Visual Regular Expressions for Querying and Exploring Event Sequences

Emanuel Zgraggen
Steven M. Drucker
Danyel Fisher
Robert DeLine
Pass Incomplete
Pass 11 yards
Pass 33 yards
Timeout
Run 4 yards
Pass Interception

sports: play-by-play
Search

View Product A

View Product B

Add to Cart

Login

Checkout

telemetry / logs
Today's Deals

Mountain Bike - 400-W Red, 42
$577.12
This bike delivers a high level of performance on a budget. It is responsive and... 

HL Mountain Frame - Red, 42
$1364.50
Each frame is hand-crafted in our... 

HL Mountain Handlebars
$44.54
All-purpose bar for on or off-road... 

Road Bike - 750 Black, 52
$539.99
Entry level adult bike, offers a... 

HL Fork
$229.49
High-performance carbon road fork... 

Accessories

Hitch Rack - 4-Bike
$120.00
Carries 4 bikes securely; steel construction; fits 2" receiver Hitch. 

Mountain Bottle Cage
$9.99
Tough aluminum cage holds bottle... 

All-Purpose Bike Stand
$159.00
Perfect all-purpose bike stand for... 

Road Bottle Cage
$8.99
Aluminum cage is lighter than our... 

Water Bottle - 30 oz.
$4.99
AWC logo water bottle - holds 30 oz...
query languages  visualizations
query languages

Querymarvel
[Jin et al., 2009]

[Monroe et al., 2013]
[Fails et al., 2006]
query languages

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visualizations

MatrixWave
[Zhao et al., 2015]
"Climate change can no longer be denied—or ignored." —President Obama http://ofa.bo/d4PC  #ActOnClimate

WATCH: In the weekly address, President Obama talks about his commitment to #ActOnClimate. http://ofa.bo/e4NL

ICYMI: Check out the full video from the #ObamaTownHall on equal pay, child care, and more. http://ofa.bo/a4Qe

This article debunks six big myths on climate change: http://ofa.bo/s4n1 (h/t @goodhousemag) #ActOnClimate

"We shouldn't have to choose between rewarding work and raising a family." —President Obama

"Anything that holds women back holds back the entire country." —President Obama #EqualPayNow

"Ensuring equal pay for women is a no-brainer." —President Obama #EqualPayNow

"Because our workplaces have changed, we have to change with them." —President Obama #EqualPayNow

"I believe in broad-based economic growth ... that's why we call it middle-class economics." —President Obama

"We all have a part to play to make sure that everybody's got a fair shot in this society." —President Obama
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action=startApp
referral=bing.com

event 2
action=search
query=spare parts

event 3
action=search
query=bike

event 4
action=search
query=bike

event 5
action=appClose
event 1
action=startApp
referral=bing.com

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concatenation
quantifiers
<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Project</th>
<th>Tools</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alice</td>
<td>Product Manager</td>
<td>Online productivity app 1</td>
<td>R, Python, SQL</td>
<td>Test coverage</td>
</tr>
<tr>
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<td>R, Python, SQL, Excel</td>
<td>Reproducing crashes</td>
</tr>
<tr>
<td>Charlie</td>
<td>Developer</td>
<td>Online source control repository</td>
<td>SQL, Dashboards</td>
<td>End-to-end usage</td>
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<tr>
<td>Dorinda</td>
<td>Data Scientists</td>
<td>Online source control repository</td>
<td>SQL</td>
<td>Justifying business cases</td>
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<td>SQL, Hadoop, Sumologic</td>
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<td>Technologies</td>
<td>Responsibilities</td>
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we should unbundle these features!

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cs.brown.edu/~ez

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