

Lecture 23: Lists

CS 51G
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Test Programs

- Questions on Test Programs
 - Be sure to name them properly
 - Lost a lab 6 because of naming issues

For Loops

- `for (1..10) do { action }`
 - Called a range: `(m .. n)`
 - `(2 .. 9).reversed` gives range in reverse order

Lists

- Linear sequence of elements
- Must say what kind of element held in list:
 - `var scores: List[[Number]]`
 - `var names: List [[String]]`
 - `var pictures: List [[Graphic2D]]`

Creating Lists

- Creating lists of strings:
 - `var start: List[String] := emptyList[String]`
 - `var vowels: List[String] := list[String] ["a", "e", "i", "o", "u"]`
 - type parameter optional in list constructor
 - Better error checking if leave it in.
- Can also create from ranges:
 - `var scores: List[Number] := list[Number] (1..100)`

Accessing Elements

- Example:
 - `var vowels: List[String] := list[String] ["a", "e", "i", "o", "u"]`
 - `def first: String = vowels.at(1)`
 - Numbering starts at 1 (Java & Python start at 0)
 - `def last: String = vowels.at(5)`
 - Can use like range in for loops:
 - ```
for (vowels) do {letter: String ->
 print (letter)
}
```

# Examples

- Slides

- Actions associated with buttons

- <http://www.cs.pomona.edu/classes/cs051G/demos/FacultySlides/FacultySlides.grace>

- Drawing

- No actions associated w/GUI items

- Only recognize mouse actions on canvas

- <http://www.cs.pomona.edu/classes/cs051G/demos/DrawingList/DrawingList.grace>

# Changing Lists

- Add elements:
  - `add` (*at beginning*), `addLast`, `addFirst`
- Remove elements:
  - `removeFirst`, `removeLast`, `removeAt(n)`, `remove(elt)`
- Update elements
  - `at(i) put(newElt)`
- Miscellaneous: `++`, `contains`, `reverse`
  - compare with `reversed!`



# List Operations

- See documentation. Includes:

Questions?