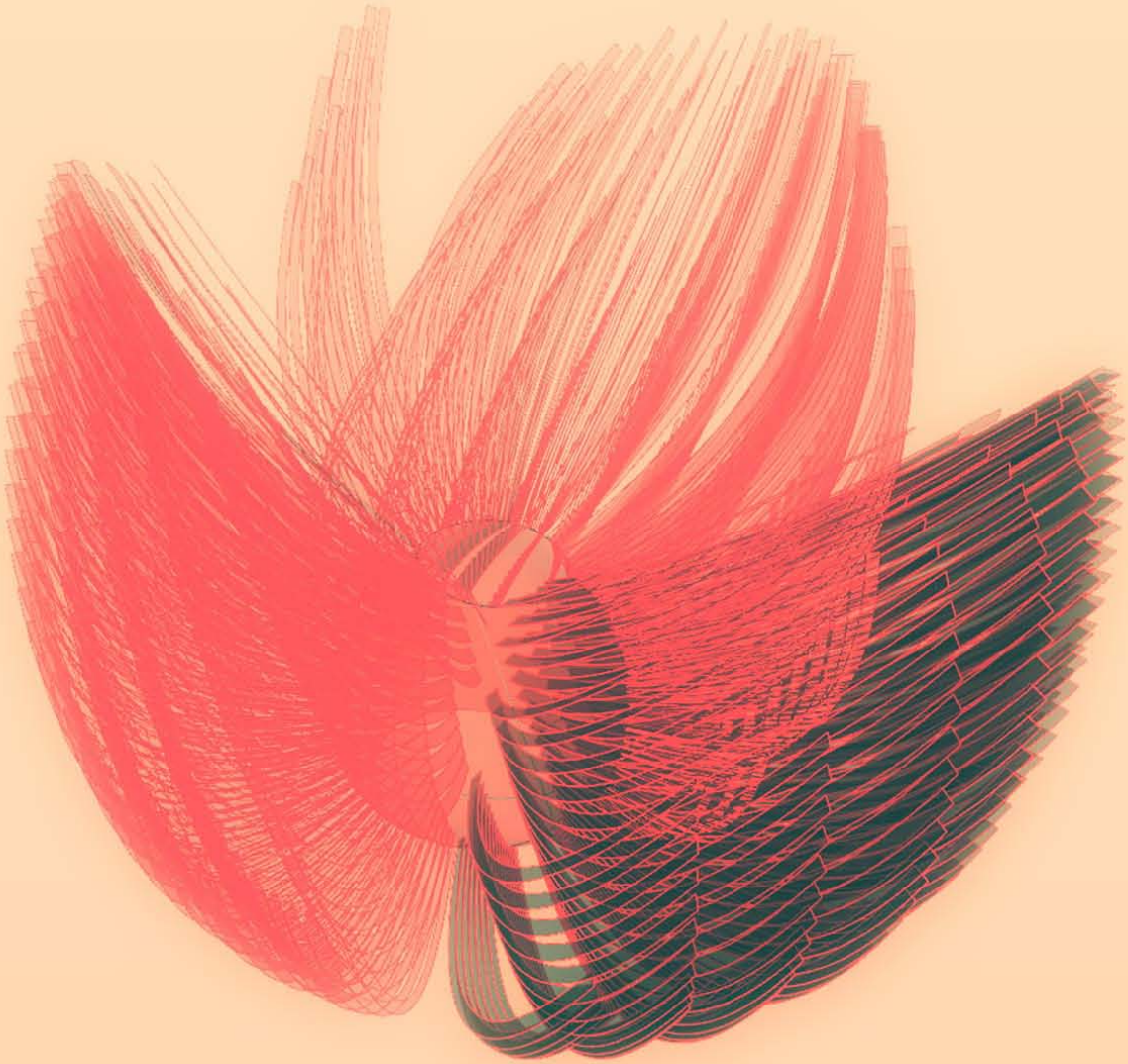
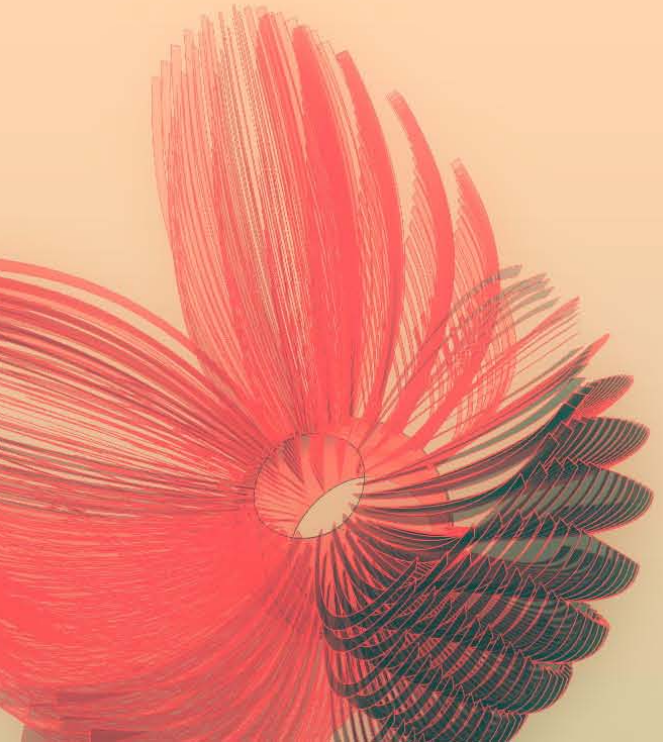


