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I go broke!

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I go broke!
As Barb registered first

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Cycle! Who gets the computer???

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Recent conference at IMBS,

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Dimensionality of issues

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Priority: registering

Dimensionality of issues

Good intensions

Protection against exploitation

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Dimensionality of issues

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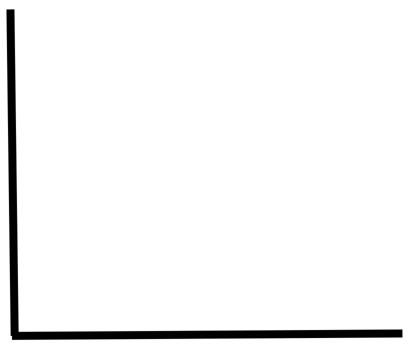
Avoiding cycles:



Priority: registering

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Avoiding cycles:
Core:

Dimensionality of issues

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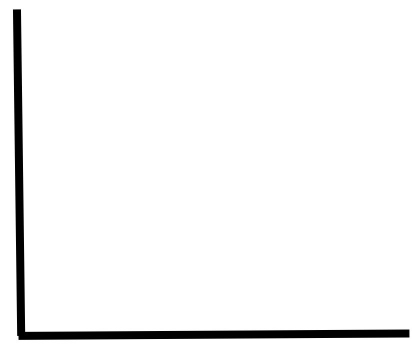

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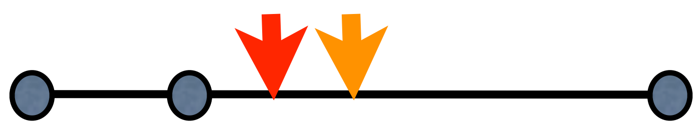

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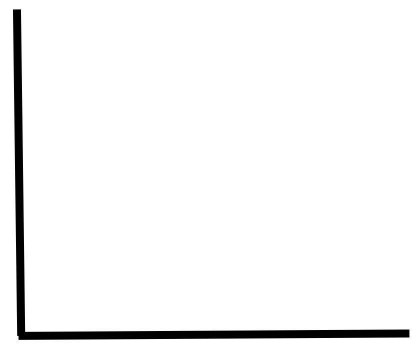

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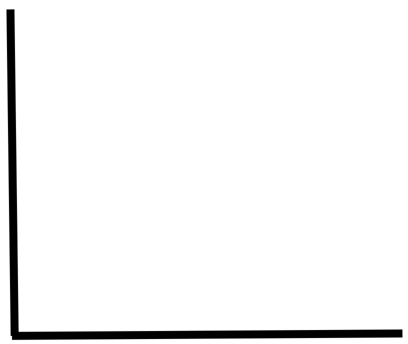

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Median voter theorem

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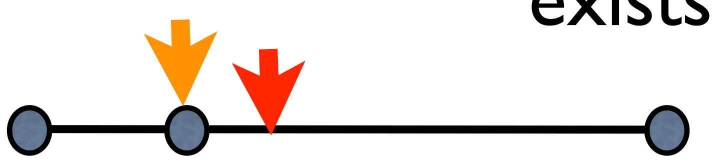
Median voter theorem
One issue, core always exists



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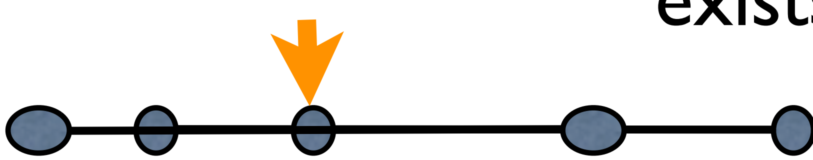

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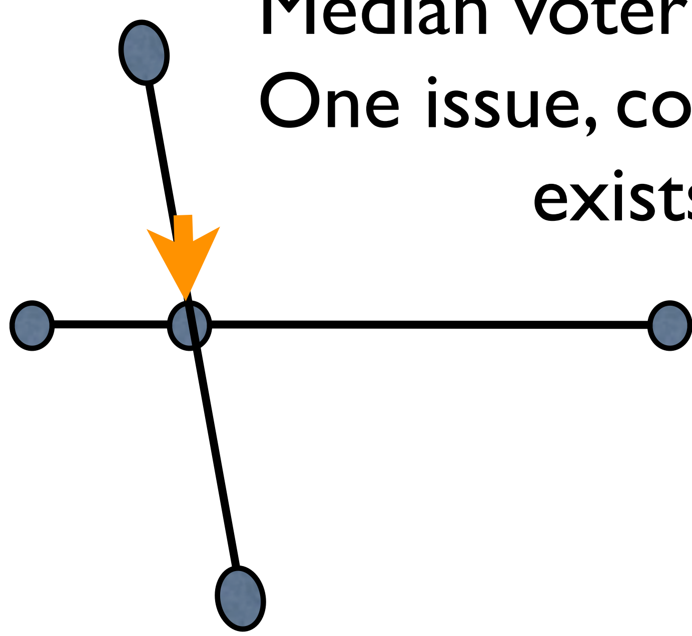

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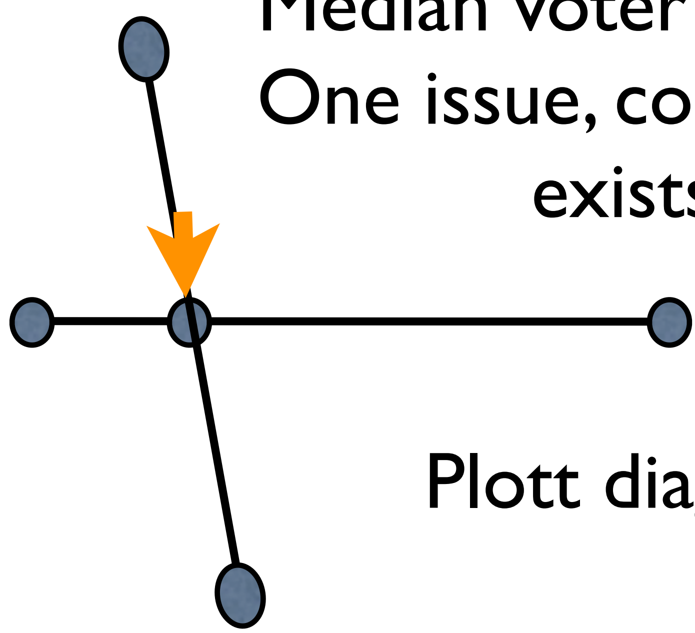

