SAGE Spring 2019 – UI, Learning Metrics, Scoring

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User Interface

Motivation

- Improve major UI bugs
- Get usability of SAGE ready for eventual field study

Login Error 1

- "Please enter your email/password" error message appearing after email and password are input
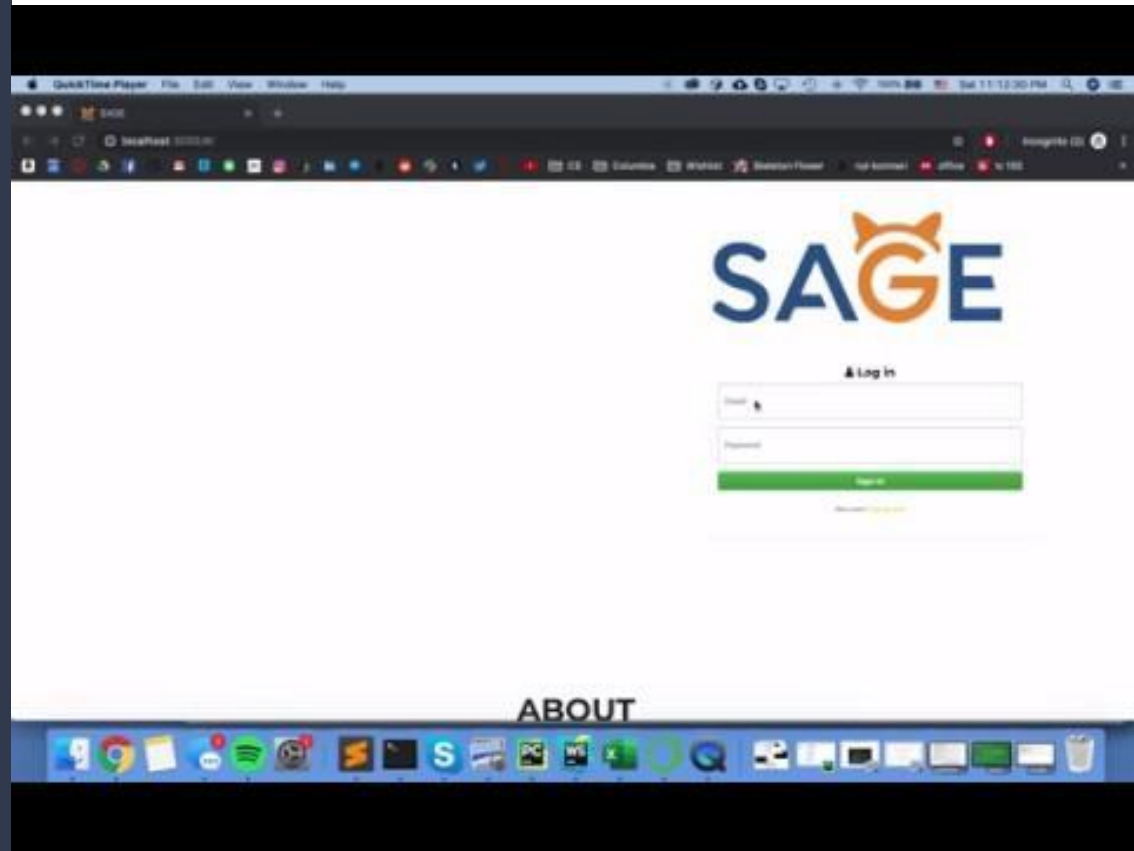
Login Fix 1

- Error message shows only when an email/password is input and subsequently deleted
- On filled form, there are no errors unless values are incorrect
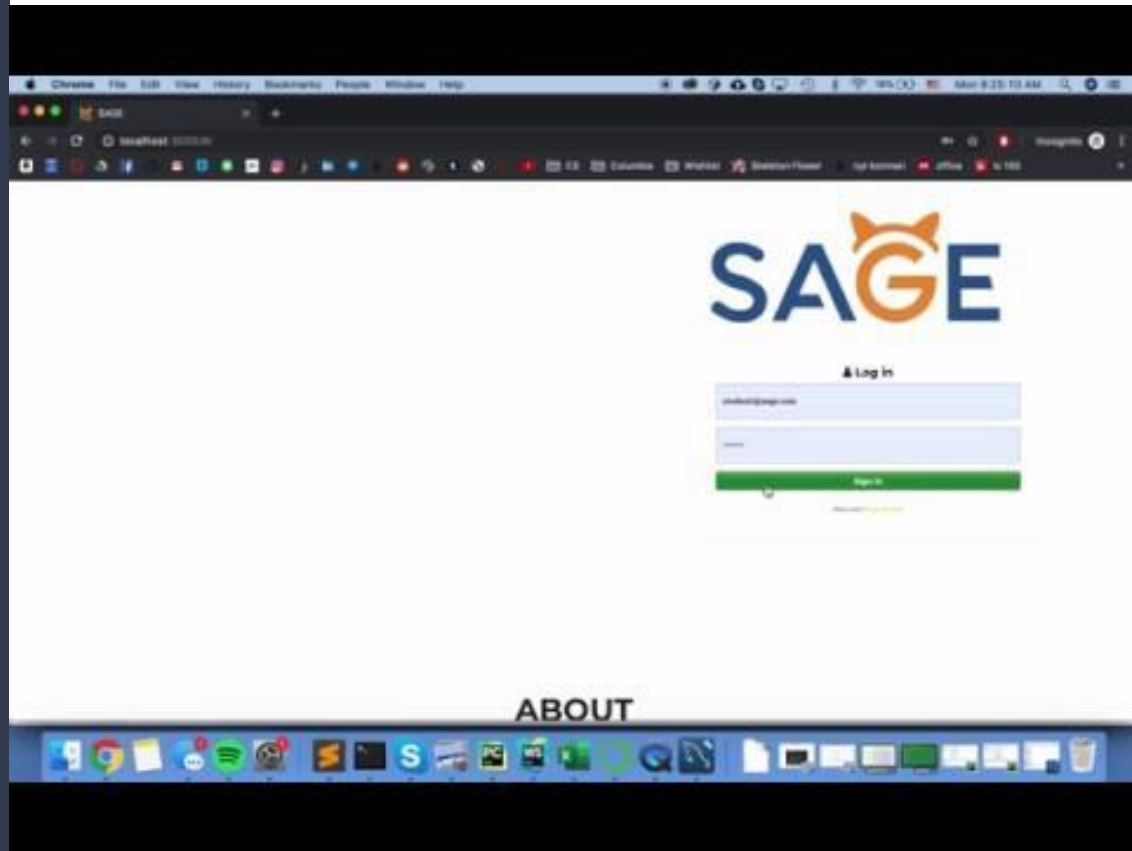
Login Error 2 Fix

