

MICHIGAN STATE

UNIVERSITY

Alpha Presentation

General RAte Calculation IDE

The Capstone Experience

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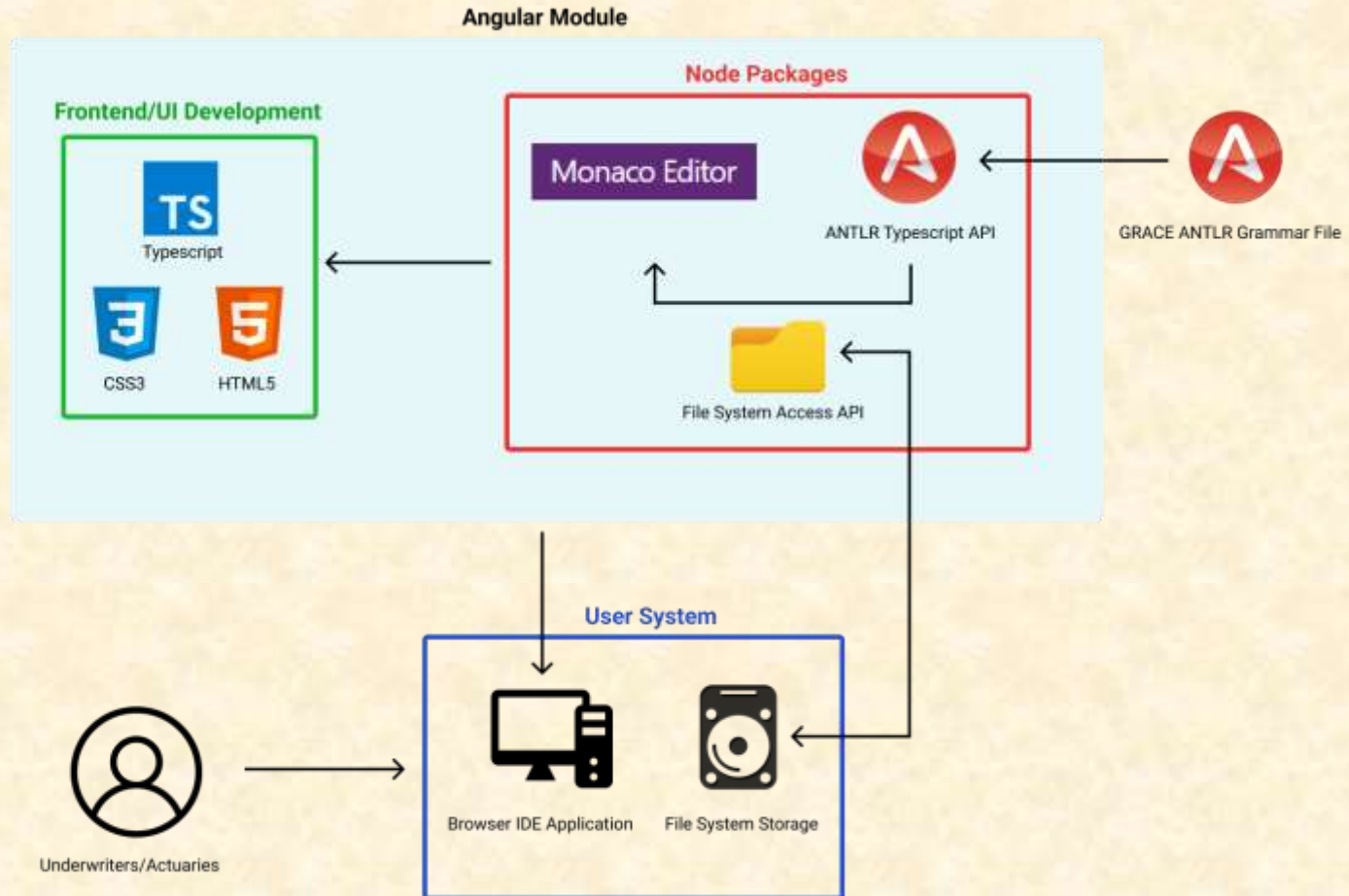
*From Students...
...to Professionals*

Project Overview

- Browser-based editor for General Rate Calculation Environment language (GRACE)
- Helpful editor features like code coloring and error highlighting
- File and folder navigation similar to native IDEs