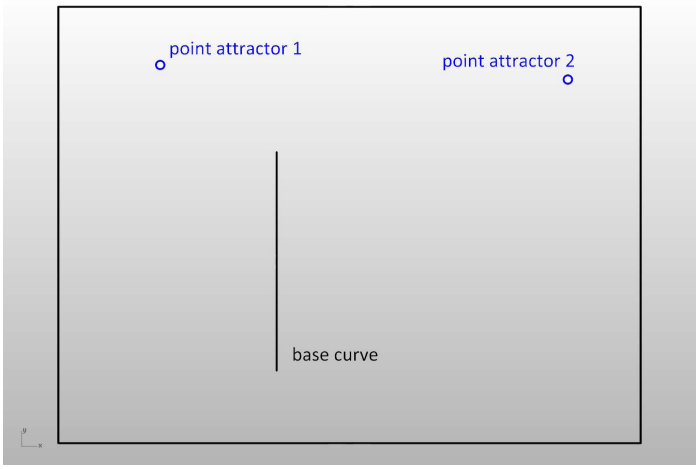


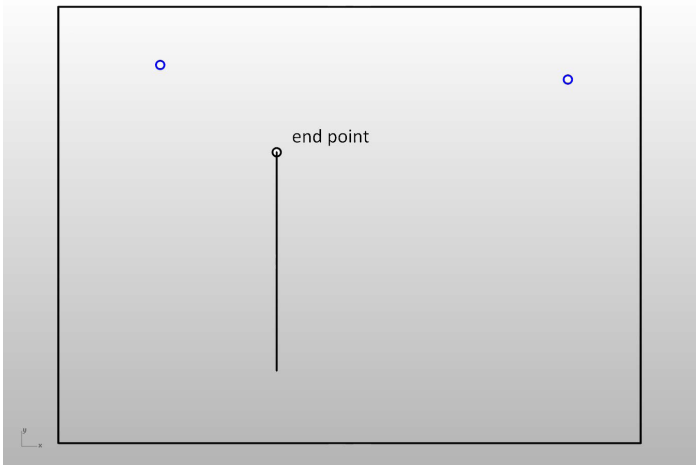
# **GRASSHOPPER** WORKSHOP

**SYRACUSE ARCHITECTURE / APR 10TH 2010 / GH ver 0.6.0059**

**WOO JAE SUNG**

**WS92@CORNELL.EDU · WWW.WOOJSUNG.COM**


point attractor 1
point attractor 2
base curve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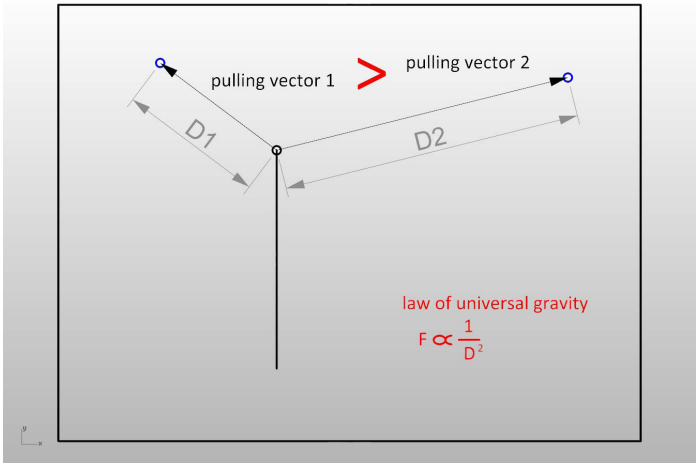
pulling vector 1
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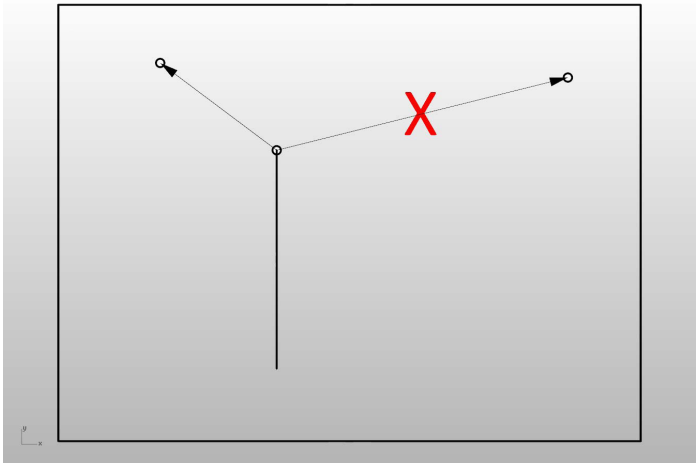
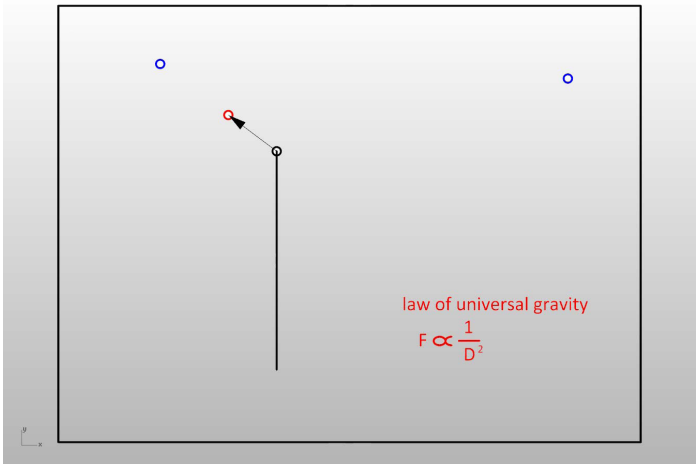
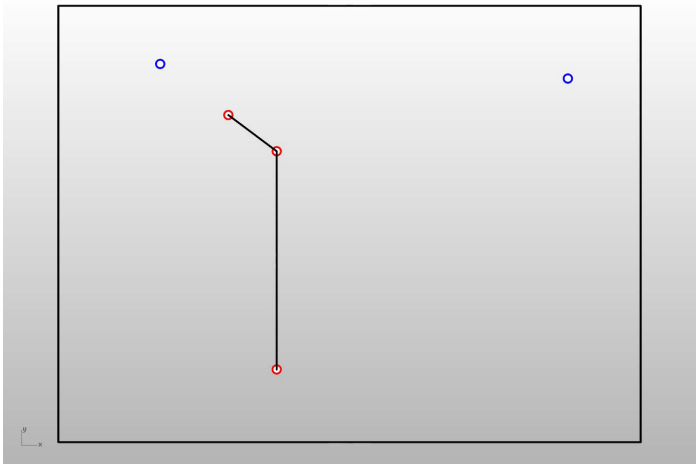
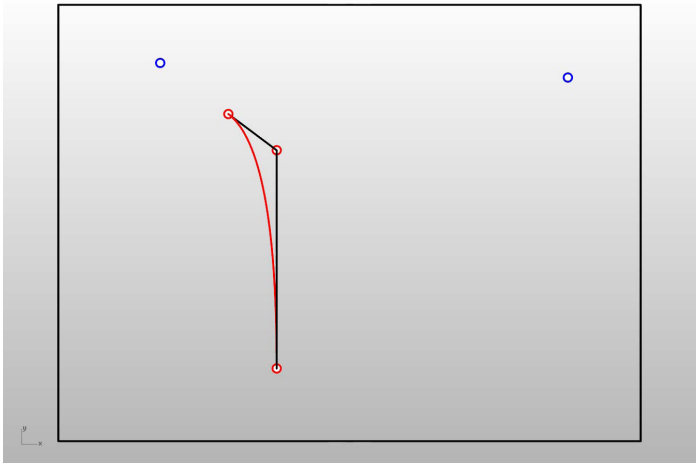
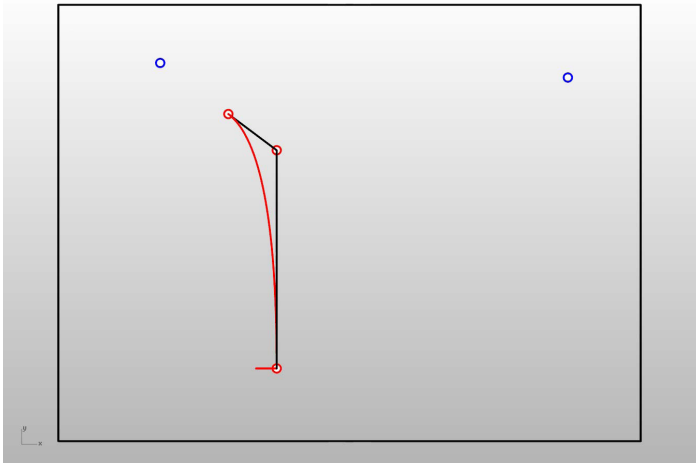
pulling vector 2
D1
D2
law of universal gravity
F ∝ 1/D²