- After one failed login attempt, sign in button disabled and reload needed to re-enable button
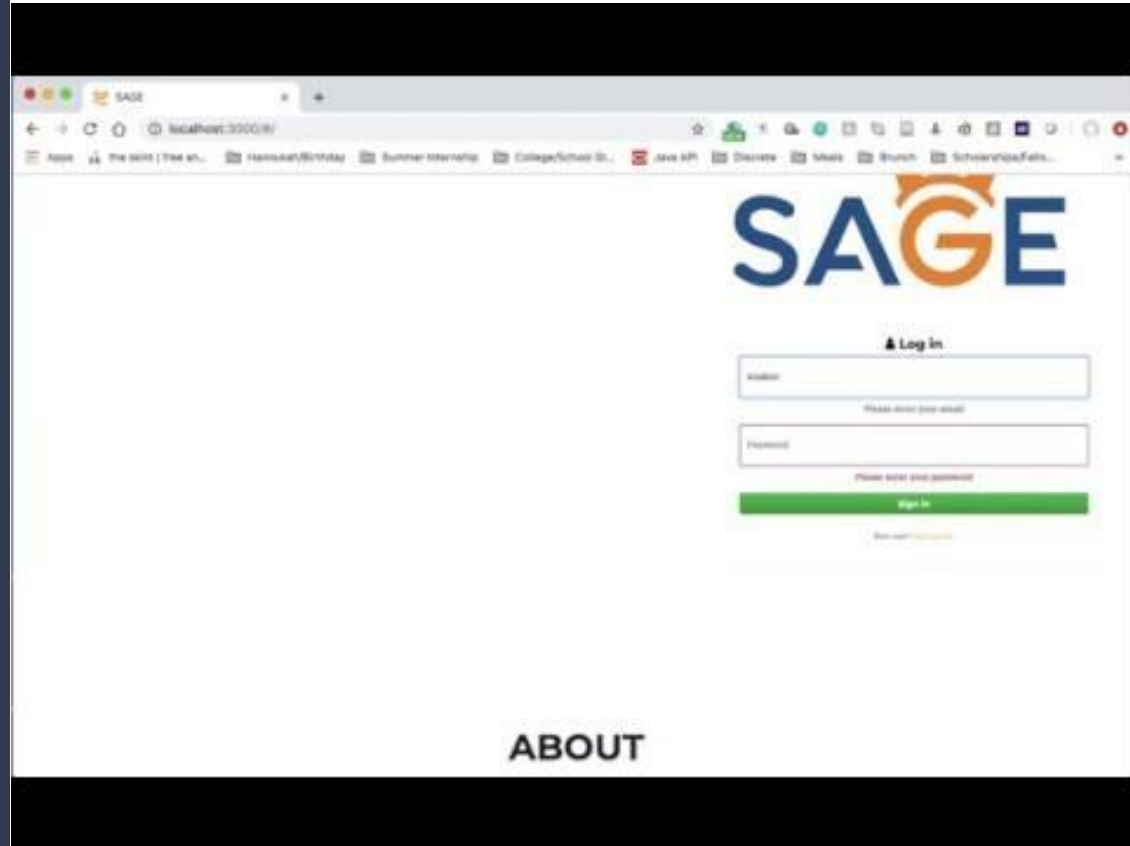
Missions/Quests Error

