COMPUTER SCIENCE

LESSON 32+33, TUESDAY JAN 23RD + THURSDAY JAN 24TH

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THIS WEEK IN CS AND STEM

- Tesla makes good on their deals – solar panel roofing tiles available for installation

  - https://futurism.com/teslas-solar-roofing-tiles-begun-production-buffalo-factory/

- University of Cambridge produces a BPV that's 5x more efficient than current bio-solar cells

  - https://futurism.com/genetically-modified-algae-key-tomorrows-bio-solar-cells/

  - Not suited for large scale productions, but ideal for small scale use (ie. homes, car-charging, etc)

UPCOMING TALKS, DISCUSSIONS, AND OTHER THINGS

- ROM connects (Free): **Articulating Dinosaurs (**Sunday, January 28, 2-3pm), (**2018 International Holocaust Remembrance Day Program** Sunday, January 28, 4-5pm)

  - https://www.rom.on.ca/en/whats-on/rom-connects

- AstroTours: Magnetars: Nature at its extremes

  - Feb 1, 8-10:30 pm, Free http://www.astro.utoronto.ca/astrotours/?page_id=392

- ASX 15th Annual Symposium "Into the Unknown: The Future of Space Exploration"

  - Feb 2, 6-9pm , Free for students, $10 for the general public (link to long)

- 2nd Annual Franklin Forum on Artificial Intelligence

  - Feb 7th, 1-6pm, Free (link too long)

ASSIGNMENT 11

- CCC 2017 problem 3 (S3: Nailed it!). Output and input should be the same as asked in the problem. Include comments and docstrings where necessary.

- Include a secondary version of the working assignment that includes:
  - Generalized I/O: use argparse to get input and output file names and write the output information to the output file. Assume the input file has some straight-forward structure.
  - More detailed output: instead of numbers, add some short explanation (ex. "Tudor can make a fence of length x at height y).

- Due Tuesday Jan 30, 2018 by 11:59pm via email to woodford@cita.utoronto.ca

MORE ABOUT LISTS AND ARRAYS

- So far, we've been using and depending on lists – and only in 1 dimension.

- There is another type of storage for information in this way, called arrays. How are these different?

MORE ABOUT LISTS AND ARRAYS

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- There is another type of storage for information in this way, called arrays. How are these different?

  - There isn't a whole lot of difference. Python has core lists (what we've been using). Arrays in python are a data structure in the numpy package, which is incredibly powerful and very userful for scientific computing in particular
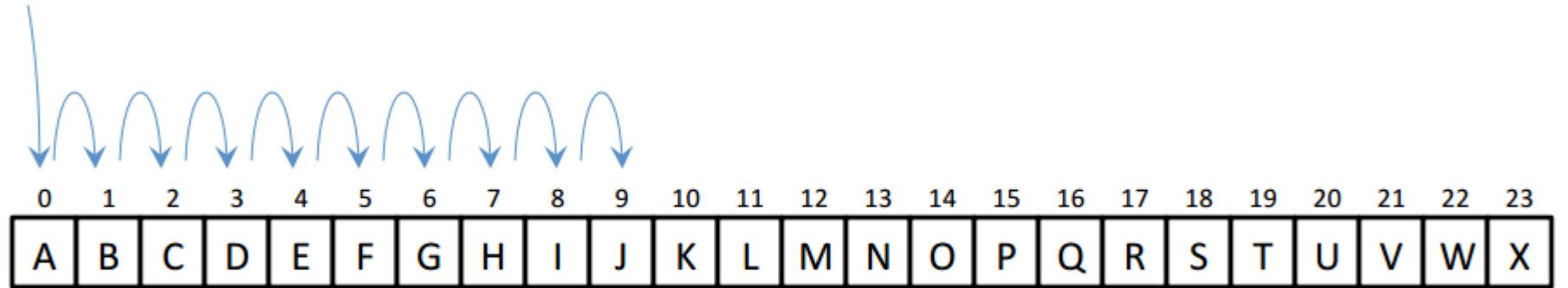
LET'S COMPARE

- We'll refresh our memory on multidimension lists and their manipulation while learning about the capabilities of the NumPy package.
  - Lecture32_33_nDarrays.ipynb

LINEAR AND BINARY SEARCHES

- We've done linear searches already – where we start at one end of a list and look for an element.