System Architecture



Error Checking

```
7 BaseSeverity[*N, *D] = {
8   50.0, 55.0, 120.0, 1000.0,
9   00.0, 05.0, 140.0, 1200.0
10 };
11
12 Utilization[*D] = [ 1.58, 0.75, 0.11, 0.03 ];
13 Severity[*N, *D] = BaseSeverity[*N, *D] * Utilization[*D]
14
15 &Homework : { "Hw1", "Hw2", "Hw3", "Hw4" };
16
17
18 &Student : { "John", "Bob", "Alice" };
19
20 sum : (#n1:Integer, #n2:Integer) -> Integer
21 {
22   #n1 + #n2
23 };
24
25 HM_score : Integer[&Student, &Homework];
26 Final_score_student : Integer[&Student];
27 HM_score[*student, *hw] = {
28   23, 18, 22, 24,
29   22, 22, 19, 25,
30   23, 0, 16, 17
31 };
32 }
```

Mismatched input '&Homework' expecting ['AND', 'OR', 'IMPLIES', 'IF AND ONLY IF', '&...', '<...', '>...']

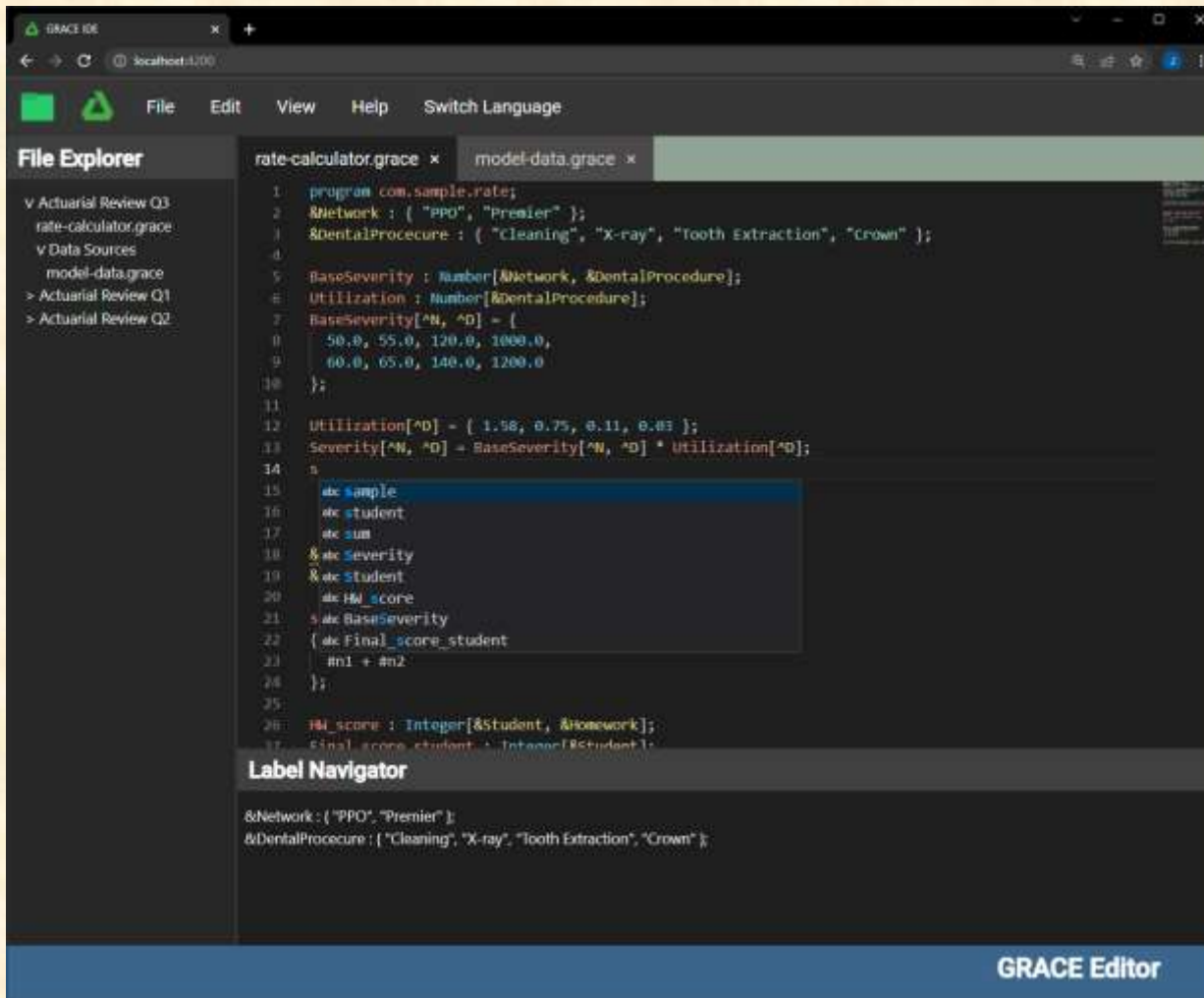
Label Navigator

```
&Network : { "PPO", "Premier" };
&DentalProcedure : { "Cleaning", "X-ray", "Tooth Extraction", "Crown" };
```