Plott diagram

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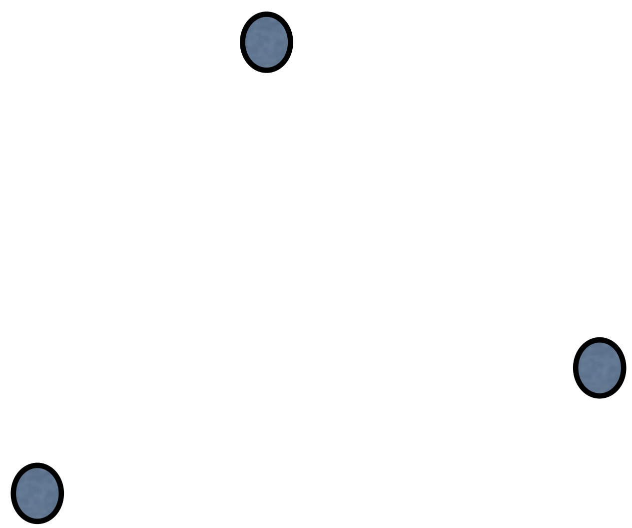
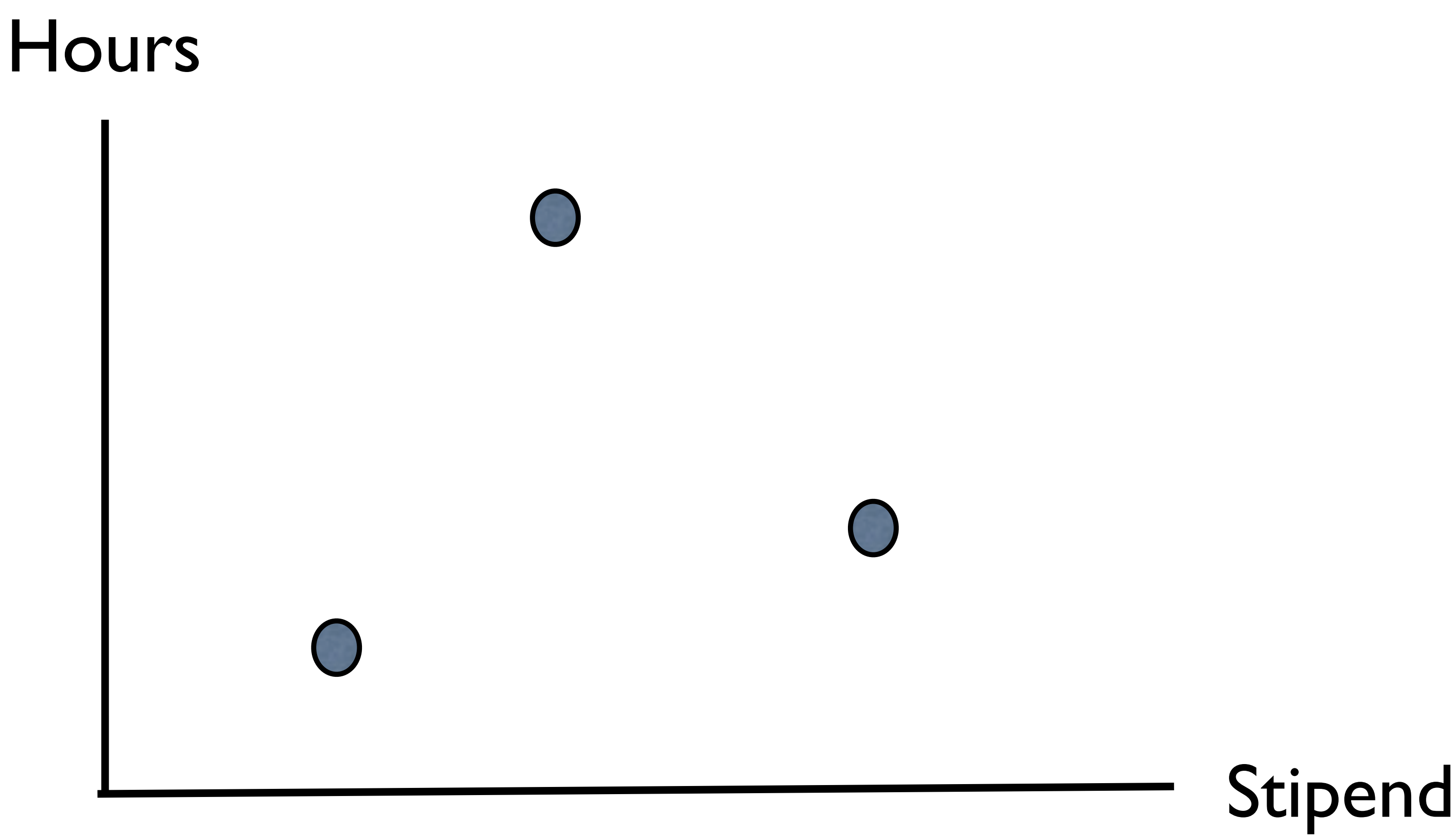
