Student Conduct during Examinations

- Each examination candidate must be prepared to produce, upon the request of the invigilator or examiner, his or her UBCcard for identification.
- Examination candidates are not permitted to ask questions of the examiners or invigilators, except in cases of supposed errors or ambiguities in examination questions, illegible or missing material, or the like.
- No examination candidate shall be permitted to enter the examination room after the expiration of one-half hour from the scheduled starting time, or to leave during the first half hour of the examination.
- Examination candidates must conduct themselves honestly and in accordance with established rules for a given examination, which will be articulated by the examiner or invigilator prior to the examination commencing. Should dishonest behaviour be observed by the examiner(s) or invigilator(s), pleas of accident or forgetfulness shall not be received.
- Examination candidates suspected of any of the following, or any other similar practices, may be immediately dismissed from the examination by the examiner/invigilator, and may be subject to disciplinary action:
    - speaking or communicating with other examination candidates, unless otherwise authorized;
    - purposely exposing written papers to the view of other examination candidates or imaging devices;
    - purposely viewing the written papers of other examination candidates;
    - using operating electronic devices to communicate with others or access online resources
- Examination candidates must follow any additional examination rules or directions communicated by the examiner(s) or invigilator(s).

Exam Instructions

- You have 2.5 hours to complete this examination.
- In terms of weight – Programming (roughly 65%), Theory (roughly 35%)
- This is a closed book exam, the only material you are allowed to reference is your **4 pages of printed out or written notes.**
- **You are not allowed to access any other resources online or on your machine**
- You will be turning in two submissions.
    - The first file is a Gradescope quiz submission – this submission has a link to the repo that provides the necessary details for the programming portion. **START HERE.**
    - The second file is a jupyter notebook
        - The file must be runnable by TAs
- Both files must be submitted to Gradescope

PART PROGRAMMING

The Jupyter notebook has detailed instructions but here are the visualizations you are required to create. If there are any discrepancies between the image and the instructions, adhere to the images in this file. You are not required to improve upon any of the visualizations. Just stick to what you see in the images/instructions.

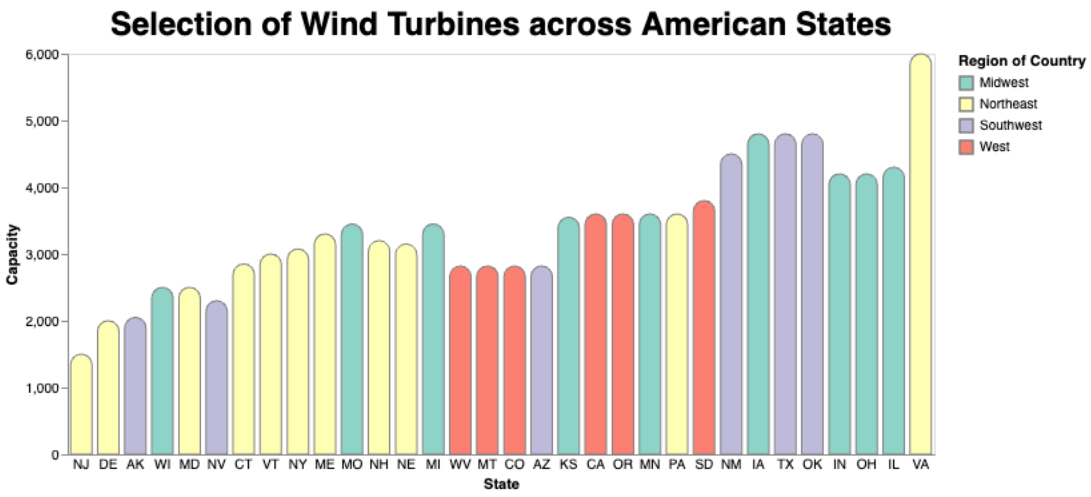
In the repo there is also a quicktime file that shows you what the interaction looks like.
When in doubt of how to do the interaction or if the instructions are unclear, adhere to what you see in the video.

Happy examing y'all.