- Incorrect "Quests" heading for "Missions" page
- Incorrect routes upon clicking on mission/quest links, lead to empty page
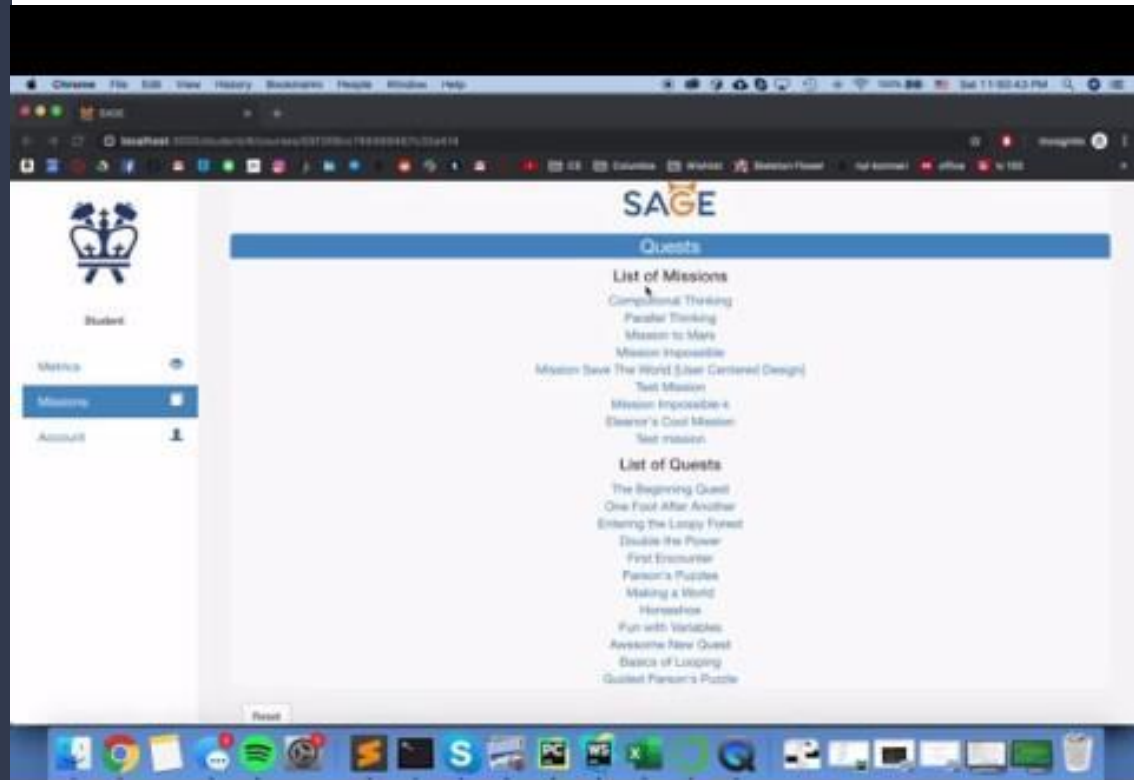
Missions/Quests Fix

- Restructured student missions/quests page to be analogous to instructor's mission management page
- Fixed paths to correct mission/quest pages

Game Objective Editor Issues

- Objective and Game IDs listed instead of names

Game Objective Editor Fixes

- Added Name entry to sage-node
- Replace list of Ids with list of Names, and [Name] placeholder if name does not exist

Learning Metrics

Motivation

```
Cheries-MacBook-Pro:sage-node cheriechu$ hairball -p mastery /Users/cheriec
hu/Desktop/coding-projects/sage/test.sb2
/Users/cheriechu/Desktop/coding-projects/sage/test.sb2
{'Abstraction': 0, 'Parallelization': 0, 'Logic': 0, 'Synchronization': 0,
'FlowControl': 0, 'UserInteractivity': 0, 'DataRepresentation': 0}
Total mastery points: 0/21
Average mastery points: 0.00/3
Overall programming competence: Basic
```

- Measure students' CT scores after game submission
- Display metrics onto visual representation
- Only dummy data available at start