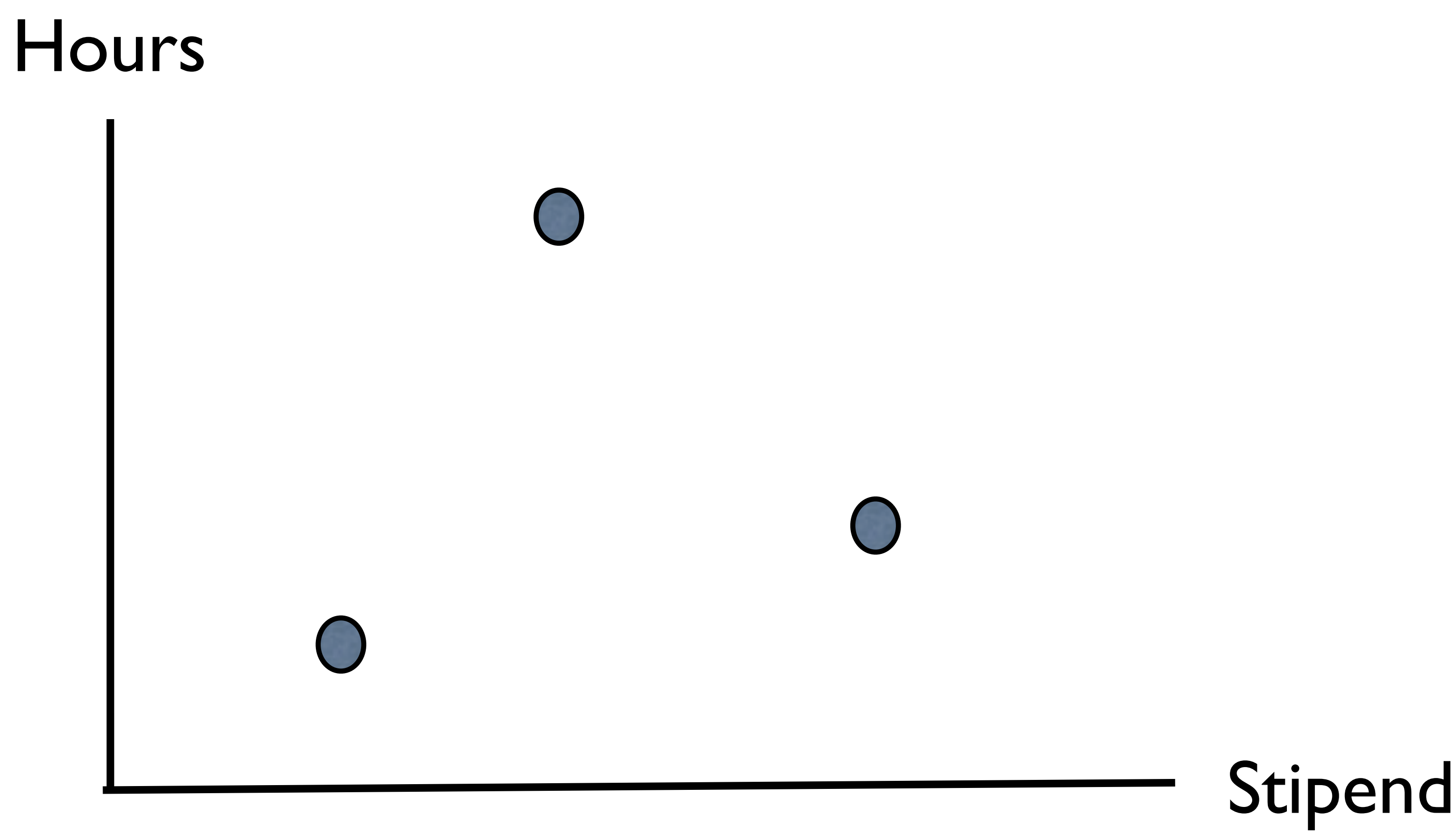
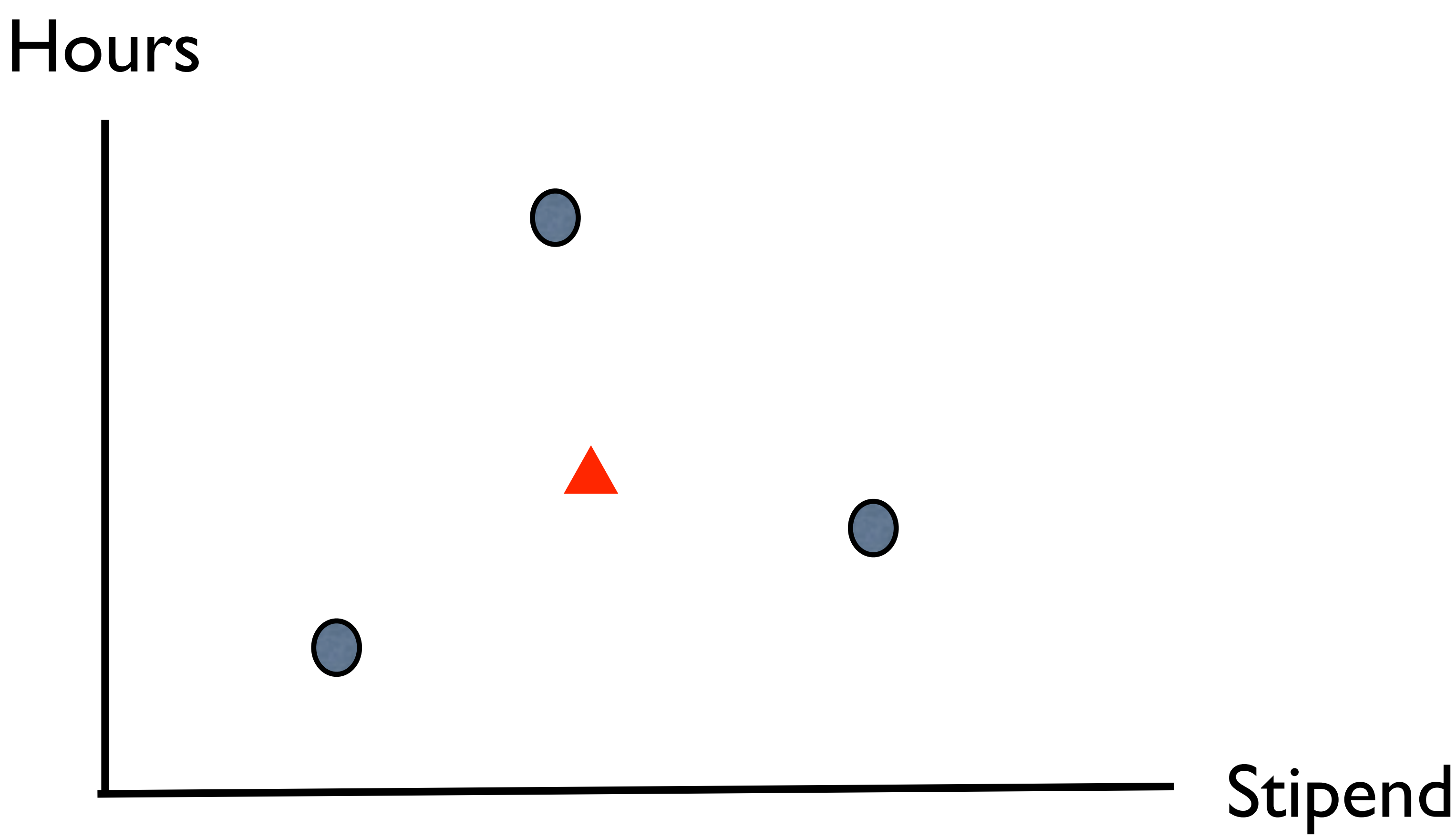



Hours
Stipend

Core?