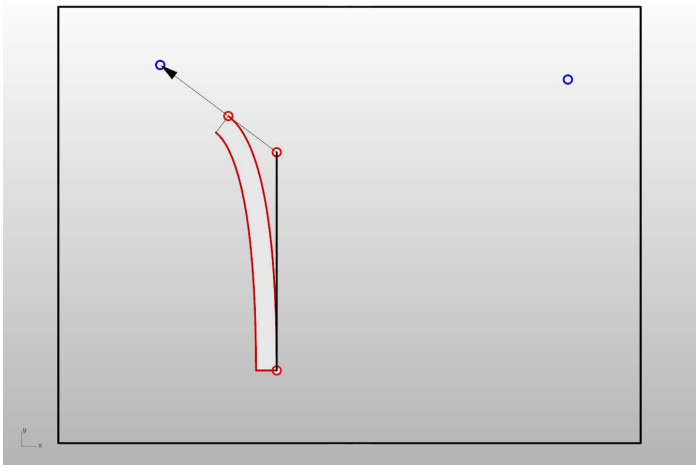

X

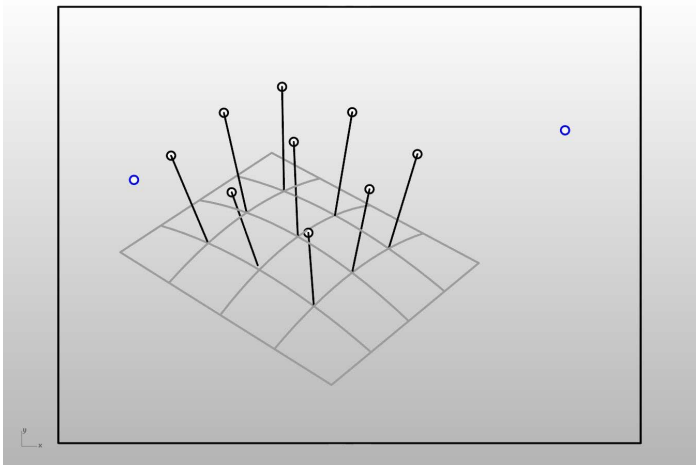

law of universal gravity
F ∝ 1/D²

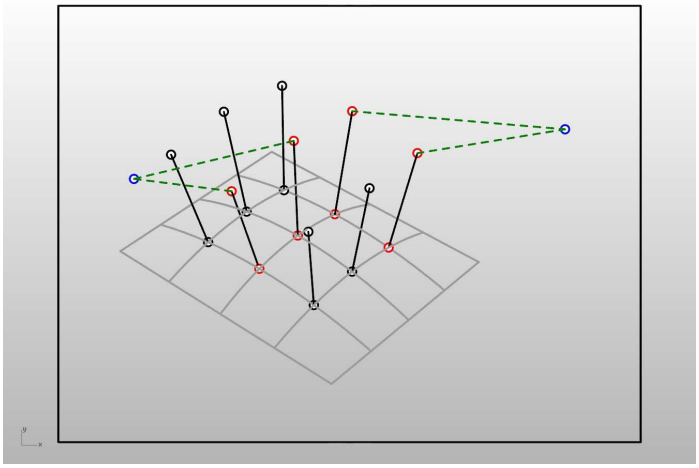


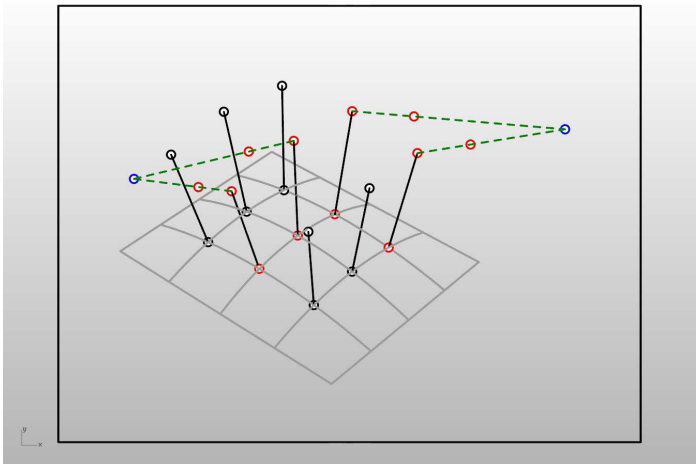


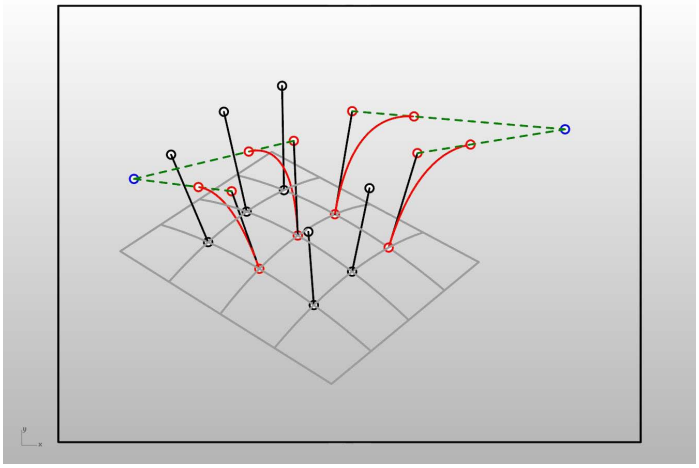




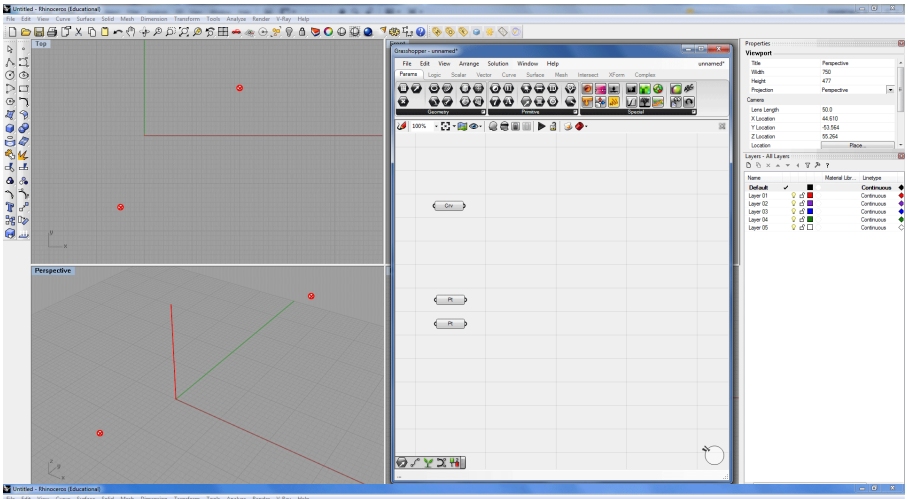




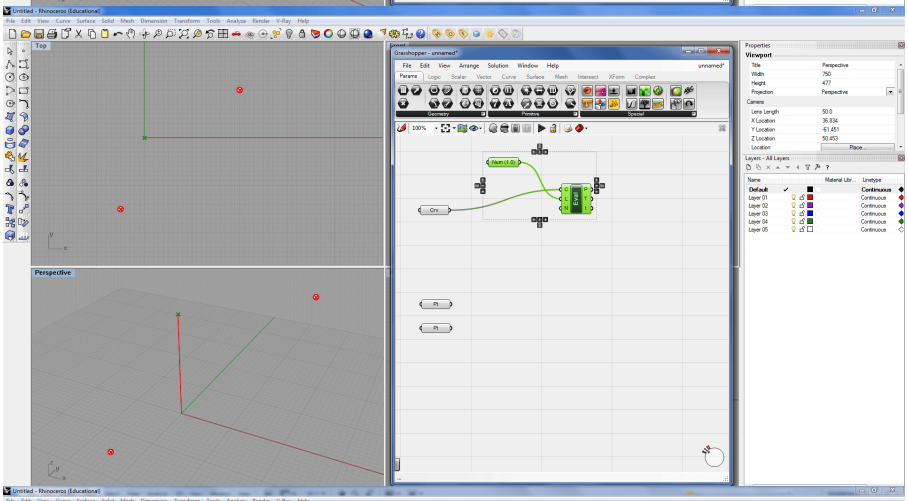




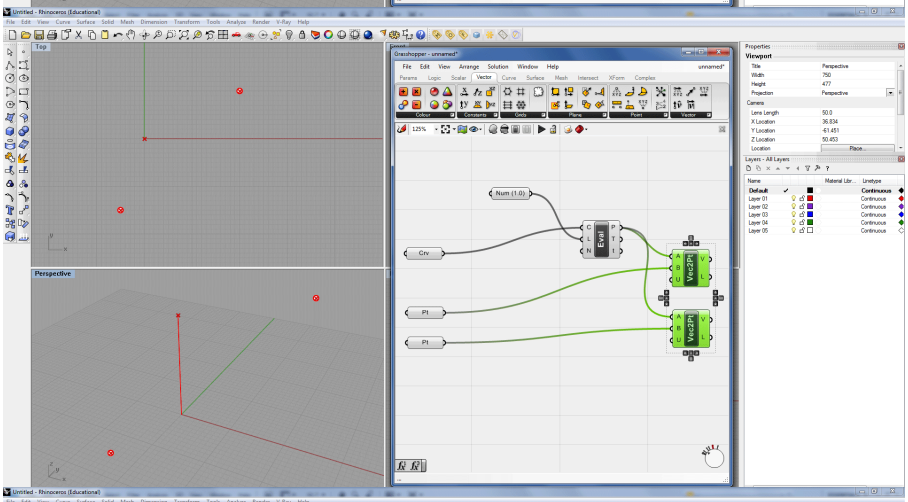
## STEP01



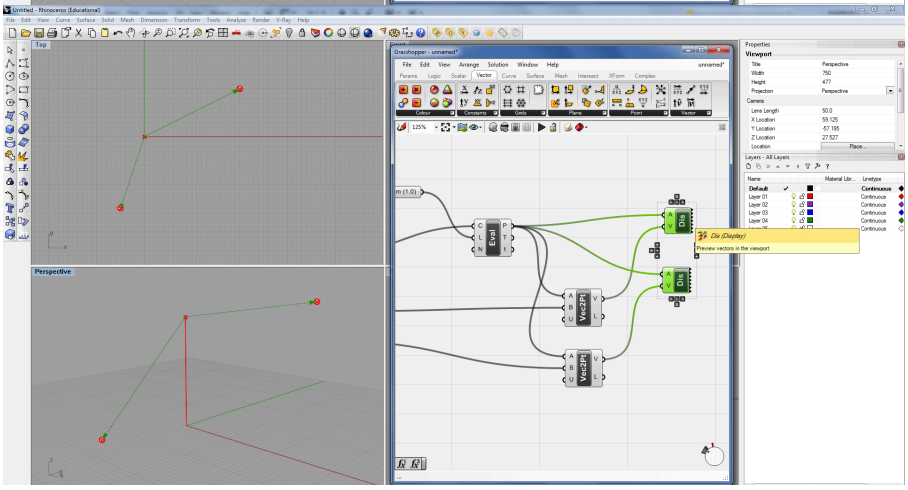
+ 1 BASE CRV / 2 POINT ATTRACTORS



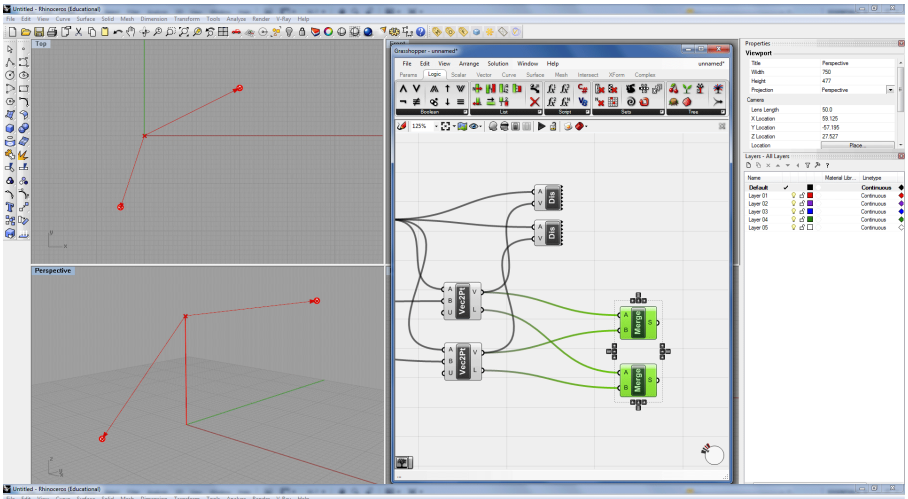
+ GET THE END POINT



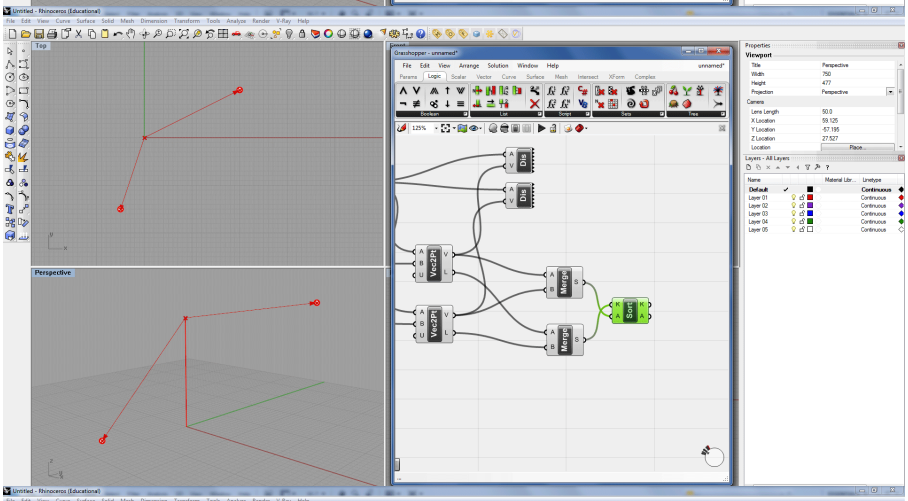
+ GET TWO VECTORS



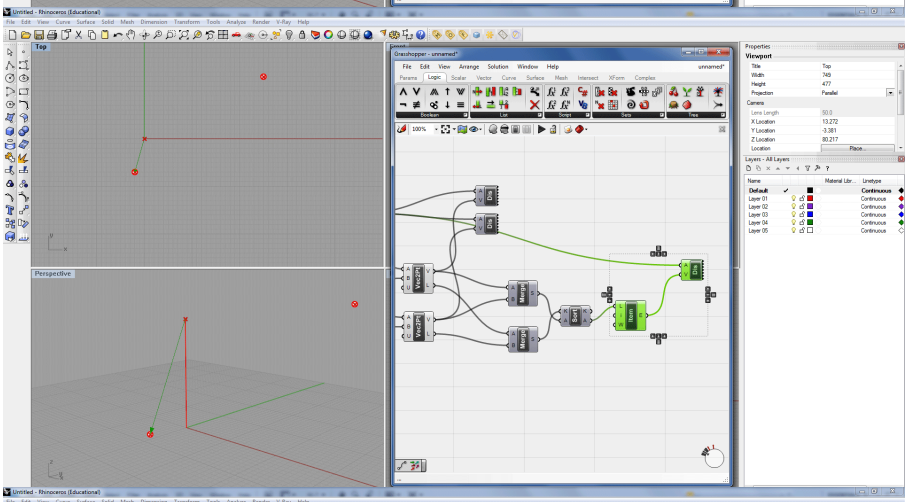
+ CHECK THE DIRECTION OF VECTORS



