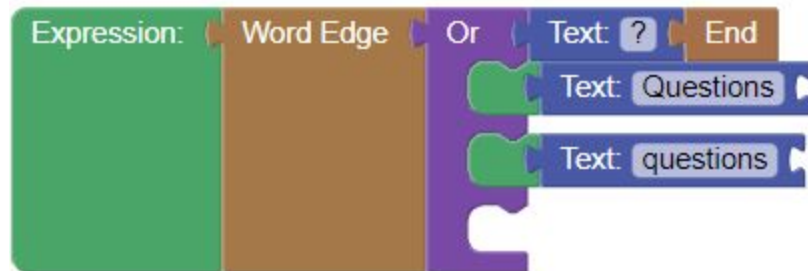
“Where is the *Start* block?”

“What is *Word Edge*?”

“I had issues navigating the tutorial”

Recommendations

- High Impact
 - Adding examples to help page
 - Emphasizing one-character blocks
 - Adding additional indication on how to use *Range Include/Exclude* blocks
- Medium Impact
 - Fixing help page to match workspace (color scheme + terminology)
 - Make tooltips more obvious
- Low Impact
 - Organizing blocks
 - Allowing the original *Expression* block to move without moving the entire canvas
 - Adding 'clear' or 'reset' buttons (All & Clear Test Cases)



Generated String:

`\b(?:Questions|questions)?\b`

Text to Check	Should Match	Shouldn't Match	Actual Result
Questions?	<input checked="" type="radio"/>	<input type="radio"/>	✓
Any questions	<input type="radio"/>	<input checked="" type="radio"/>	✗