Core?



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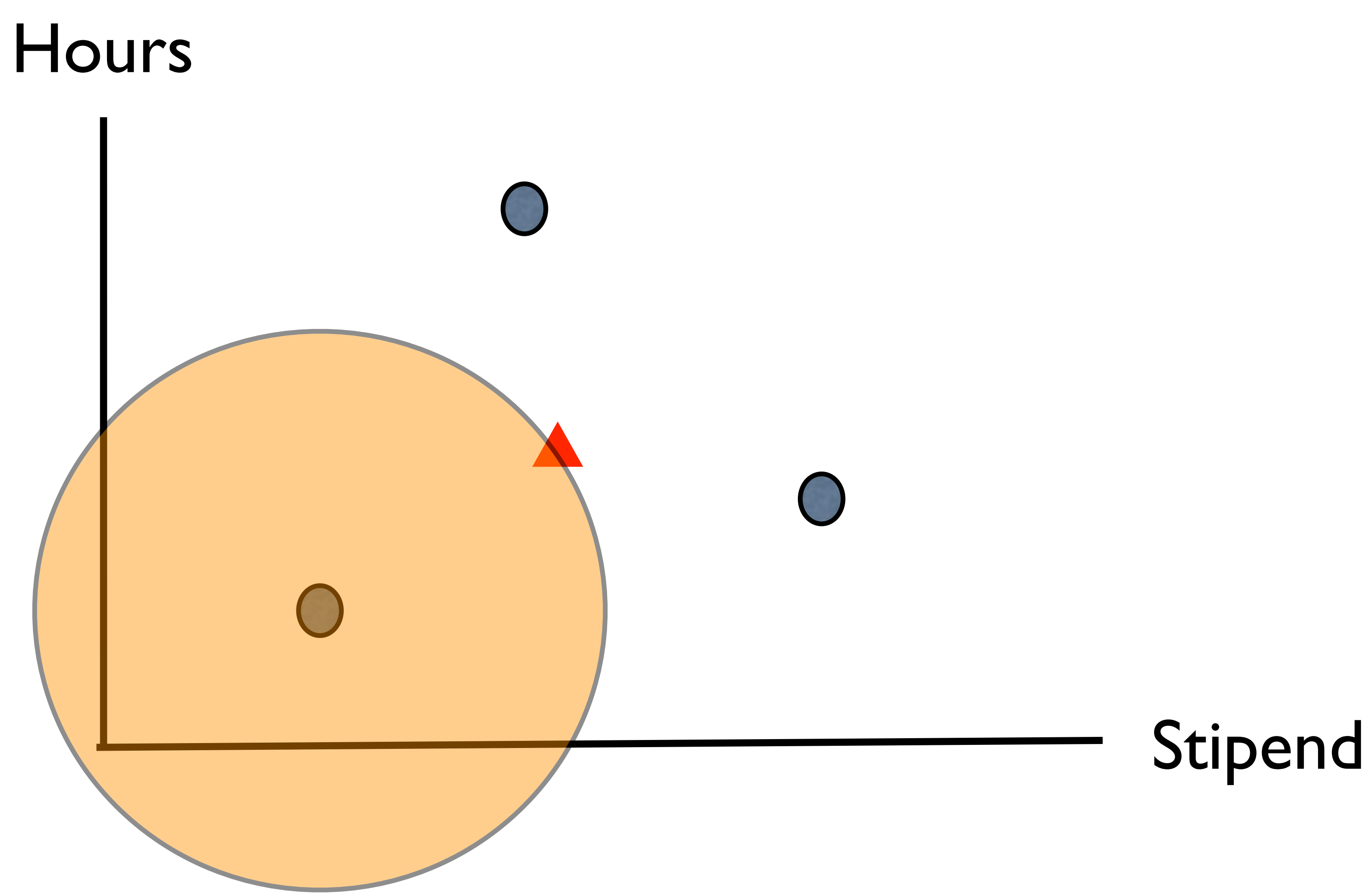