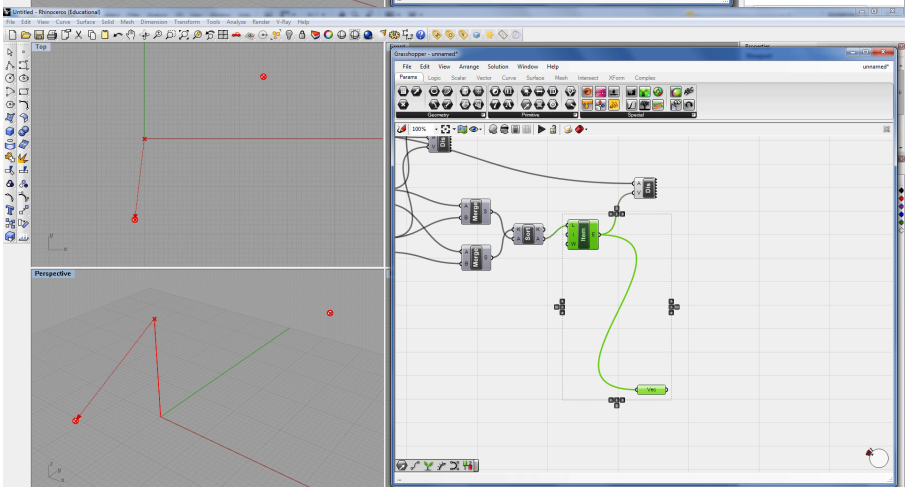
+ MERGE TWO VECTORS TO COMPARE LENGTH



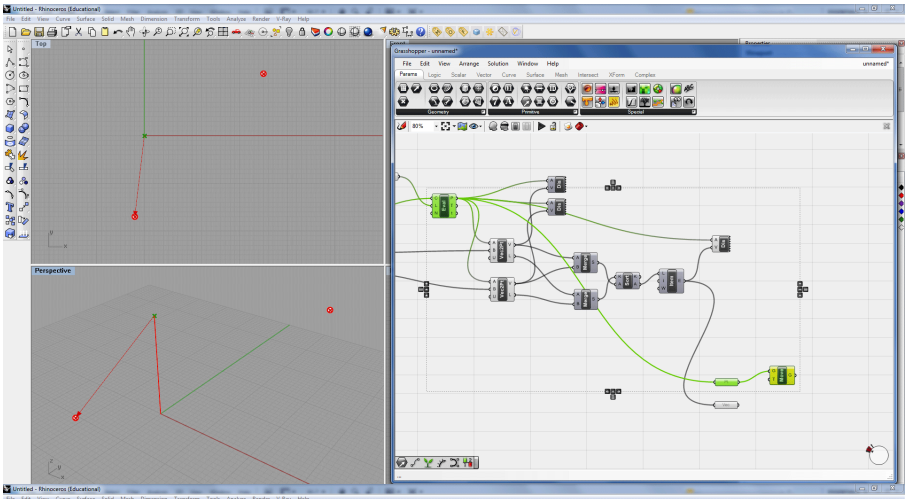
+ SORT VECTORS BY THEIR LENGTH



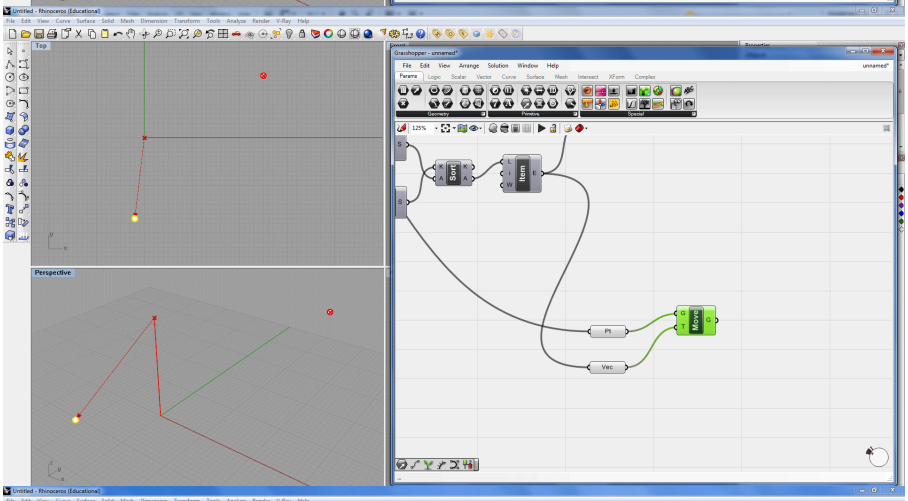
+ CHECK OUT WHICH VECTOR WE GET / WORKING RIGHT?



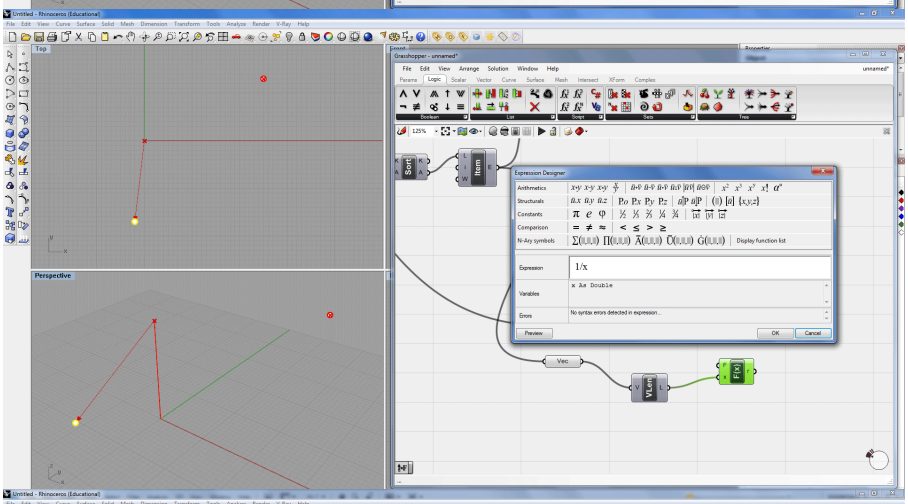
• EXTRACT VECTOR



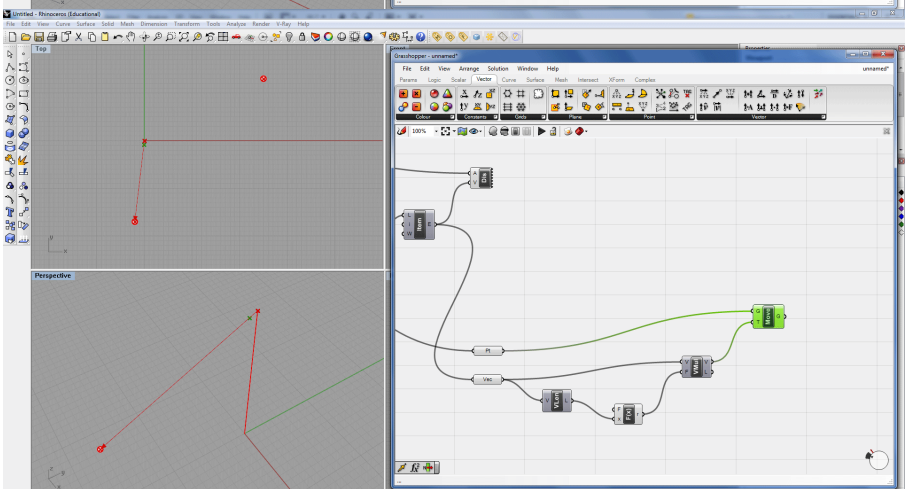
+ EXTRACT THE END POINT TO MOVE



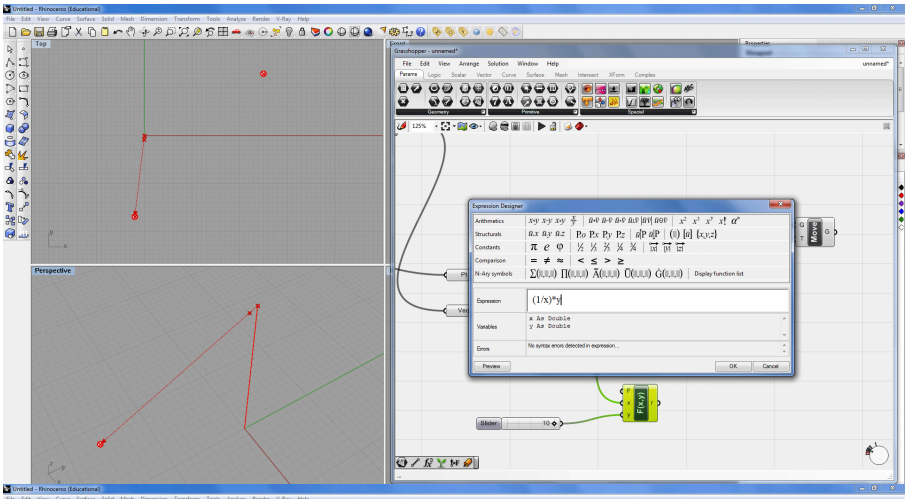
+ MOVE THE END POINT BY THE VECTOR
  - THE POINT MOVES TOO MUCH



+ GET THE LENGTH OF VECTOR
+ GET THE INVERSE NUMBER
  - SIMULATE ‘LAW OF UNIVERSAL GRAVITY’
  - NOTE ; USE 1/X INSTEAD OF 1/X^2 (1/X^2 GIVES TOO SMALL VALUE FOR THIS CASE)