Quest CT scores

Complications

- Accessing game data from sage-login
- Hairball-Kurt errors
- Attempt to download sb2 binary

```
"remainingSeconds": "513",
"submitMsg": null,
"endTime": "1556655049618",
"studentID": "59f369cc748499467c32a414",
"assignmentID": "5a69302c513b5a0f0cfa0ded",
"objectiveID": "undefined",
"selfExplanation": "sad",
"sb2File": "PK\n\bX\u0081\u0082N9d é'a/project.json½XꝹ6Nþ\nBꝨꜩ÷$É.z\u0097:ëu±@÷Rd\u008bÀ\u008b<P%«+\u0091*Iꝯ+òꜩ)Úꝏ¥5ꜱ\t\"sHg~óῙbûþ] \u0092ß9Mk|O\u0082GM\\Q¥?l
ˆꜱÒÒ\blꝨꜩꝰ|\u009f\u009e\u0082h\u008f\u009bÉCQ¼Ú,F«»x3ꜱ«ῆh¾Y˜íÇꝅ\u0098ÉQpM\u0082Òῆ\u009fꜱꜱ|SÑ\"ꜱrM\u009e\u0082Úb<PiVÑ(\u009a-ꜱÉÂ]_-
§\u009hÉn]ÆÉÉ4¾Ú\u099qÏïF5U\u008eBꝏℓℓOῆ$\u008aU_-ꜰÉÉdˉY~?³Àꝏ4ÇÉpew®Ó3þÀó Çè#v<3ëⓊ\u0089Jꝏꜱ�025MꝰꜱꝰḀüL¾_1
ˉ\u0084:\u009bà\u008añ.ꝒÉ\u009cMÓd\u009eO\u0092x>'Ò,ÉY\u0092ÇÓÉ<¾9Ð}
+ÒMÀ\u0081\u0091\u0086\u009d8Ú\u0092‰ÒxV\u0085c\u008bg\u0090YS\\0þjÂL\u0085h\u009a]\bÚR:Q\u009a>gR4Q{ZbⓊ\u0099\u00994BGῆam=Oã\u009c\u009a1bꝊaÍfc\u009aꜰⓄa¾\¼
ôéMÉ\u008e_ꝎkUÍfJT;]\n~ꝏℱ\u0085|H1ₑ\\3ū_ÒmM½\u0086{â Y§\u0093d\u009a40qk²{c/ñ\/ꜰ/Ꝓ&ꜱÉË<ÎÀ¹*dÑÍ\u0087ᵴ\u0096íꜱ*É2\u0099À\u009a0\u009c§}'K\u009aⓊ±ꝏÉ\u008c:
ℚ/3&VUꝰ¥_ᴤff\u009cꜱⓊZ1-ÀZÍj8W|¸t]~DÚ\u008cꜱ}M\u0088½>Q\u008d,5#iU;Î_\u0083Ủn7ꜱrÉ\b¾\u0089ᴥ\u009e~+\u009cꝣ4ÚꝒ±T-ÊÊ÷ⓄꜱÀ\u0097+IꝘQRⓄÏꜱ/Ꜳ'Dâ*ᵗx\u0081ⓄÊ±ˡⓄ\u0091q%$úqᴬCÓÓ-
ꜱⓊ\u0086+§Ꝙℓ,ꝳy!\u0090½S,ꝌJ\u0099ꜱꜱ_9\u008aJ/yÍÊᶠ\u0088ꜱ¾Íe÷ꜱꜱM+ꝯ\u0093Ò\u0092+À+\u0091,eꝨ\u0093¥Yꝣ\u0095#7g/\u009aꝡÉqꜵÓL\u0922?+ ¬À.ꝨꝞꜵÉḀZTÉÍ6ꝯ\u0093þ꒬\u0091NꝯꝨ¢
\rꜱϳꜱ#ÒᵗꝒḢꜰ<Ꝓℓ|ꜱÑ#Ⅎꜱᴤ÷\u0099ꜰ;Ϫℓ+ꝌℓÍÉⒶℓÓÊ¬ꜰÒꜰꜰ\u009b\u0082ⅉꜳxⒶℓ§5×7ᵀ*éꝌÀ\u009ꝅⓈÉ\u009ꜱⅇ¬+\u0098ⓇⓅ÷\u0085ⒷꝅÒaⒶÉ\u0096~Ꝁꜷ\u0089ꝒÚꜳ7É
\u009b\u009cÉ¥éêⅇꝝ#²³²\u008ekⒺ§ÉnⒾ⒞¥Ⓚ\u009b'0Tꜱ:OꝌꜱ²µⒹꜱH2pⲞWy\u0083\u008e%WⒺ©ñⅉⒻ`ÒꝳⒶⓇⅡⒶⓊⓆ¼ⅇ¥\u0098ⒻⅇⅇⒶⅆ¼Æ<\u0098?ⓈⒶⓊⅇꝰⓉⅇ<\u0084ᵣⒺ\u0090{}