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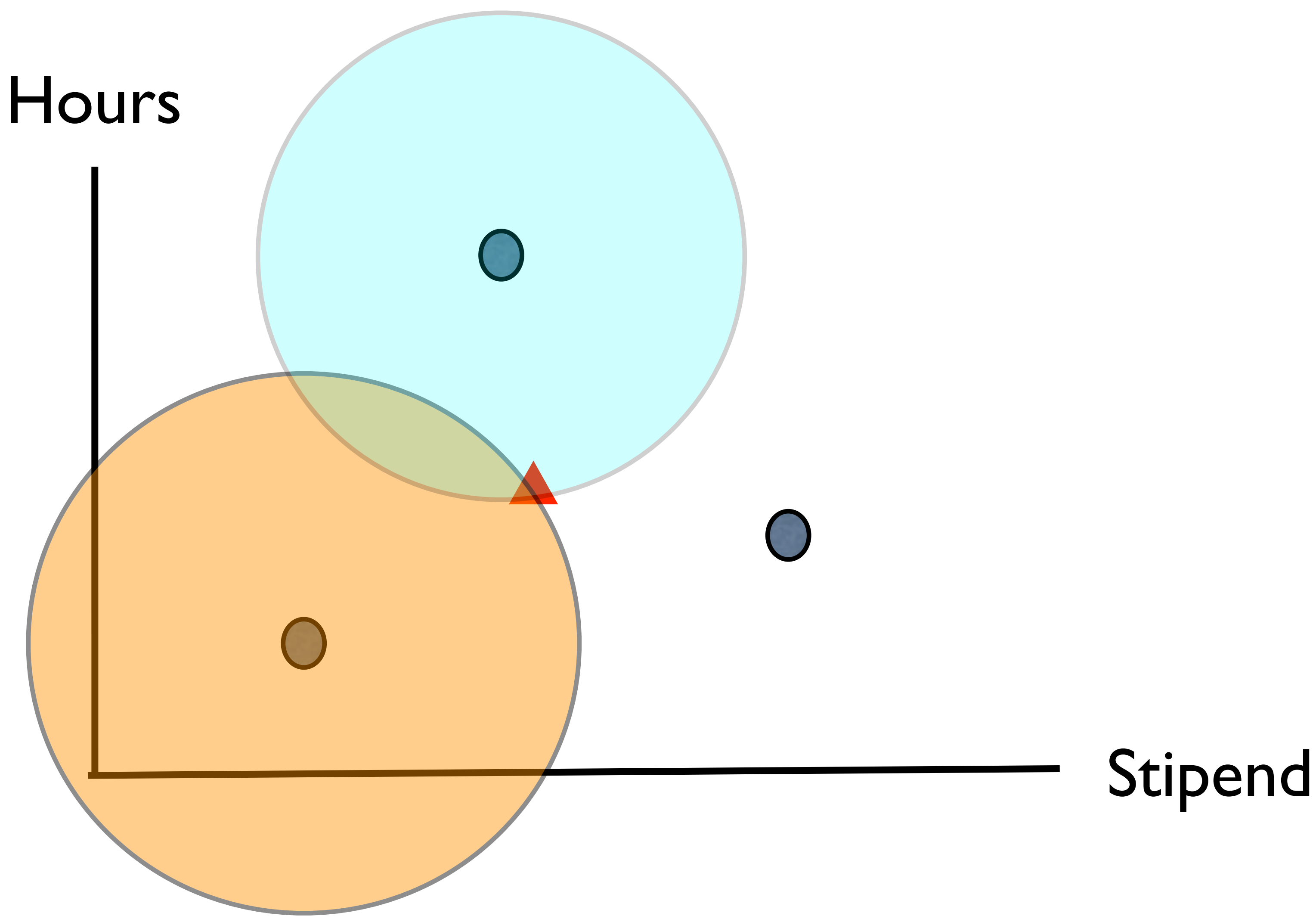
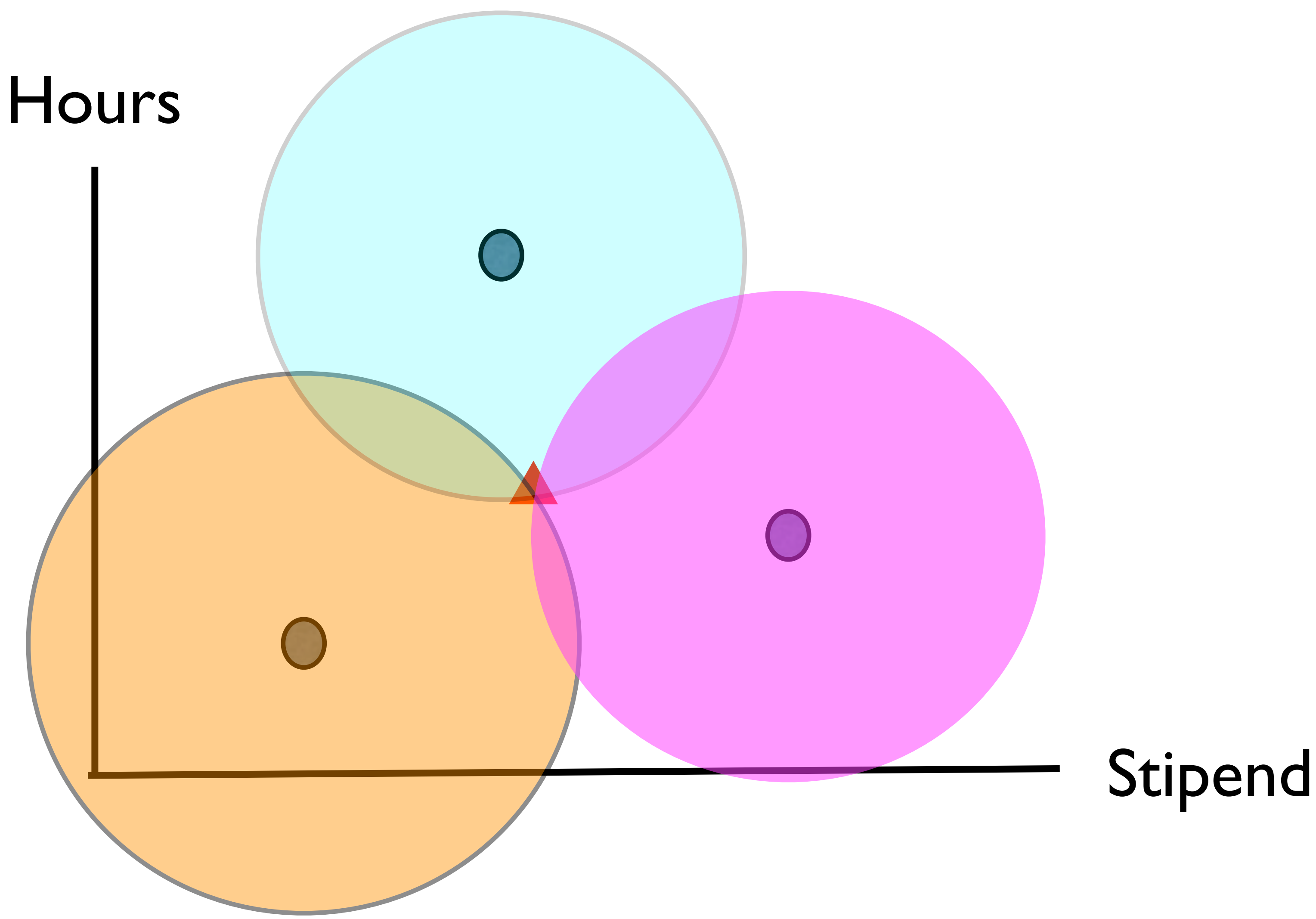


Core?