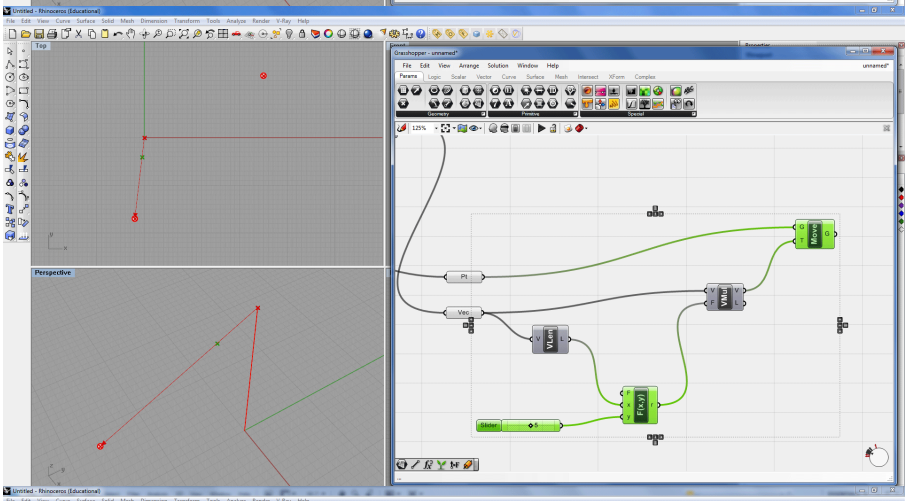
+ MULTIPLY VECTOR BY THE INVERSE NUMBER
+ CONNECT THE VECTOR TO THE MOVE COMPONENT



