PAT 4/11/23, Sam Cohen

```
shoutGreeting names =
  concatWith " " (map uppercase "hello:names)

assert (shoutGreeting [ "people"
                      , "tech"
                      , "seminar"]
          == "HELLO PEOPLE TECH SEMINAR")
```

```
shoutGreeting names =
  concatWith " " (map uppercase "hello:names)

assert (shoutGreeting [ "people"
                      , "tech"
                      , "seminar"]
          == "HELLO PEOPLE TECH SEMINAR")
```

```
shoutGreeting names =
  concatWith " " (map uppercase "hello":names)

assert (shoutGreeting [ "people"
                      , "tech"
                      , "seminar"]
          == "HELLO PEOPLE TECH SEMINAR")
```

```
shoutGreeting names =
  concatWith " " (map uppercase "hello":names)

assert (shoutGreeting [ "people"
                      , "tech"
                      , "seminar"]
          == "HELLO PEOPLE TECH SEMINAR")
```

```haskell
shoutGreeting names =
  concatWith " " (map uppercase "hello":names)

assert (shoutGreeting [ "people"
                      , "tech"
                      , "seminar"]
          == "HELLO PEOPLE TECH SEMINAR")
```

```
patPrez.hs:7:23: error:
    • Couldn't match type ‘Char’ with ‘[Char]’
      Expected: [String]
        Actual: String
    • In the second argument of ‘concatMap’, namely ‘"hello, "’
      In the first argument of ‘(:)’, namely
        ‘concatMap uppercase "hello, "’
      In the expression: concatMap uppercase "hello, " : names
  |
7 |   concatMap uppercase "hello, ":names
  |                       ^^^^^^^^^
```

```haskell
shoutGreeting names =
  concatWith " " (map uppercase "hello":names)

assert (shoutGreeting [ "people"
                      , "tech"
                      , "seminar"]
          == "HELLO PEOPLE TECH SEMINAR")
```

```
patPrez.hs:7:23: error:
    • Couldn't match type ‘Char’ with ‘[Char]’
      Expected: [String]
        Actual: String
    • In the second argument of ‘concatMap’, namely ‘"hello, "’
      In the first argument of ‘(:)’, namely
        ‘concatMap uppercase "hello, "’
      In the expression: concatMap uppercase "hello, " : names
  |
7 |   concatMap uppercase "hello, ":names
  |                       ^^^^^^^^^
```

```haskell
shoutGreeting names =
  concatWith " " (map uppercase ("hello":names))

assert (shoutGreeting [ "people"
                      , "tech"
                      , "seminar"]
          == "HELLO PEOPLE TECH SEMINAR")
```

```
patPrez.hs:7:23: error:
    • Couldn't match type ‘Char’ with ‘[Char]’
      Expected: [String]
        Actual: String
    • In the second argument of ‘concatMap’, namely ‘"hello, "’
      In the first argument of ‘(:)’, namely
        ‘concatMap uppercase "hello, "’
      In the expression: concatMap uppercase "hello, " : names
  |
7 |   concatMap uppercase "hello, ":names
  |                       ^^^^^^^^^
```

Two goals of CSS:

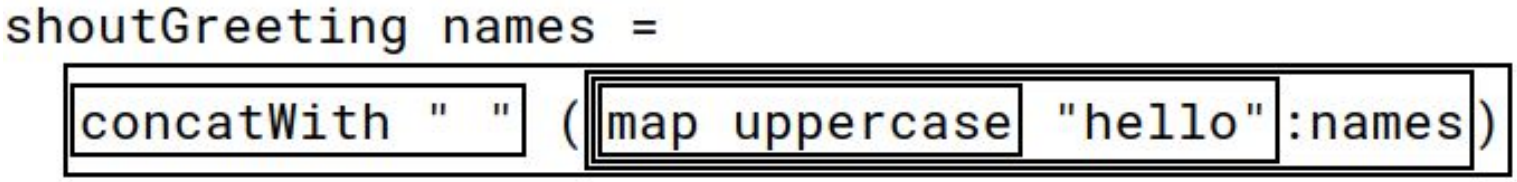
- *Rich Styles*: Code representations should use color, but also grouping, hierarchy, and meaningful typography.