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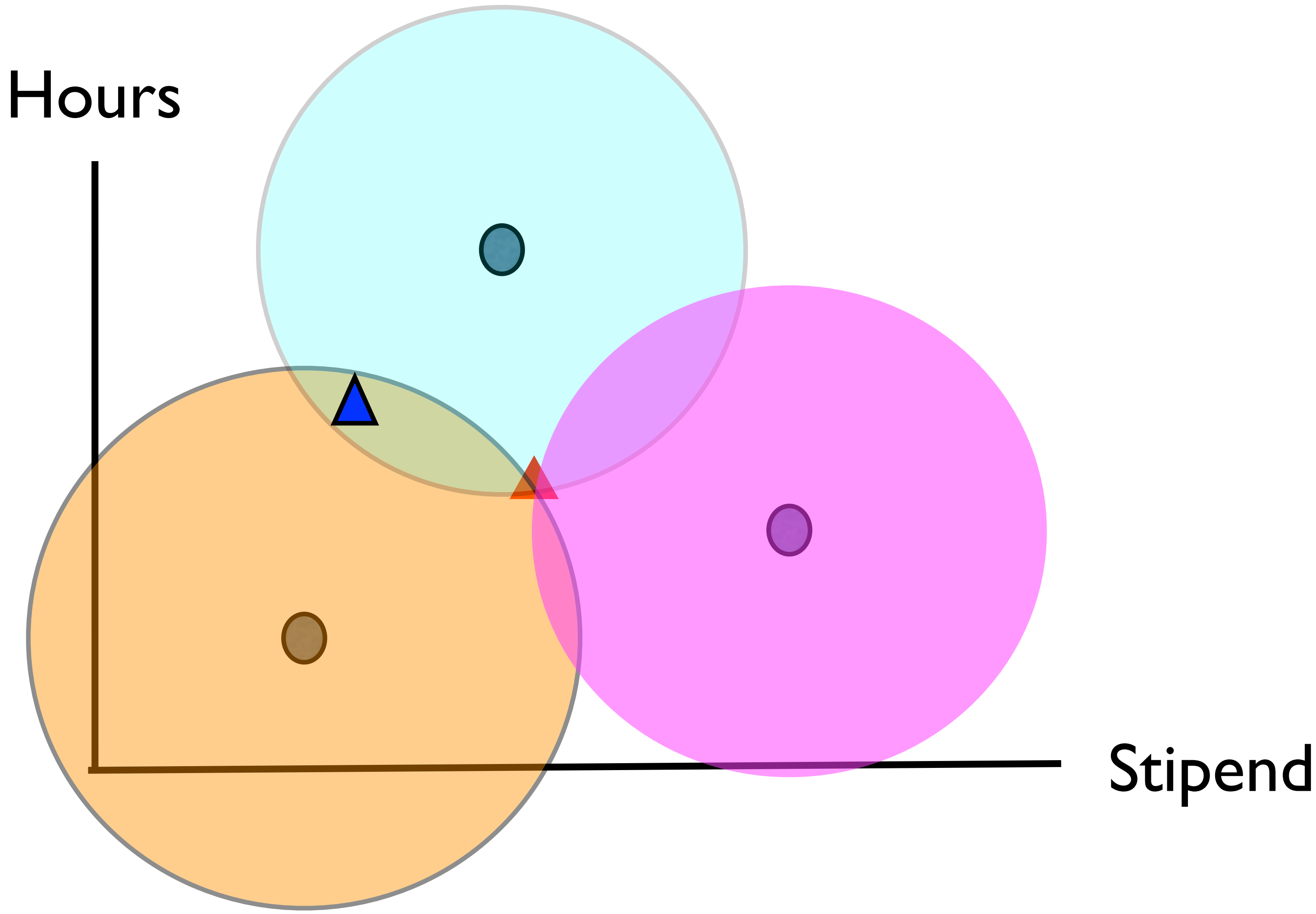