¬Léℇ\u008fῆeⅇ\u0081Ꝑ\u0097!ⅇ_Ⓘꜵⱅ¼_ᴥ²j⁴KⒾⓅⒶ<§2×9zℓ*ₘ\"Àˉ\u0093ₛÍꜳ˙Ⓒⅇ\u009ℱxuⒽ{ꝡÒÍ}+¯ꜛⓄ@ℓ*ℓⅇⓈꜳⓄÉÓⓈⒶÓⲶⅆꜲ<\u0099!=ꜱᴤℳꜱℓⅈℓℳμꜱ?
ÿ*⬜÷ⅇⓊⓆC¬ꝯⓅX!˜²-¾ꜱⅇ¼ÞÚℓꜱᵧY˂ⓄˉPxⓄ²Ⱥ\u0082|«ℓꜵℬꜵⓆⓄ-\u0090ÒⓉ¼\u008fÀⅈⒸꜵⱅ\u008at\u008fꜱ\u0087%<Ⓞⅇⅈˉⱴé¬¢þ\u00898ꜱ:\u008aꜵℓꜵ²+|gℓⅨⲞⱃ3⁄\u0087x¼Ⓒ'Ⓝhⱂⲝ₀₀₀₀⬜{ÃⱯ\u0078₄Ⓡᐿⅇꜵꜱℓ:|
Ð\u009cⱴꜵ⬜8ℯ:]=ℱmⱴ\u0084ÉꝴñℱⓊ-ℯⅈVⱴ\u0087ꝴⓈⱴⓄⓆⲶℓⱴ\u0083ÇᐿⲞℓ\u009ℓ\u0090ZᐿⲞꜷ%Ⓢℯ¥Éℰ
ℯℳ₂Ⓐ5₁ þˉⱋⓅⓊₒⱴOⱴ₀₀ℬ»ℯ¹⁴\u00092ꜵℓⱴⓄꜵℓⱴℓ_¬ℯⁱⱙÓℱⲞⲞⱋⓊⱃⱴ⬜ᐿⲁⲁℓ#Ꝅ⬜Úℯⱅℯₓℓ⬜Õ₆Ⓢⱴᐿⱅℓ⬜ꜵⱵ⬜⁰ⱍ⬜⁰Ⓖ|ℓⱴⱴ⬜Ⓩ₄⬜⁰₁⬜⁰₈₈₀Ⓡfℓ\u0095G×\nⱑ²Jⱴ₂
ⱴꝒⱴªⱴℯⅆⱴ_°⬜\u0090⬜\u009dⅆℳⲄℳⱴYℓⱴ⬜⁰₉₅ⱴℓⱴⱴℯ+ⱴⱴⲄⱴℳⱴⓉℳⱴⱴℯ8ℓⱴNⱴ₄ₓℳⱴₓ+ᐿⱴ₄ⱴ⬜ℓⱴⱴⱴ₈₁Ⓣⱴℯⱴⱴℓⱴⱴⱴℯℓⱴⱴⱴⱴℯ⬜⁰₈ℓⱴⱴ₅ⱴⱴⱴℯℓⱴⱴⱴℯ⬜ℓℓℓℓℓⱴℓℓ
\u0090ℯℳⱴⲄ`₃ℳⅈℬⓅℯₓ=ℓⱃ₄ⱴ⬜⁰₈ⱴ₀ℓⱴℬⱴℯNℓₗⱴⱴℓ₄Yₗⱴⱴⱴℯℓⱴⱴℯℓℳℓⱴⱴⱴℯℓⱴ₄ℳⱴⱴⱴₓℓⱴ₀₃₀₀[_ⱴℬⱴⱴⱴℯ₄₄ℓⱴⱴⱴℯⱴⱴⱴⱴℯⱴₓ⬜⁰₈₀ℓⱴℯⱴⱴℯⱴⱴⱴ₈ⱴℯℯℓⱴ₀₈₃ⱴⱴℯℓⱴⱴⱴ₈ℓⱴⱴ₈₃À=₄ℓₓ)â³?
ᵉₗⱴÔℓ¬ⱴℬⱴ⬜⁰₉₄ⱴ⬜₀₀₄ℯℓⱴ⬜₀₀₈₆ℓ|{ⱴ⬜₀₀₈₇Xⱴ\u0095_±Ÿūₗℒ⁺ℓ⁺\u0095ⱌℓℯℓ₄Yⱴ⬜ℓℓⱴℓⲮℓℯ¬ⱴ\u009a₈8ⱴ\u009eⱴℓℯℓ9ℓⱴₒℬℓℯⲄⱠℯℯℳℓⱴ⬜⁰₉3ℓⱴℓⱴꜵ₈ℓℳÊℯ£ℓℯⱴ₃ℯⲄℳ±Ê/Vⱈⱴ₄YKⱳⱳṺⱴ₈ⱴℯ\u0084ℯⱴℯℯ\u0093⬜⬜
\u0082ℓⱴⱴ⬜⁰₈₈₅₁Ôⱴℯ⬜ℯℓⱴⱴ⬜⁰₈ⱴℯℯ⬜ℓℯⱴ⬜⁰₈ℯₛⱴ⬜ꜵⱴℓℯℯ₉₉ℯⱴℯℓⱴℯ₂ᵀ_ₘ₅ℯℓⱴ₄ₗⱴ\u0092ꝴ=\u008dℯ˛-ₒℯℯℓₓ\u0087ₛⱴ⁰ⅎℳⱴ⬜⁰₈ⱴ₅₆ℓℓ|Uℯòⱴℯℬℓℳ4ᵖ₉?
PKⱴⱴXⱴₓ\u0081ℓⱴ₀ₓⱴⱴₓ\u0082N\nℯ₈ⱴℯ₀.pngℯⱴ\u0089PNGℯℯⱴⱴⱴℯ|rℓⱴ⬜ℯⱴ⬜⁰₈ₘⱴℓℓⱴⱴ⬜⁰₈ℯ₇(µⓅⱠⱵ₄ℳ₄₁₁ℯ₆ₘⱗ>ⱴ⬜⁰₈₉ℯℬℯ\u0096ⓉⱗE₄Ⓞⱄℓ₈⬜®ℬˉⱴ⬜ℓ₂ℳℯ₄ℯ₄₅₁ₓ\u0081ℓⱴℯℯ₈₂Nℯ-
ℬ₁.pngℯ\u0089PNGℓℓrℯ₄nℳℯℓⱴⅉHⱴ⬜₄ℳⱴⱴ₈₈ⱴⱴ₄ₓ₄ℳ₉ⱴⱳℓⱴ₃₃₄₄₄ℯℓℳ₄₄ₓⱴℯℓⲂ₄ℳℬ₄ⱴℓℳℯℳ₄ℳⱴ₄₄ℯₓ₄ₓℳ₄ℓₓⲂℓⱴℬℓₓ\u0088ℓℯℓℯ\u0083Ⱥ₀₀₀ⱴ\u008ℓⱴ\u008ℓⲂℯⱴⱴℬ₄₄₀₀ℓⱴ₀₀₀ℓℬₒ₀₀₀₀ℓℳℯℓℬ₄₀₀₀₀ℓⱴ\
\u0083₀₄ₓℬ₄₄ⱴ₀₄ℓⲂℯⱴⱴ₀₄ₓℳ₄₄ℓₓℓ₀₀₀₄ℳₓℓₓℬℯℯ₀ₓ₄₄ℳℯℓℓ₀ₓℬℯₓ₄₄ℳℓℬ₄₄₄ℓₓℯℓℳₓℓₓℬℓ₀₀₀₀ℓℯℓℬ₄₄₀₀ℓⱳ₀₀₀₀ℓⱴℬ₀₀₀₀ℓₓℬℯₓₓₓℬ₄₄₄ℓₓℳℯⱴ₀₀₀₀ℓℬₓ₄ℓₓℬℓₓℬℓℓⱳ₀
À₀₀À₀₀₀ℳₓ₄₄₄ℓₓℳℯ₀₀₀₀ℓₓℬℯₓₓℳ₀₀₀₀ℓⱴℬ₄₀₀ℓₓₓₓℬₓ₄ℓₓ₄ℓₓℬℯₓ₄₄₄ℓₓ₄ℳℯℓₓ₄₄ℬℯ₀₀₀₀ℓₓ₄ℬℯ₀₀₀₀ℓₓℳℯⱴₓₓℬ₄₀₀ℓₓ₄ℳℯₓₓℳℯₓ₄ₓℬℓₓ₄₄ℳₓ₄₄₄ℓₓ₄ℬℯ₀₀₀₀ℓₓℳℯℓⱴℬ\
\u0083ₓₓℳₓ₄₄₄ℓₓℬℯℓₓ₄₄ₓℳₓ₄₄ℓₓₓⱴℬℯ₀₀₀₀ℓₓ₄₄ℬₓₓ₄₄ℳₓ₄ℓₓℳₓ₄₄ℓ₀ₓₓℬℯ₀₀₀₀ℓₓℬₓ₄₄₄ℬₓₓ₄ₓℳℓₓℬ₀₀₀₀ℓₓℬₓₓₓℳℯ₀₀₀₀ℓₓℬ₄ₓⱴₓₒℳℯₓₓℬⱴⱴₓℳ₄₄ℯₓⱴⱴₓℬℓₓ₄₄ℳₓ₄₄₄ℓₓ₄ℬₓ
À₀₀₀₀Àₓ₄ℓₓℳₓ₀₀₀₀ℓₓℳₓ₀₀₀₀ℓₓ₄₄ℓₓℳₓ₄₄ℓₓₓℳₓ₄ⱴℓₓℳ₀₀₀₀EₓⱴⱴⱴⱵℓℳₓ₄IENDℬℬˉ\u0082PKⱴⱴXⱴ₈₁\u0082Nⱴ₀₀₉ℱⱴⱴ₈₅®₀₀₀.wavRIFF(WAVEfmt