Two goals of CSS:

- *Rich Styles*: Code representations should use color, but also grouping, hierarchy, and meaningful typography.

- *Configurable Styles*: Visual representation should be user or task controlled.

Example: Expose program structure



Example: Expose program structure

```
shoutGreeting names =
  concatWith " " (map uppercase "hello":names)
```

```
shoutGreeting names =
  concatWith " " (map uppercase ("hello":names))
```

Example: Expose type information

```
shoutGreeting names =
  concatWith " " ( map uppercase "hello" :names )
```

Example: Expose type information

```
shoutGreeting names =
  concatWith " " (map uppercase "hello":names)
```

```
shoutGreeting names =
  concatWith " " (map uppercase ("hello":names))
```

Example: Task specific highlights

Task 1: Syntactical Error

```
shoutGreeting names =
  concatWith " " (map uppercase "hello:names)

assert (shoutGreeting [ "people"
                      , "tech"
                      , "seminar"]
          == "HELLO PEOPLE TECH SEMINAR")
```

Example: Task specific highlights

Task 1: Syntactical Error

```
shoutGreeting names =
  concatWith " " (map uppercase "hello:names)

assert (shoutGreeting [ "people"
                      , "tech"
                      , "seminar"]
          == "HELLO PEOPLE TECH SEMINAR")
```

Task 2: Type Error

```
shoutGreeting names =
  concatWith " " (map uppercase "hello":names)
```

User Controlled, Language Agnostic

```
.HsApp {
  border-width: 2px;
  padding: 2px;
}
```

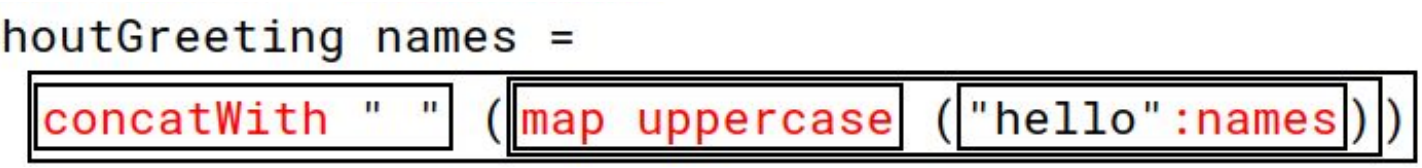
```
shoutGreeting names =
  concatWith " " (map uppercase ("hello":names))
```

User Controlled, Language Agnostic

```
.HsApp {
  border-width: 2px;
  padding: 2px;
}
```

```
.HsVar {
  color: red;
}
```

```
shoutGreeting names =
  concatWith " " (map uppercase ("hello":names))
```



User Controlled, Language Agnostic

```
.HsApp {
  border-width: 2px;
  padding: 2px;
}
```

```
.HsVar {
  color: red;
}
```

```
.HsVar String List {
  color: blue;
}
```

```
shoutGreeting names =
  concatWith " " (map uppercase ("hello":names))
```

```
shoutGreeting names =
  concatWith " " (map uppercase ("hello":names))
```

```
shoutGreeting names =
  concatWith " " (map uppercase ("hello":names))
```

Direction

- *Short term:* Conduct a survey to evaluate our visualizations and interactions

- *Medium term:* Continue to build-out our prototype, use static visualizations in CS 223 course materials

- *Long term:* Dynamic visualizations and editor integration

Direction

Thank you!

- *Short term:* Conduct a survey to evaluate our visualizations and interactions

- *Medium term:* Continue to build-out our prototype, use static visualizations in CS 223 course materials

- *Long term:* Dynamic visualizations and editor integration