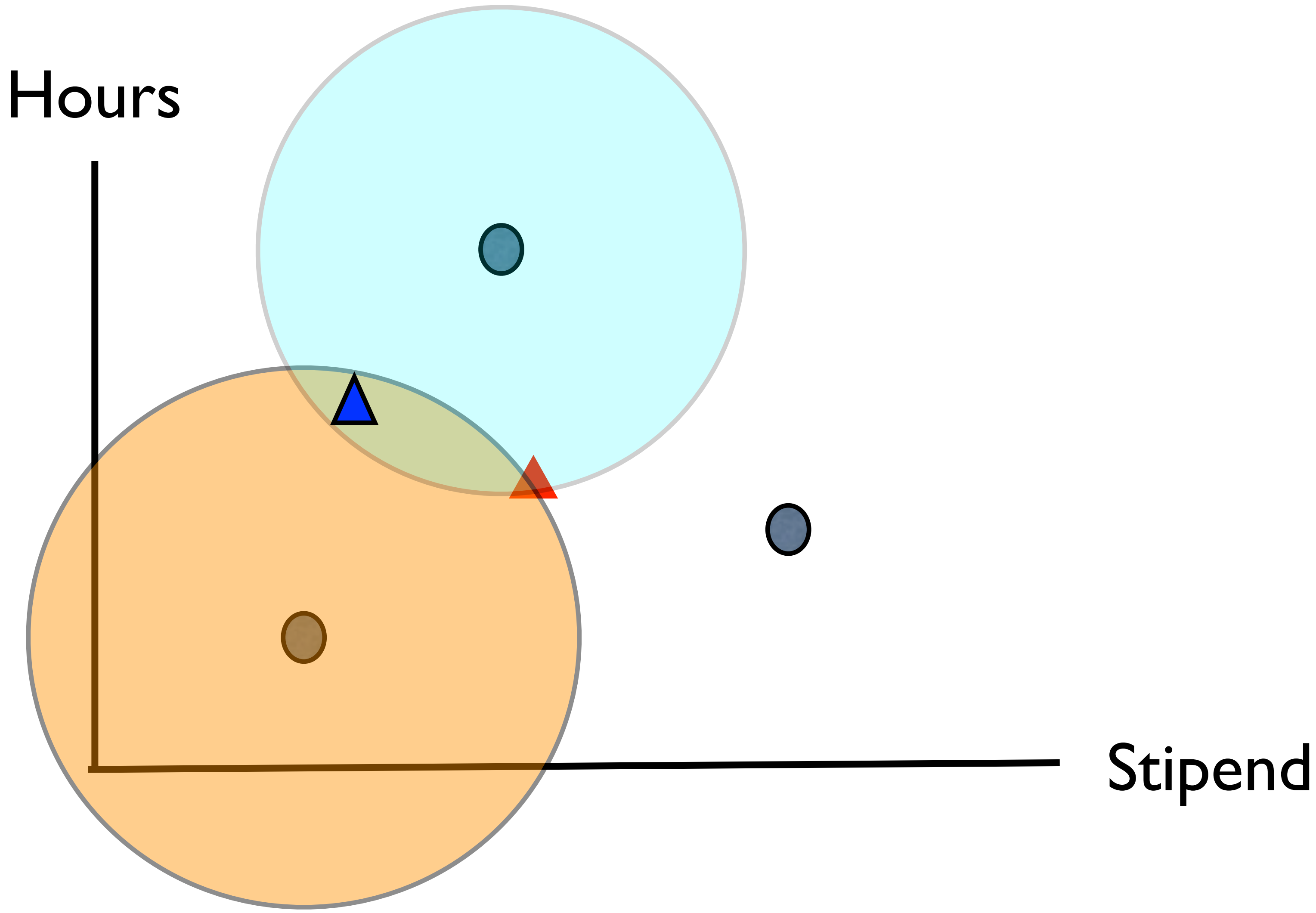
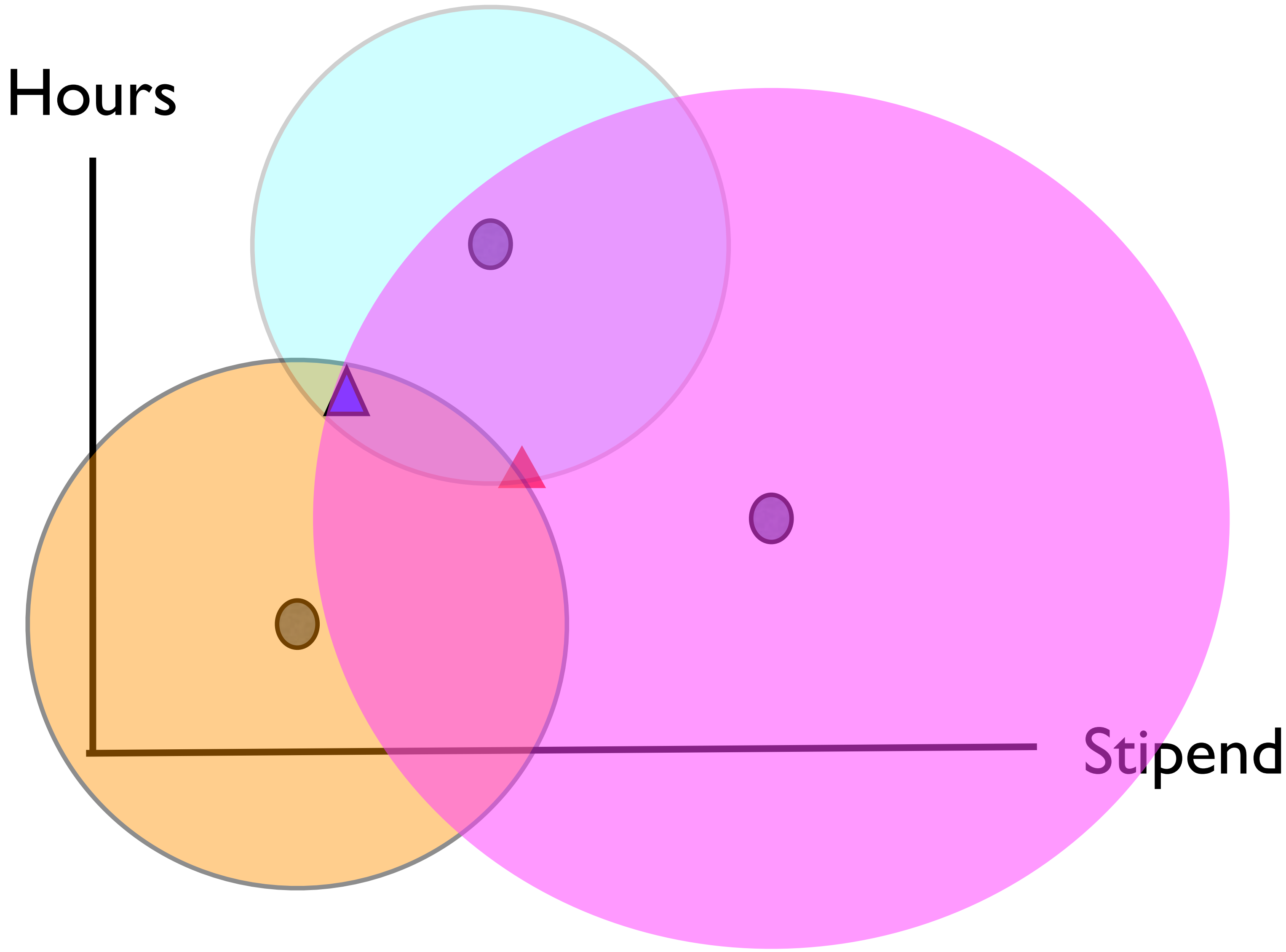
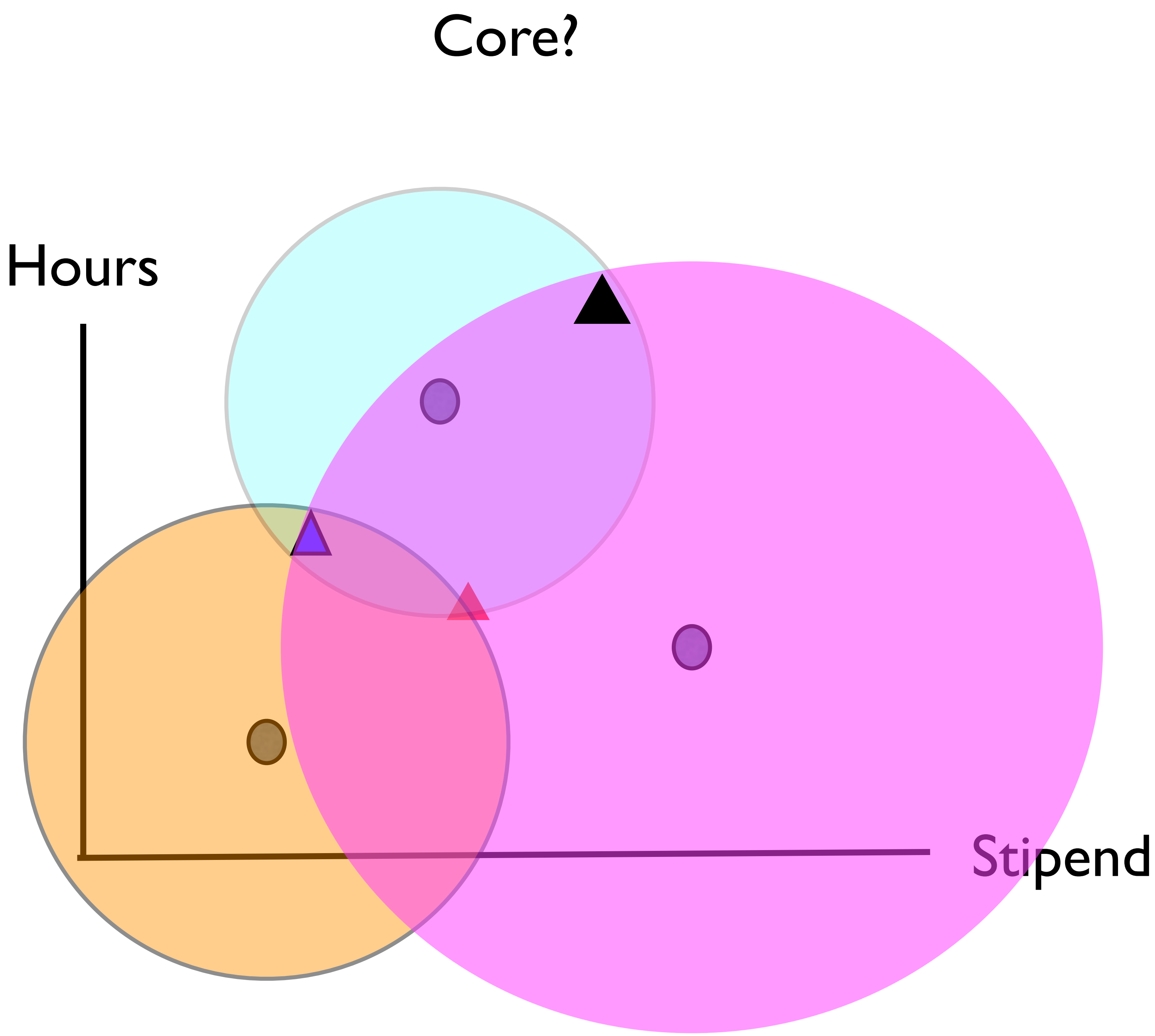


