Programming Techniques 2024-2025

Lecture 4: Linked list exercise

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Step 1: Write a module named `slist` saved in `slist.f90` that contains

- Type `Cell` consisting of an allocatable string "`data`" and a pointer to a `Cell` "`next`"
- Type `SortedList` that contains an integer `length` and a pointer to a cell named `head`
- Subroutine `extend` that takes a `SortedList` and a string, creates a new `Cell`, adds it to the list so that the cells are sorted based on the string's first letter, and increments `length`.
- Subroutine `empty_list` that takes a list and empties it taking care to deallocate memory correctly
- Function `pop` that returns the last cell of the list and removes it
- Recursive function `print_forward` that prints all the strings in the list from last to first
- Recursive function `print_reverse` that prints all strings in the list from first to last

Step 2: Write a program in a separate file that uses the `SortedList` module, creates a sorted list, adds the strings:

river, spark, melody, whisper, canyon, drift, lantern, echo, quartz, and breeze

to it, and prints the list in ascending and descending order.