+\"VdataÒℯⱼrℓS<#ⱴ₀₀₉bₛₛ ₃ⱁⓇ¼_Úˡꝲꜳⅉⱄ\u0092ᐿℬ₈ℯⲄⱯⱮⱏℓℬₙℱⲄⱳⱴ)ₒℯⱴ₄₄nꝀⱋⱅꜰ₃ꜰÊⱡ₄₃jⱴⱴ₄₀₀₁%₀₀₀₀₀₉₉ⱄⱴ₄₄Yⱋ\u0090₈₄ℬˉＤⱴⱴⱴℯℯ₄ꜵⱅℬⲄⱠⱅⱖ\u0092ꜵⱴₓⱴ\u0080KYℛⱼ₉¬ℬⱼℓꜵ₉₉₉⁵₀₃₀₀₄ₓ₂ÊQ£ⱼQⱴ?}
ꜣⓄⲁℳℓ¼ₘ¬ℳ6*\u008₃₃À\u084ₒ₄/Wⱴ\u009fₛÀ₄º₁ᵧₓⲄℯ\u008ꜱⱴ\u0086₄ꜵ₈ꜵℬₒ₀₀₀₀ꜵﬂ#ꜱⱴ\u0092ℯⱗℓbⱉⱘQℯₗℬ~%:\u0089b₁ⱗⱴ\u0096#ₛ/ⱴℑ*ⱳⱟÀÊÙⱳÑℰℓ\u0094\"×ₕᐿ<ℓ5ℑ#ⱬ\tℓℑ₀ℓ#ℰﬂᐿÉℯⱂₑ\u00923*xⱴ+
<ℯ\u0094ₒ₄_×₈ℓꝺ[\\ˉ#H«ˉⱱ℘ℇℯⱴₛℇꜵ₃ℯℓ₀ₛ₈Ⓤℯⱊℯℬₓⱨⱴ\u0084É[
âⱂ₅Çℯㇰ₄₀₀₈₆ℯ₆ₒℓ₅_\u008₆ℯ=↯çℇ₀ℯℯ\u0096Çₓⱴ\u0084₆ℯⱴₗℯⱴℬⱴⱴ₀₀₉ₓⲁₑ\u0097ℓ₄ⱱ₄ⱴ₀₀₈₀₀₀₄Ô₄₅₄Nℯₙℓⱴ₄ₗℬℬℬₓ₄₄ⱴⱴ₄₄₄₄ℓⱴ\u008₆ℓ₄ⱳⱴ\u008₀PKℓⱴⱴ\u0081ⱴ\u008₄ℳⱴℬⱴₓℯⱴ₄nℓⱴⱴℯ₄ℳℯℓⱴ₄Xℓⱴ₄\u008₄Nℓⱴₓℳℯ₄ℬℬℬₓ₀₀₀₀O×₀₀ℓ₄.wavPKÓⱴ\"\,
\"hairball_score\": \"\",
\"blocks\": [
```
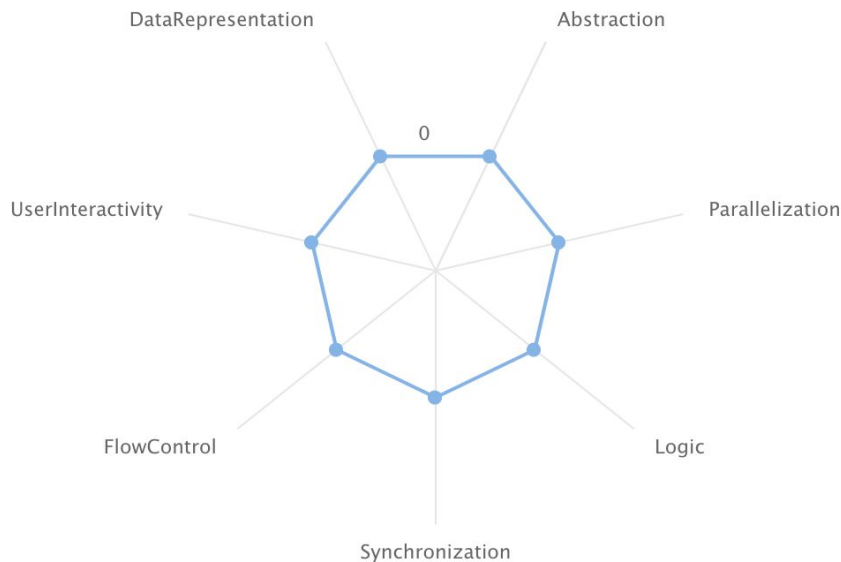
```
Traceback (most recent call last):
  File "/usr/local/bin/hairball", line 11, in <module>
    load_entry_point('hairball==0.1rc3', 'console_scripts', 'hairball')()
  File "build/bdist.macosx-10.12-x86_64/egg/hairball/__init__.py", line 149, in main
    self.path = None
  File "build/bdist.macosx-10.12-x86_64/egg/hairball/__init__.py", line 140, in process
    def __init__(self):
  File "/usr/local/Cellar/python/2.7.14/Frameworks/Python.framework/Versions/2.7/lib/python2.7/site-packages/kurt-2.0.7-py2.7.egg/kurt/__init__.py", line 268, in load
    project = plugin.load(fp)
  File "/usr/local/Cellar/python/2.7.14/Frameworks/Python.framework/Versions/2.7/lib/python2.7/site-packages/kurt-2.0.7-py2.7.egg/kurt/scratch20/__init__.py", line 588, in load
    zl = ZipReader(fp)
  File "/usr/local/Cellar/python/2.7.14/Frameworks/Python.framework/Versions/2.7/lib/python2.7/site-packages/kurt-2.0.7-py2.7.egg/kurt/scratch20/__init__.py", line 95, in __init__
    self.project.stage = self.load_scriptable(self.json, is_stage=True)