- Binary searches require that the list is already sorted, and starts in the middle of the list. This means that if the middle element isn't what you're looking for, it's easy to determine which half of the list you need to search to find it.
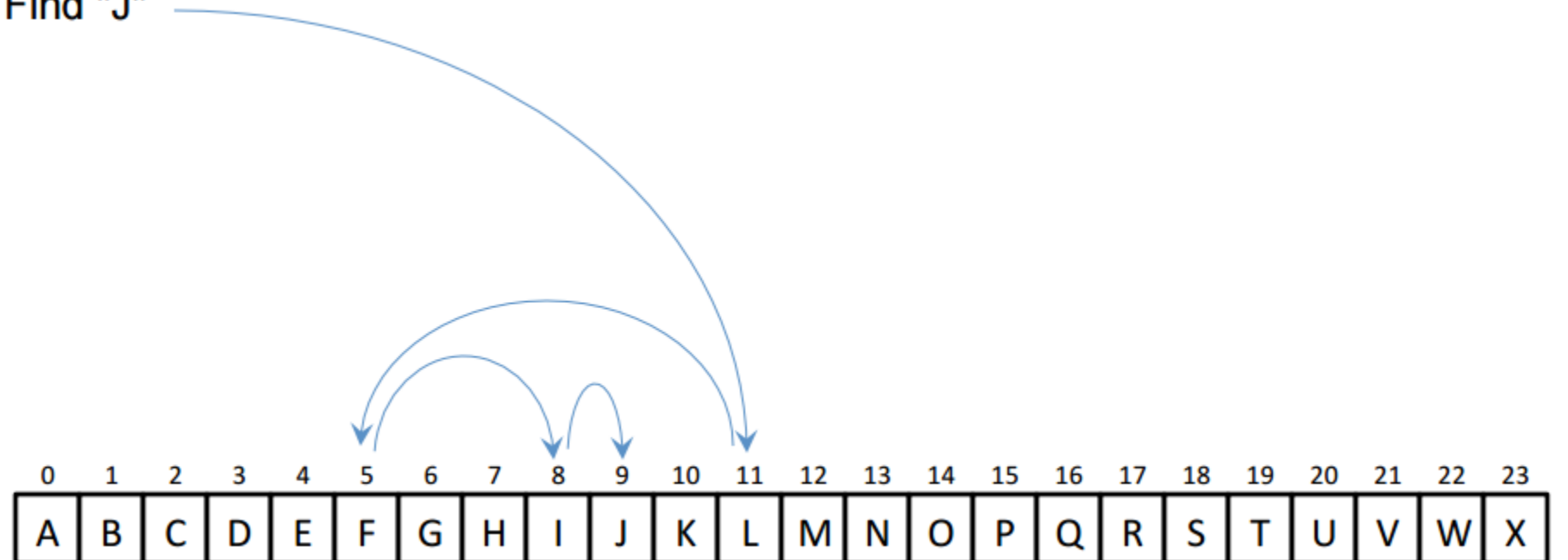
- Linear Search

- Binary Search

LET'S PRACTICE:

- Open Lecutre32_33_searches.ipynb for some practice with linear and binary searches

GROUP PRACTICE

- CCC 2017 Problems 1 and 2– S1: Sum game, S2: High Tide, Low Tide

REFERENCES

- http://www.physics.nyu.edu/pine/pymanual/html/chap3/chap3_arrays.html

- http://www.numpy.org/

- https://www.geeksforgeeks.org/linear-search-vs-binary-search/