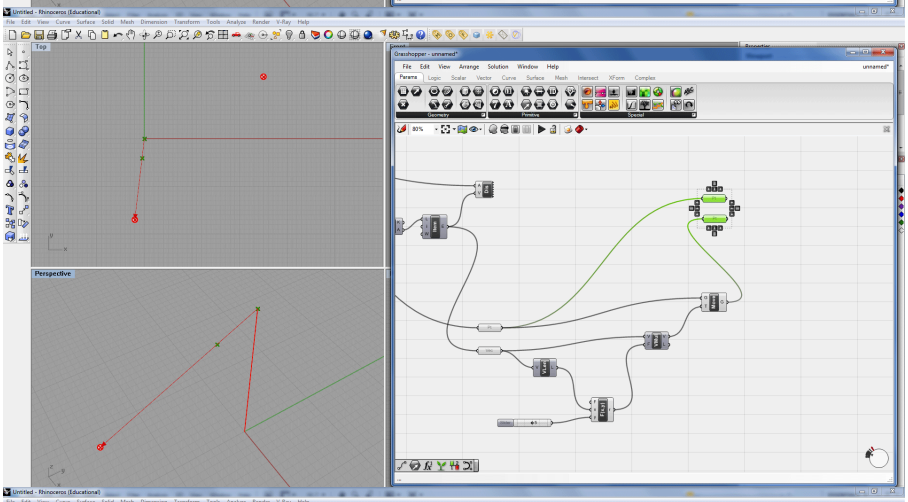
- THE VECTOR IS STILL TOO SHORT

+ SUPPLY ANOTHER FACTOR TO MULTIPLY THE VECTOR

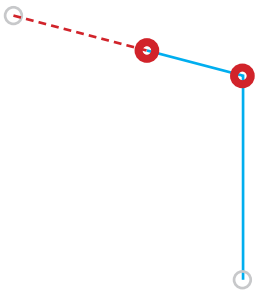
- (1/X)*y

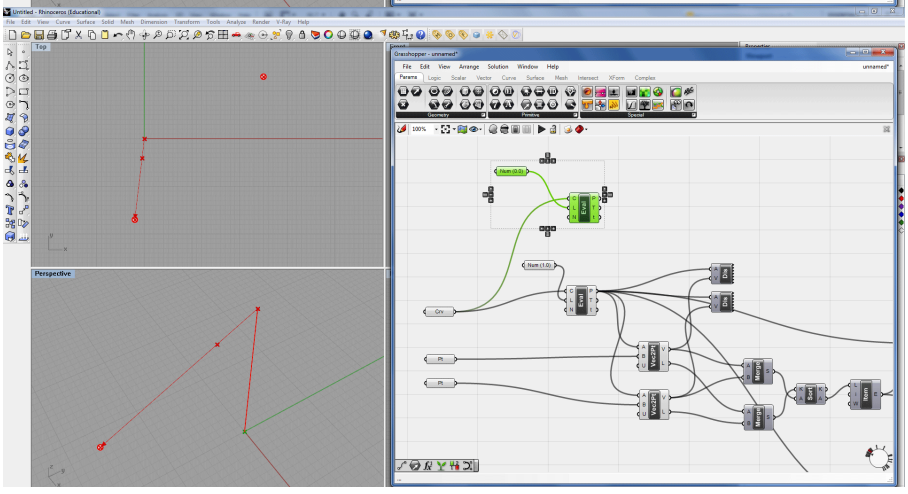


- CONTROL THE POINT BY NUMBER SLIDER

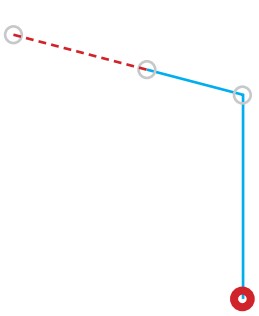


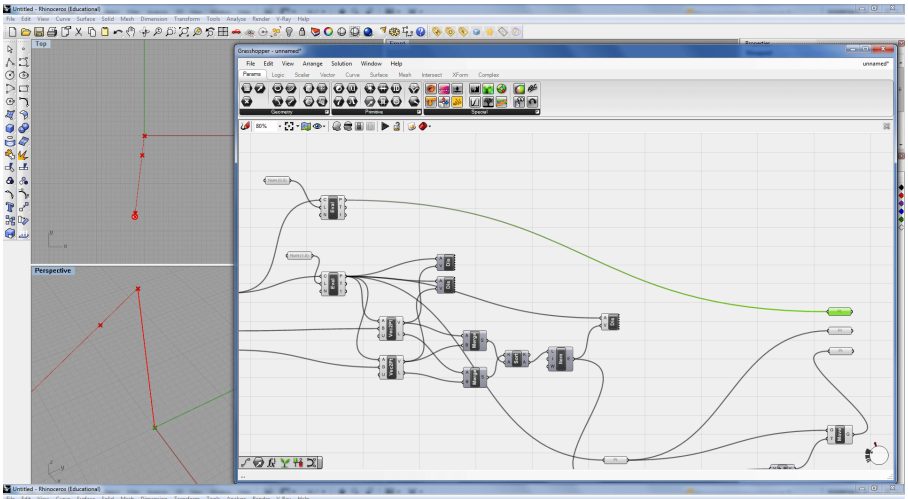
+ EXTRACT TWO POINTS



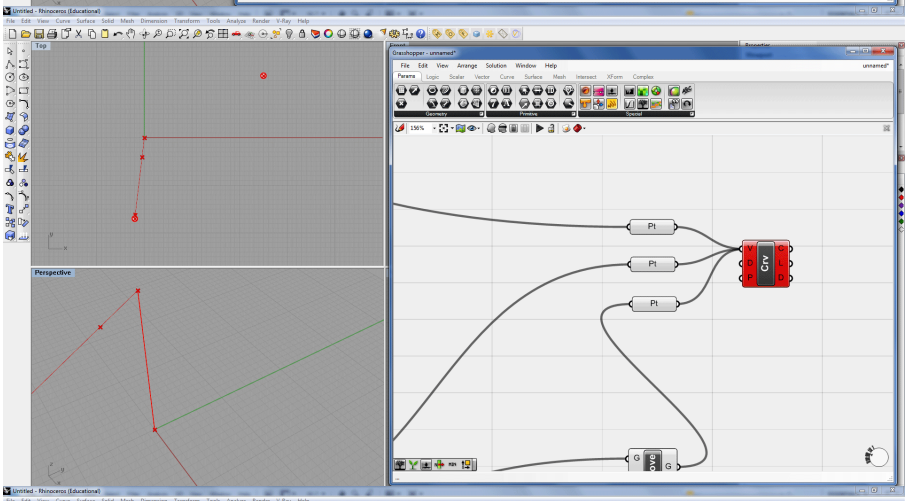


+ GET THE ORIGINE POINT TO DRAW A CURVE

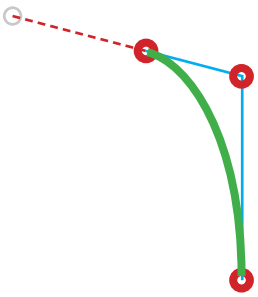


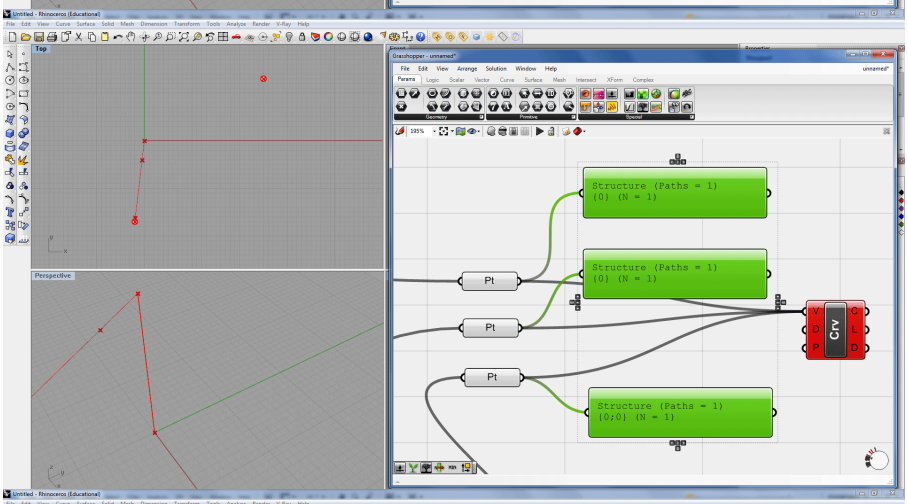


- ALIGN

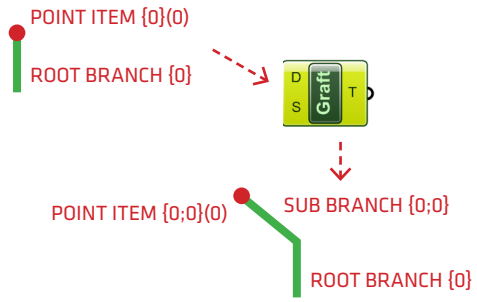


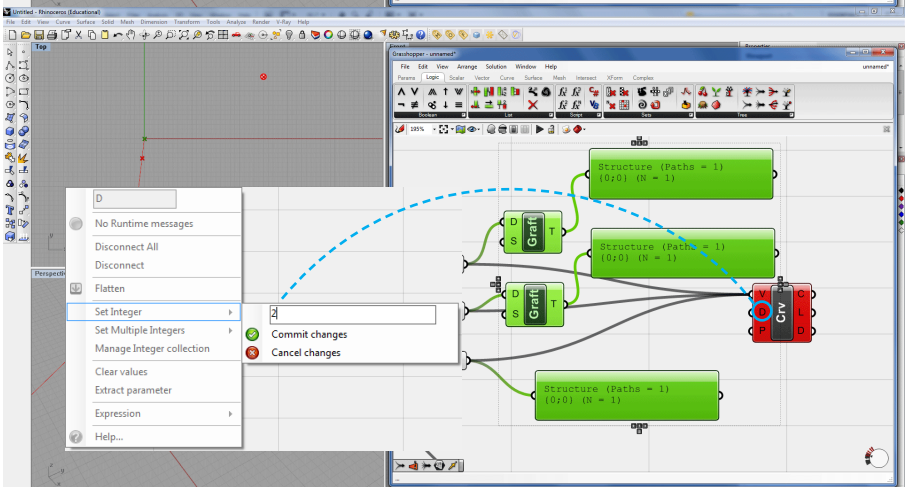

+ CONNECT TO CRV COMPONENT
+ GOT THE ERROR



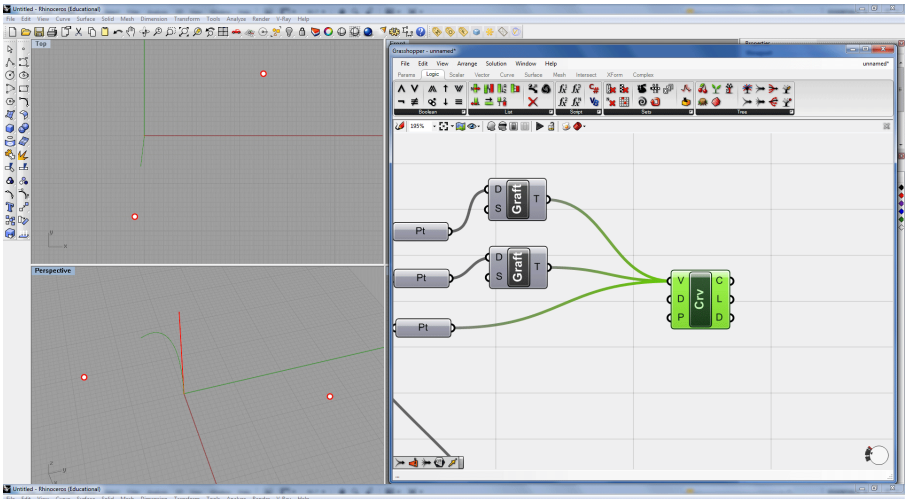



+ DATA STRUCTURES DO NOT MATCH
  - USE GRAFT COMPONENT TO GIVE ONE MORE BRANCH

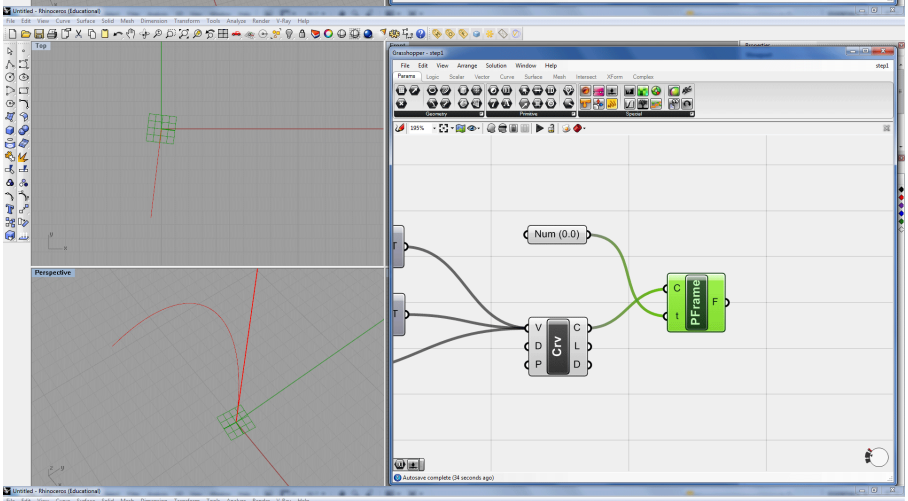


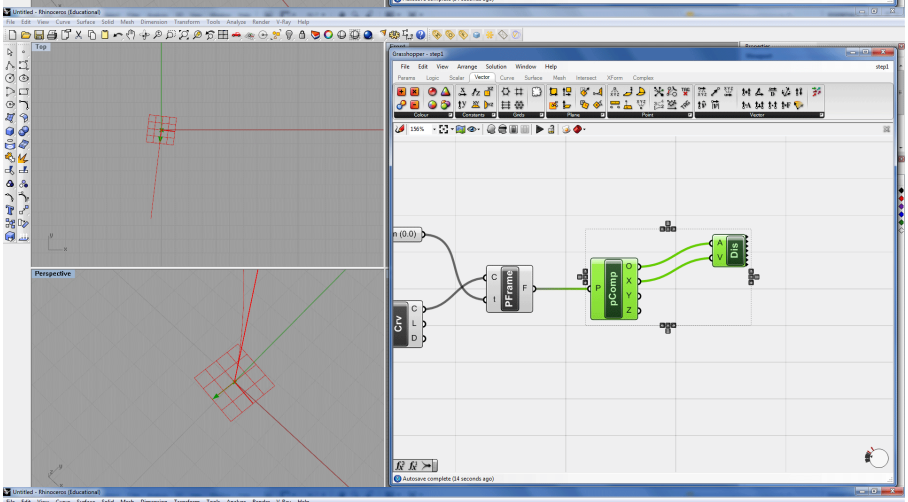

+ STILL NOT WORKING
+ CHANGE DEGREE OF THE CURVE AS 2



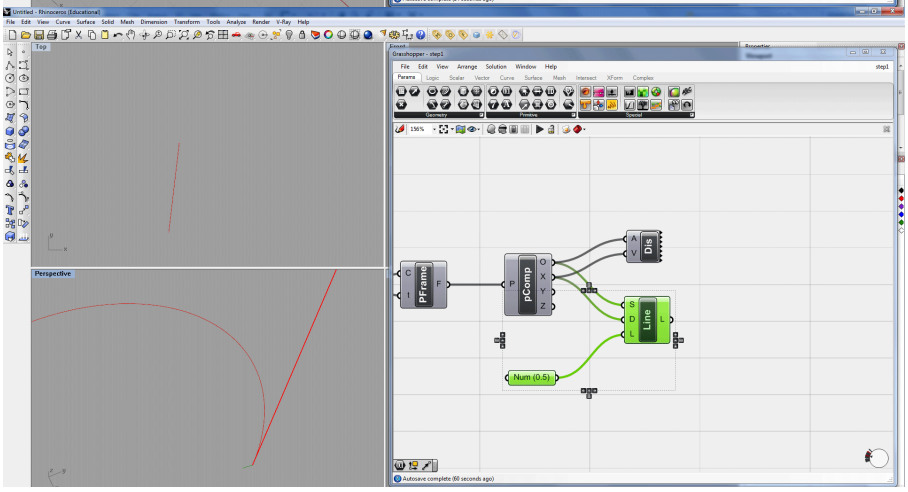

+ GET PERPENDICULAR FRAME AT CURVE START POSITION (t=0)