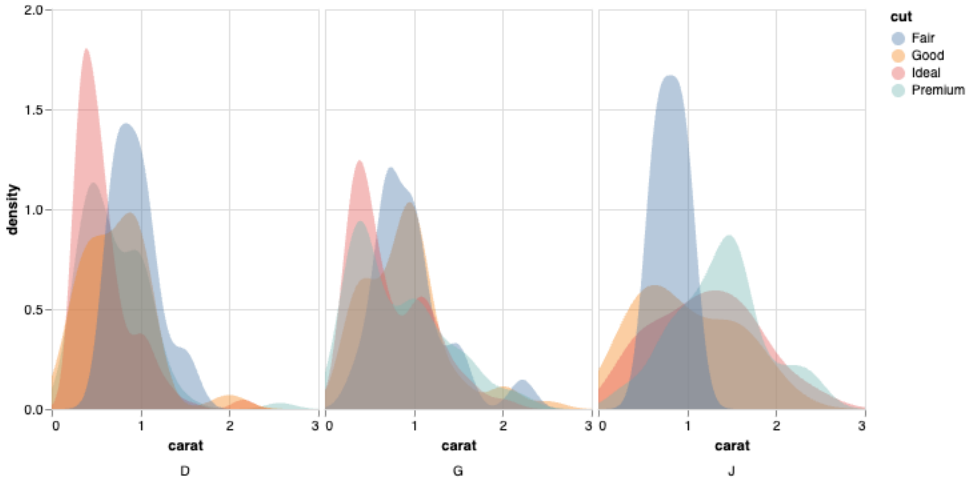
You got this. Remember this is just a way to assess what you have learned over the last 3 months. It is not a reflection of you as an individual. Breathe deep.

Dr. K.

PART 1



PART 2



PART 3

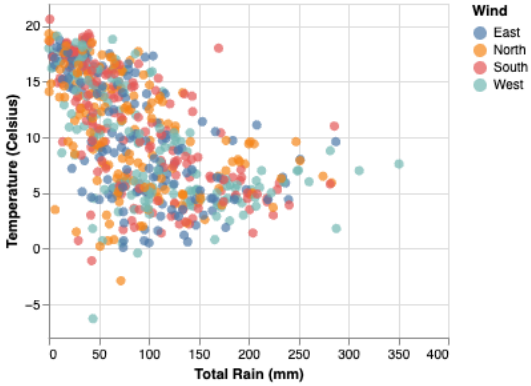
The necessary documentation for mark_arc from the Altair Vega API is on the next page.

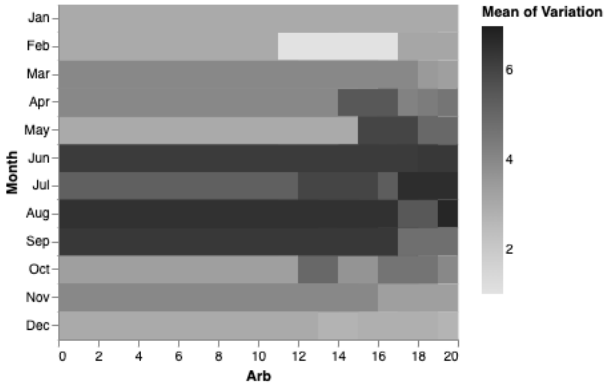
An `arc` mark definition can contain any standard mark properties and the following special properties:

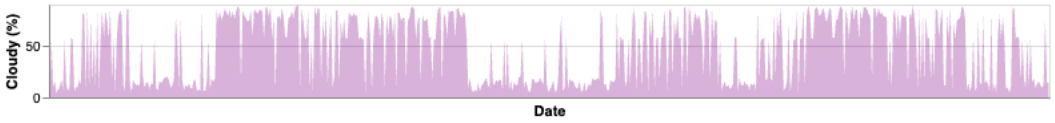
▼ Click to show table

Property	Type	Description
radius	anyOf(`number`, `ExprRef`)	For arc mark, the primary (outer) radius in pixels. For text marks, polar coordinate radial offset, in pixels, of the text from the origin determined by the `x` and `y` properties. **Default value:** `min(plot_width, plot_height)/2`
radius2	anyOf(`number`, `ExprRef`)	The secondary (inner) radius in pixels of arc marks. **Default value:** `0`
innerRadius	anyOf(`number`, `ExprRef`)	The inner radius in pixels of arc marks. `innerRadius` is an alias for `radius2`. **Default value:** `0`
outerRadius	anyOf(`number`, `ExprRef`)	The outer radius in pixels of arc marks. `outerRadius` is an alias for `radius`. **Default value:** `0`
theta	anyOf(`number`, `ExprRef`)	• For arc marks, the arc length in radians if theta2 is not specified, otherwise the start arc angle. (A value of 0 indicates up or "north", increasing values proceed clockwise.) • For text marks, polar coordinate angle in radians.
theta2	anyOf(`number`, `ExprRef`)	The end angle of arc marks in radians. A value of 0 indicates up or "north", increasing values proceed clockwise.
cornerRadius	anyOf(`number`, `ExprRef`)	The radius in pixels of rounded rectangles or arcs' corners. **Default value:** `0`
padAngle	anyOf(`number`, `ExprRef`)	The angular padding applied to sides of the arc, in radians.
radiusOffset	anyOf(`number`, `ExprRef`)	Offset for radius.
radius2Offset	anyOf(`number`, `ExprRef`)	Offset for radius2.
thetaOffset	anyOf(`number`, `ExprRef`)	Offset for theta.
theta2Offset	anyOf(`number`, `ExprRef`)	Offset for theta2.

PART 4







DASHBOARD