  File "/usr/local/Cellar/python/2.7.14/Frameworks/Python.framework/Versions/2.7/lib/python2.7/site-packages/kurt-2.0.7-py2.7.egg/kurt/scratch20/__init__.py", line 206, in load_scriptable
    scriptable.scripts.append(self.load_script(script_array))
  File "/usr/local/Cellar/python/2.7.14/Frameworks/Python.framework/Versions/2.7/lib/python2.7/site-packages/kurt-2.0.7-py2.7.egg/kurt/scratch20/__init__.py", line 290, in load_script
    blocks = map(self.load_block, blocks)
  File "/usr/local/Cellar/python/2.7.14/Frameworks/Python.framework/Versions/2.7/lib/python2.7/site-packages/kurt-2.0.7-py2.7.egg/kurt/scratch20/__init__.py", line 261, in load_block
    block_type = kurt.BlockType.get(command)
  File "/usr/local/Cellar/python/2.7.14/Frameworks/Python.framework/Versions/2.7/lib/python2.7/site-packages/kurt-2.0.7-py2.7.egg/kurt/__init__.py", line 1653, in get
    raise UnknownBlock, repr(block_type)
kurt.UnknownBlock: u'444EFE48-F617-D22A-850E-6FFFE5B01496'
```

```javascript
mongoose.createConnection('mongodb://sage-login:sag3-login@ds133328.mlab.com:33328/sage-login');
studentSubmissionModel.find({"studentID": studentId, "assignmentID" : gameId}).exec()
.then((submissions, error) => {
  console.log(submissions[submissions.length-1])

  var data = submissions[submissions.length-1]['sb2File'];
  fs.writeFile(gameId+".sb2.zip", data, function(err, data){
    if(err) {console.log("error occurred in writing file: ", err);}
    else {console.log("successfully wrote file " + gameId + ".sb2.zip")
    }
  });
  return fs.writeFile(gameID+".sb2.zip");
  console.log("we returning: ", gameId+".sb2.zip");
  return (gameId+".sb2.zip");
  return './'+gameId+"."
```
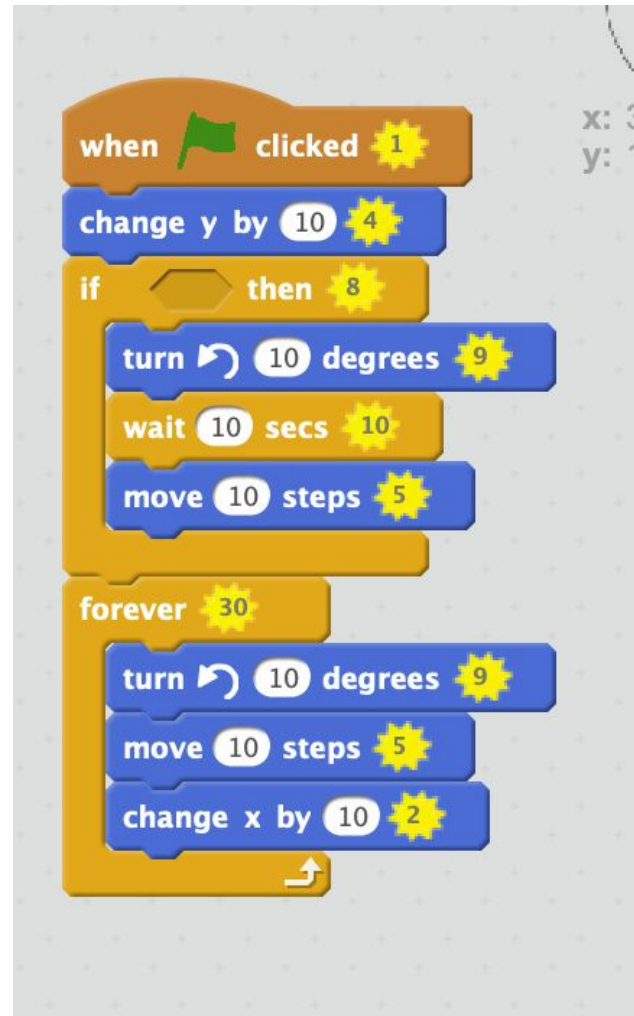
Quest Metrics Display