GRACE Editor



IntelliSense Completion



The screenshot shows the GRACE IDE interface. The main editor window displays a GRACE script with the following code:

```
1 program com.sample.rate;
2 &Network : { "PPO", "Premier" };
3 &DentalProcedure : { "Cleaning", "X-ray", "Tooth Extraction", "Crown" };
4
5 BaseSeverity : Number[&Network, &DentalProcedure];
6 Utilization : Number[&DentalProcedure];
7 BaseSeverity[^N, ^D] = [
8   50.0, 55.0, 120.0, 1000.0,
9   60.0, 65.0, 140.0, 1200.0
10 ];
11
12 Utilization[^D] = [ 1.98, 0.75, 0.11, 0.03 ];
13 Severity[^N, ^D] = BaseSeverity[^N, ^D] * Utilization[^D];
14
15
16
17
18
19
20
21
22 { &Final_score_student
23   #n1 + #n2
24 };
25
26 #H_score : Integer[&Student, &Homework];
27 #Final_score_student : Integer[&Student];
```

An IntelliSense completion menu is open over line 15, showing the following options:

- &x sample
- &x student
- &x sum
- &x Severity
- &x Student
- &x H_score
- &x BaseSeverity

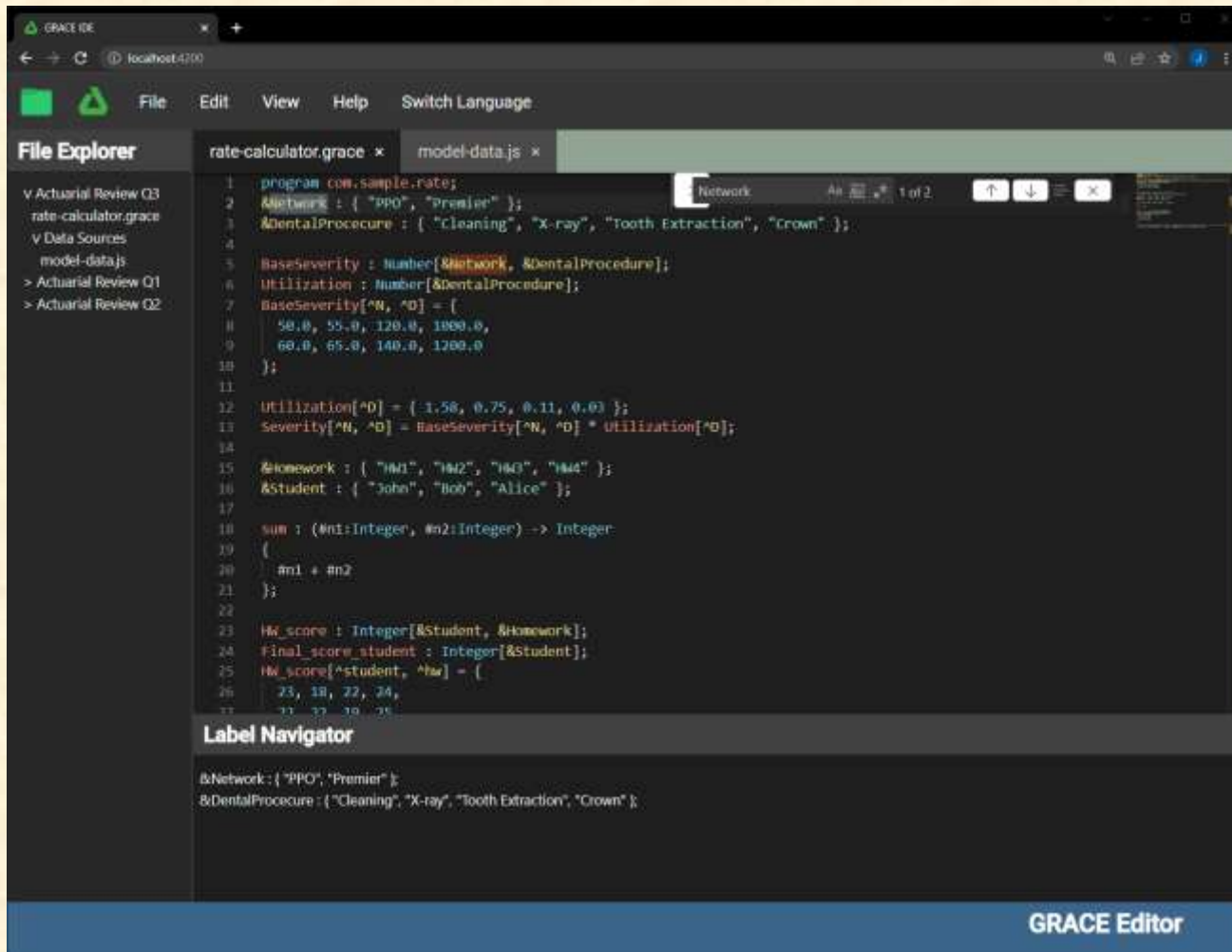
The Label Navigator at the bottom shows the following definitions:

```
&Network : { "PPO", "Premier" };
&DentalProcedure : { "Cleaning", "X-ray", "Tooth Extraction", "Crown" };
```