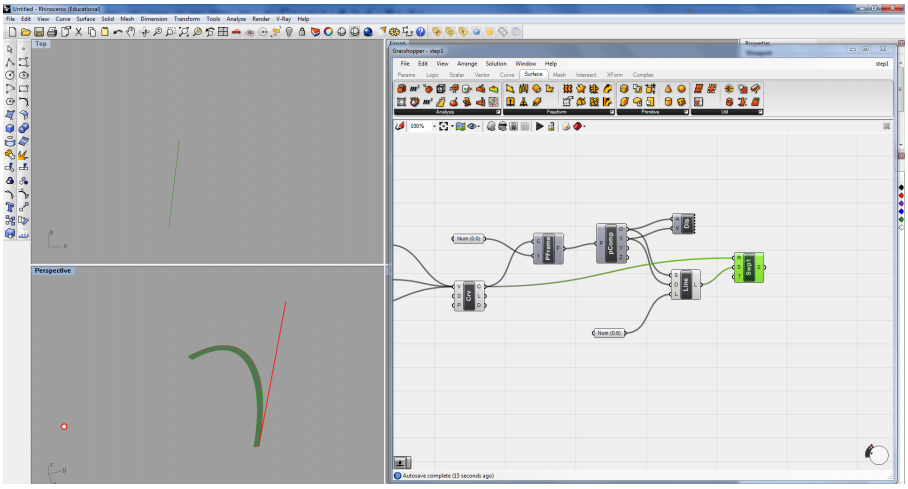



+ DECOMPOSE FRAME TO GET THE ORIGINE AND X VECTOR



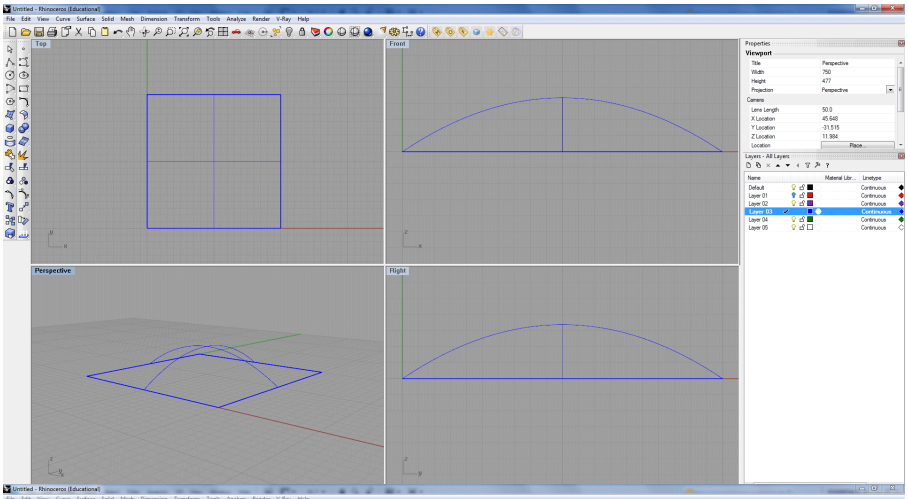

+ DRAW A LINE IN X DIRECTION OF THE LOCAL COORDINATE SYSTEM, AND SET THE LENGTH AS 0.5



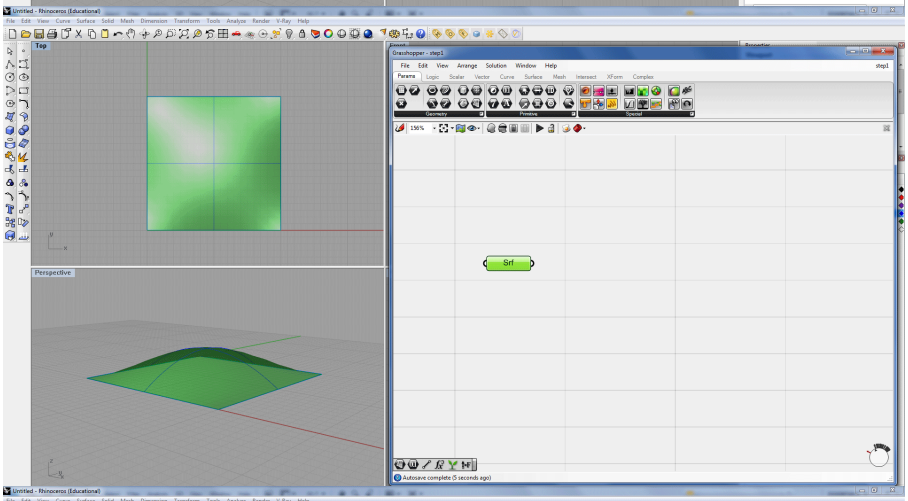


+ **SWEEP 1 RAIL**

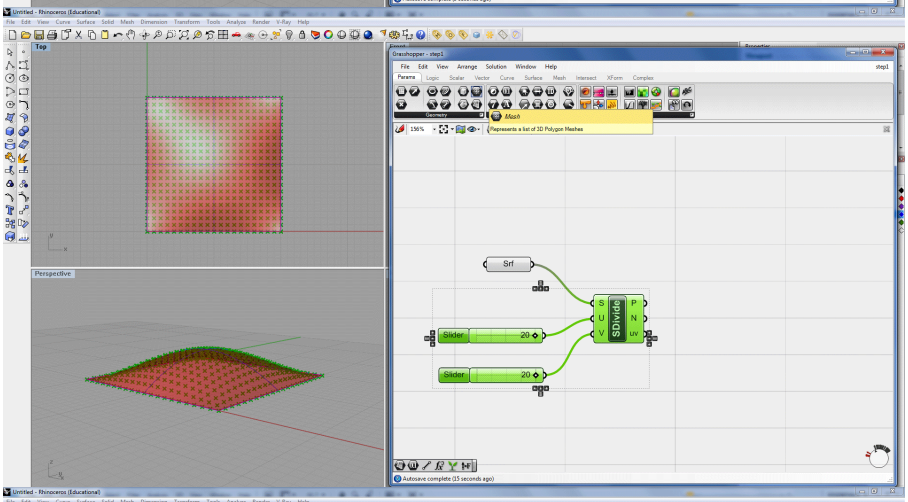
## STEP02



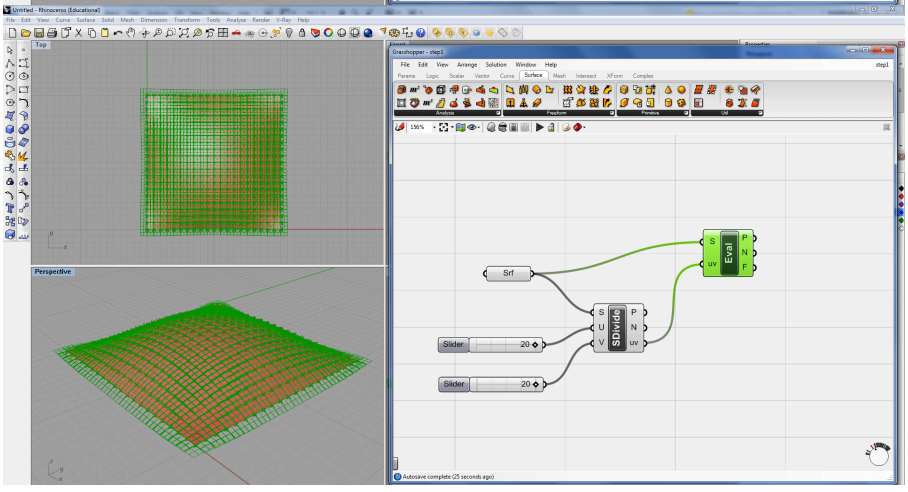
+ BUILD A CURVED PLANE IN RHINO



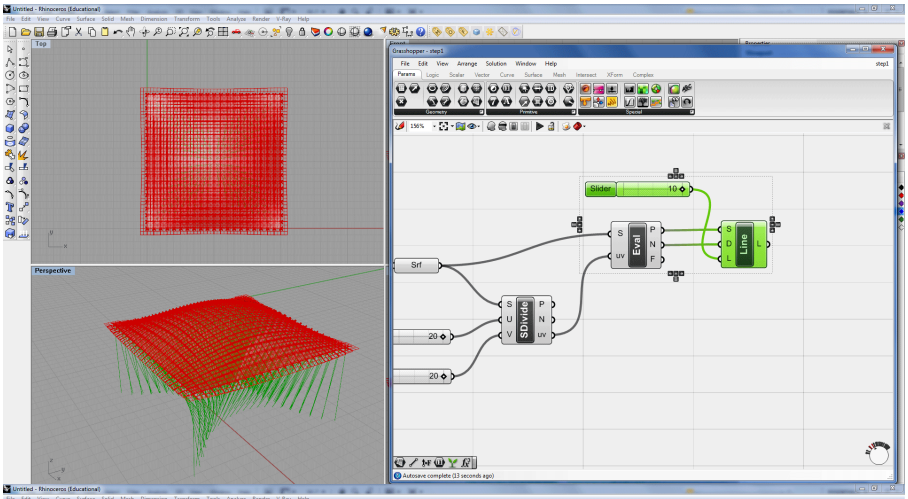

+ GET IT CONNECTED WITH GRASSHOPPER



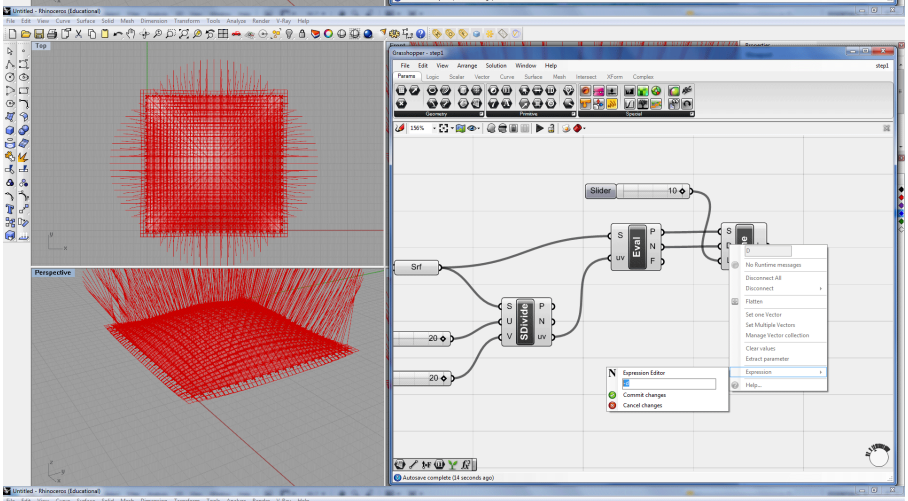

+ DIVIDE SURFACE TO GET SURFACE POINT SET



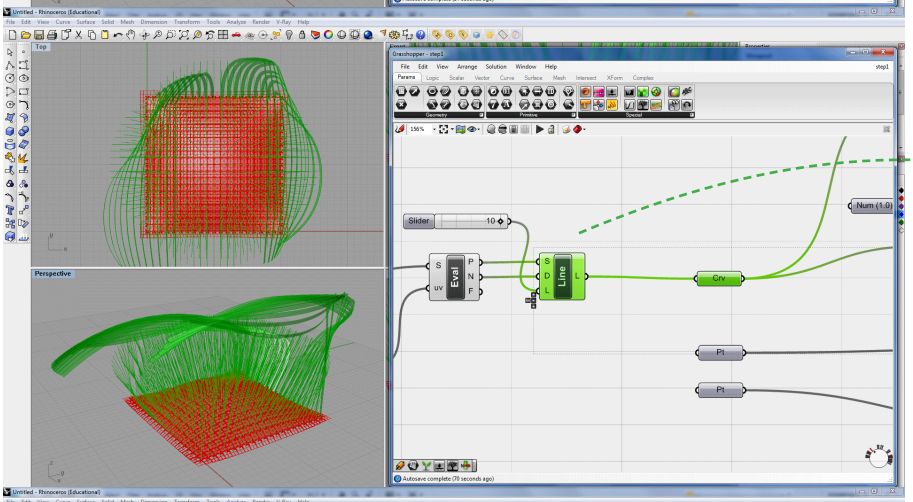

+ EVALUATE SURFACE TO GET NORMAL VECTORS AT SPECIFIC POINTS ON SURFACE