- Manually download and run hairball on sb2
- Inserting analysis results into database
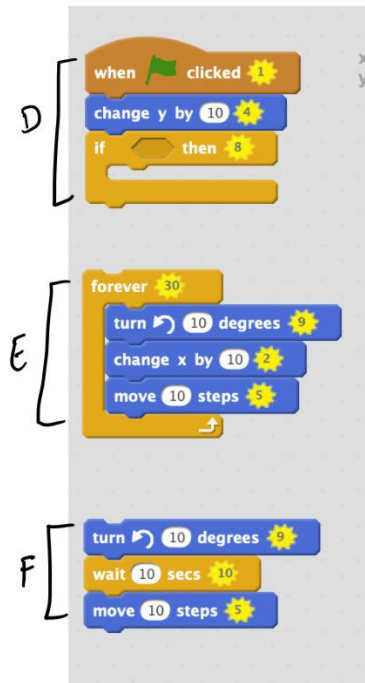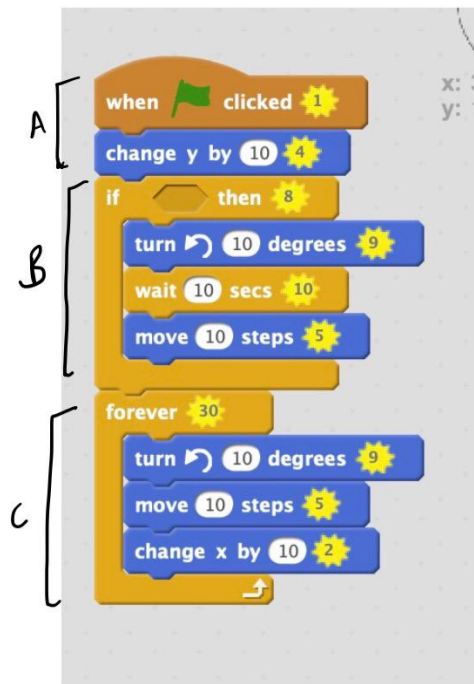- Display on quest metrics spider graph
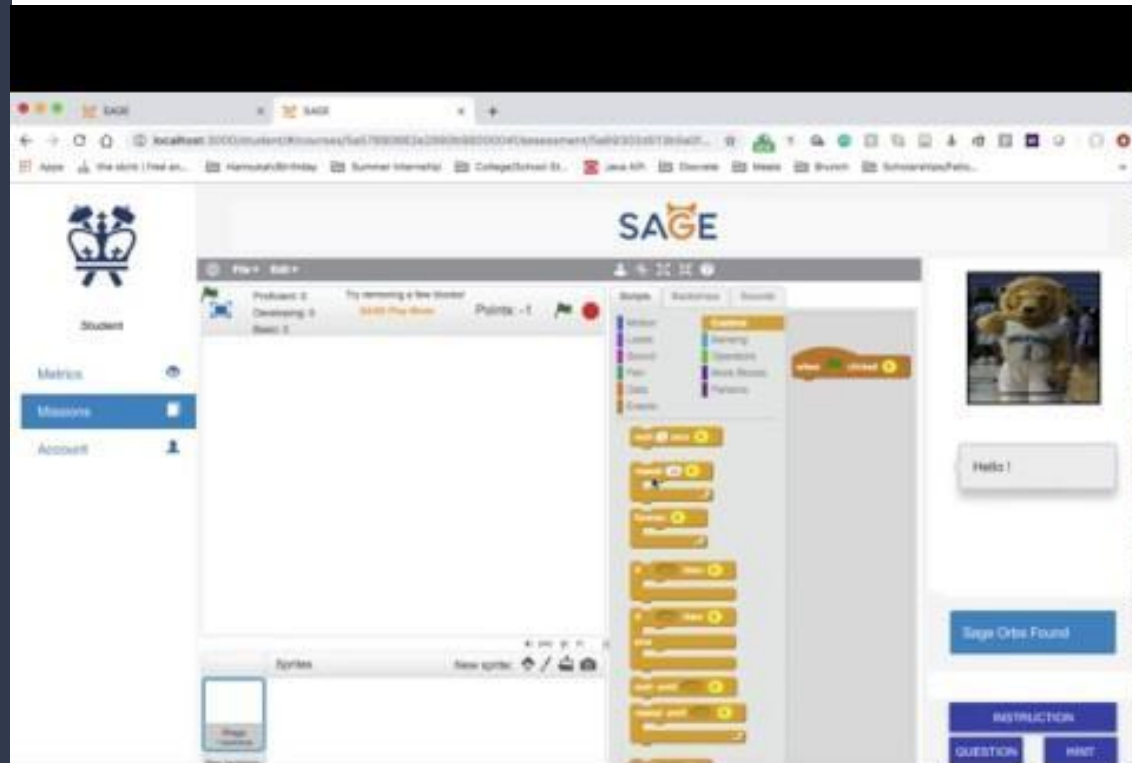
Parson's Scoring

- Allow students to work non-linearly
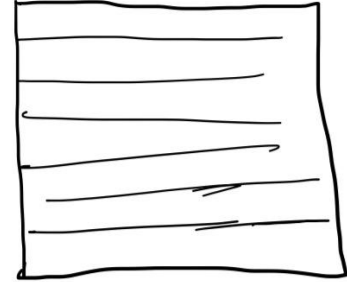- Give meaning to scores

Parson's Scoring

- Allow students to work non-linearly
- Give meaning to scores

Parson's Scoring

- Allow students to work non-linearly
- Give meaning to scores

Parson's Scoring

- Allow students to work non-linearly
- Give meaning to scores

Future Work

User Interface

- Continue to get rid of non-user friendly data on frontend
- Replace IDs with Names, create Name fields in sage-node

Learning Metrics

- Uploading sb2 project file to server upon submission
- Retrieving file from server to display metrics
- Determining objective points and completion