The GRACE Editor logo is visible in the bottom right corner of the IDE window.



Code Navigation/Refactoring



```
1 program con.sample.rate;
2 &Network : { "PPO", "Premier" };
3 &DentalProcedure : { "Cleaning", "X-ray", "Tooth Extraction", "Crown" };
4
5 BaseSeverity : Number[&Network, &DentalProcedure];
6 Utilization : Number[&DentalProcedure];
7 BaseSeverity["N", "D"] = [
8   50.0, 55.0, 120.0, 1800.0,
9   60.0, 65.0, 140.0, 1700.0
10  ];
11
12 utilization["D"] = { 1.50, 0.75, 0.11, 0.03 };
13 Severity["N", "D"] = BaseSeverity["N", "D"] * utilization["D"];
14
15 &Homework : { "HW1", "HW2", "HW3", "HW4" };
16 &Student : { "John", "Bob", "Alice" };
17
18 sum : (#n1:Integer, #n2:Integer) -> Integer
19 {
20   #n1 + #n2
21 };
22
23 HW_score : Integer[&Student, &Homework];
24 final_score_student : Integer[&Student];
25 HW_score["student", "hw"] = [
26   23, 18, 22, 24,
27   21, 22, 30, 25
28  ];
```

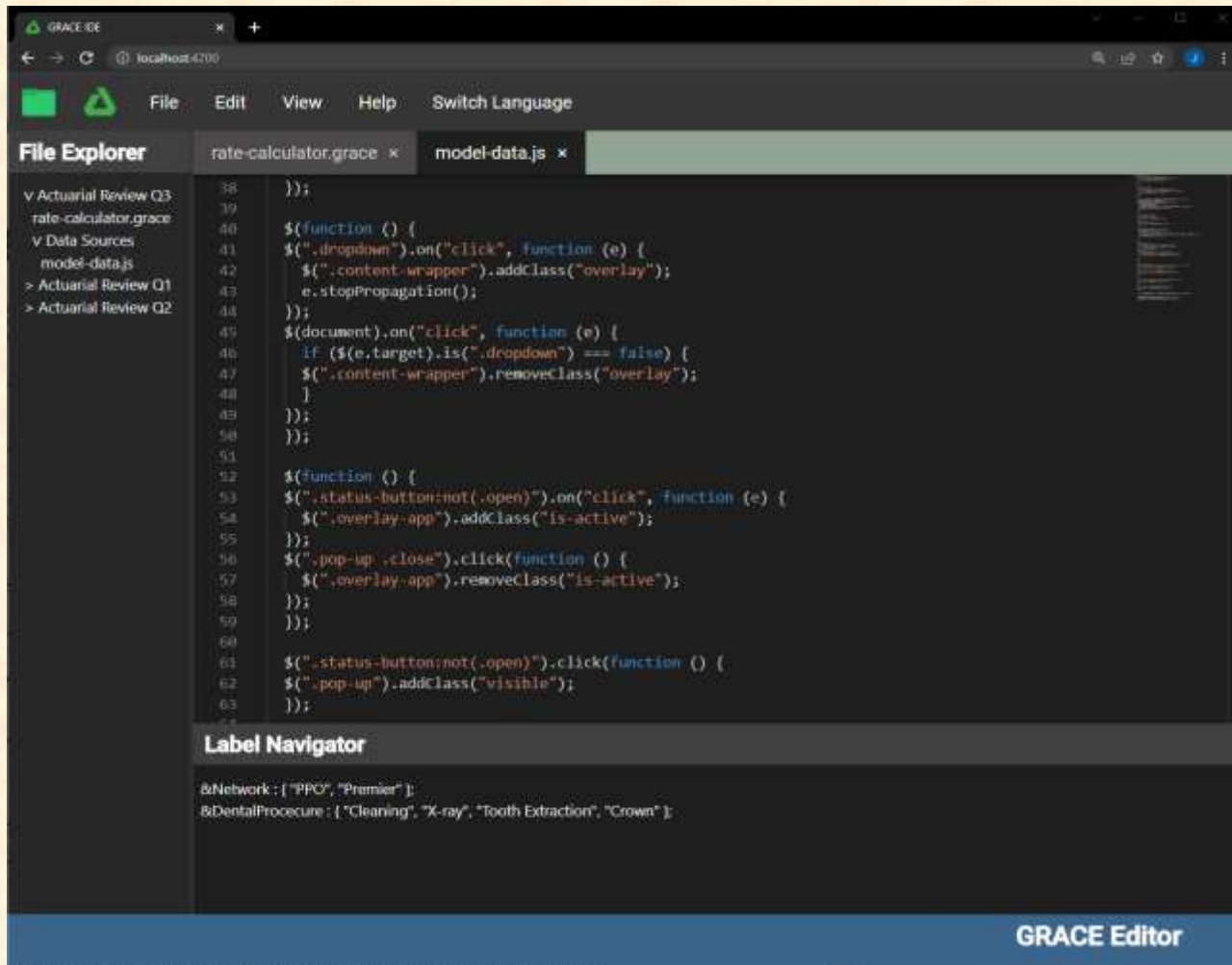
Label Navigator

```
&Network : { "PPO", "Premier" };
&DentalProcedure : { "Cleaning", "X-ray", "Tooth Extraction", "Crown" };
```

GRACE Editor



Using Alternate Language (JavaScript)



```
38     });
39
40     $(function () {
41     $(".dropdown").on("click", function (e) {
42         $(".content-wrapper").addClass("overlay");
43         e.stopPropagation();
44     });
45     $(document).on("click", function (e) {
46         if ($(e.target).is(".dropdown") === false) {
47             $(".content-wrapper").removeClass("overlay");
48         }
49     });
50     });
51
52     $(function () {
53     $(".status-button:not(.open)").on("click", function (e) {
54         $(".overlay-app").addClass("is-active");
55     });
56     $(".pop-up .close").click(function () {
57         $(".overlay-app").removeClass("is-active");
58     });
59     });
60
61     $(".status-button:not(.open)").click(function () {
62     $(".pop-up").addClass("visible");
63     });
64     });
```

Label Navigator

```
BNetwork: ["PPO", "Premier"];
BDentalProcedure: ["Cleaning", "X-ray", "Tooth Extraction", "Crown"];
```

GRACE Editor



What's left to do?

- Identify and display more GRACE errors
- Improve IntelliSense completions
- Finish back end for the label navigator and file tree
- Implement the functionality of remaining menu bar options



Questions?

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