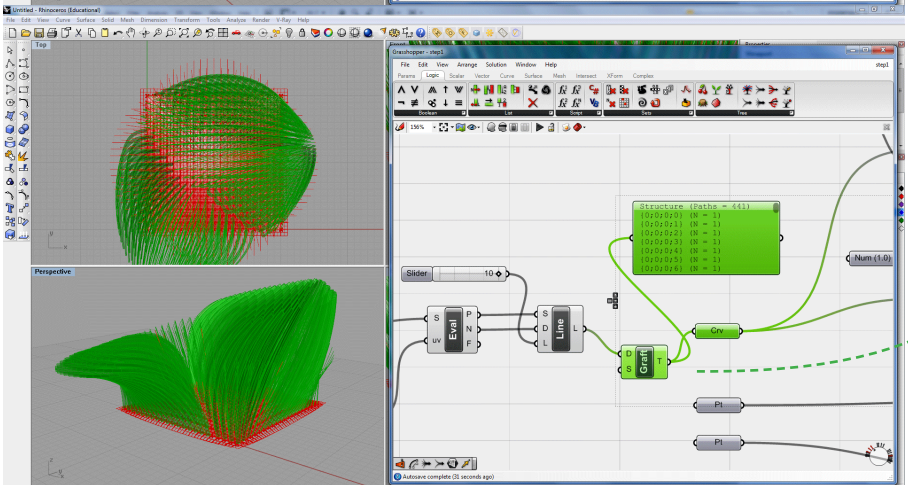
+ DRAW A LINE
  - THE LINES RUN INTO THE OTHER SIDE

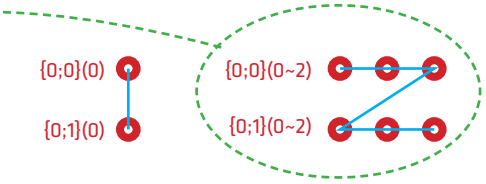


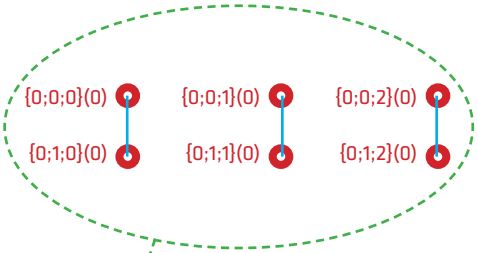
+ EDIT THE EXPRESSION OF DIRECTIONAL VECTOR
+ WE WILL USE THOSE LINES AS OUR BASE CURVE

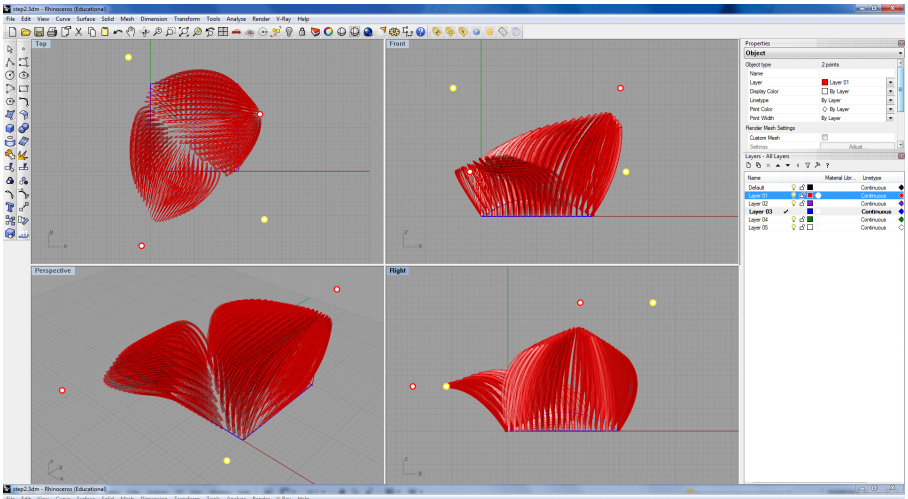


+ CONNECT OUR COMPONENT TO THE LINES
  - DATA MATCHING?

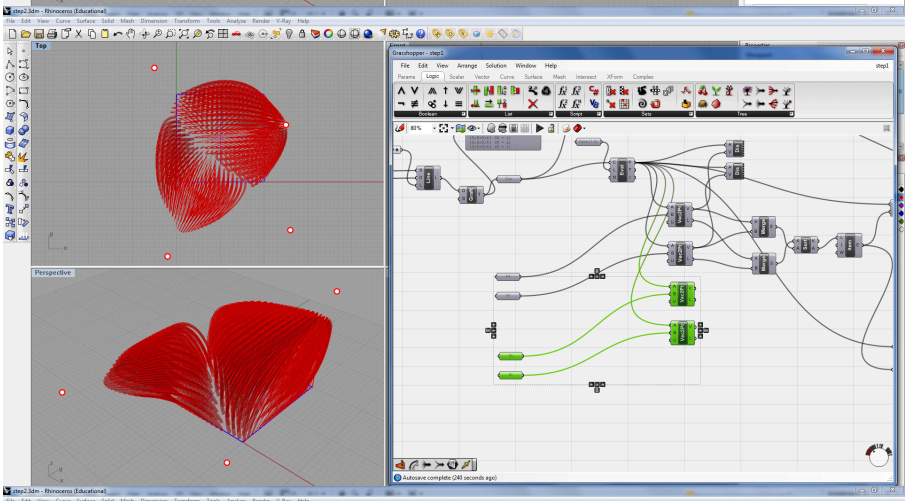




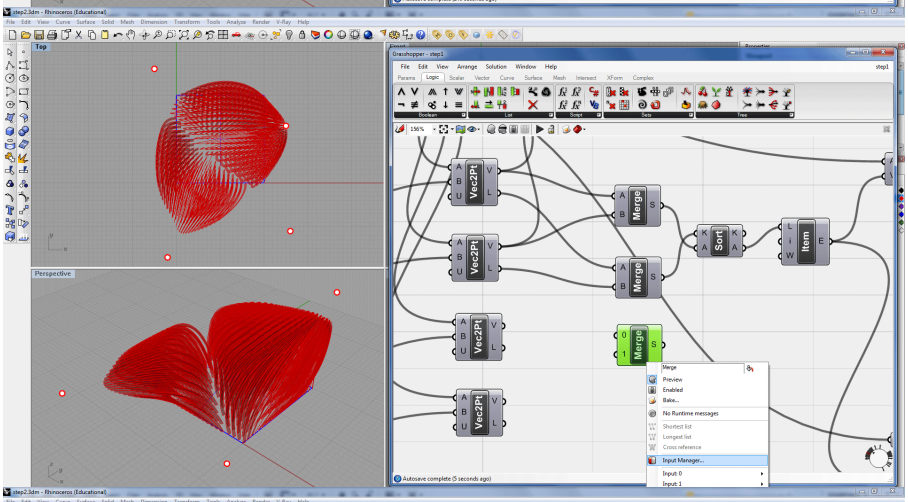





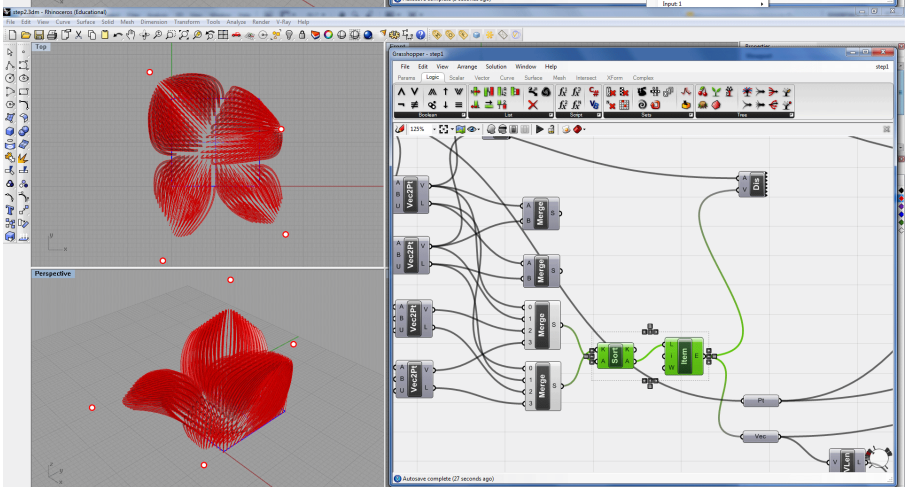
+ NEED MORE POINT ATTRACTORS?



+ COPY AND PASTE



+ GET MULTIPLE MERGE COMPONENT
+ ADD TWO MORE INPUT TAB IN THE INPUT MANAGER
  - RIGHT CLICK ON ‘MERGE’ AND SELECT INPUT MANAGER



+ CONNECT ‘MULTIPLE MERGE OBJECT’ TO SORT COMPONENT
+ DONE!