Core?

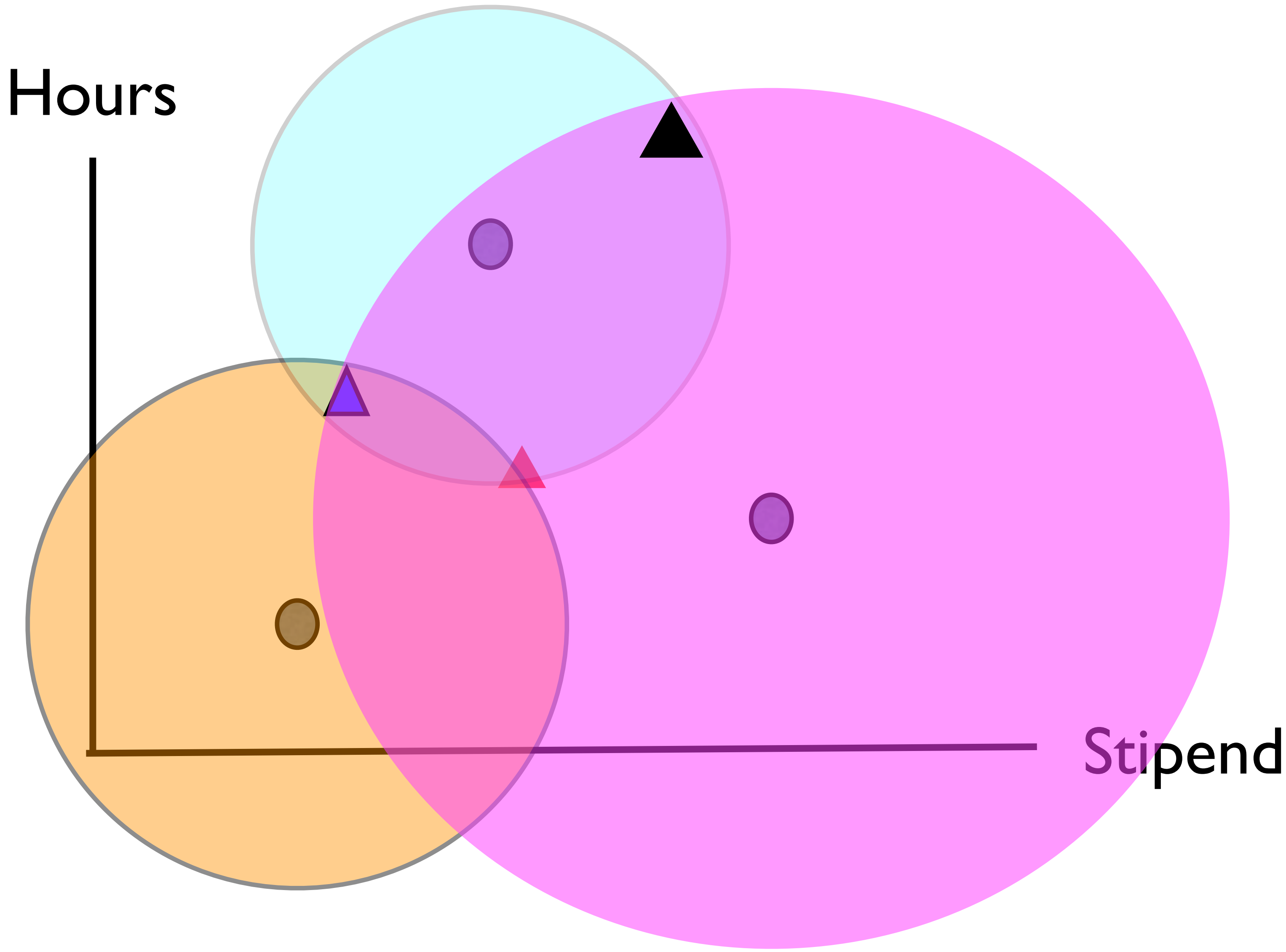


Core?



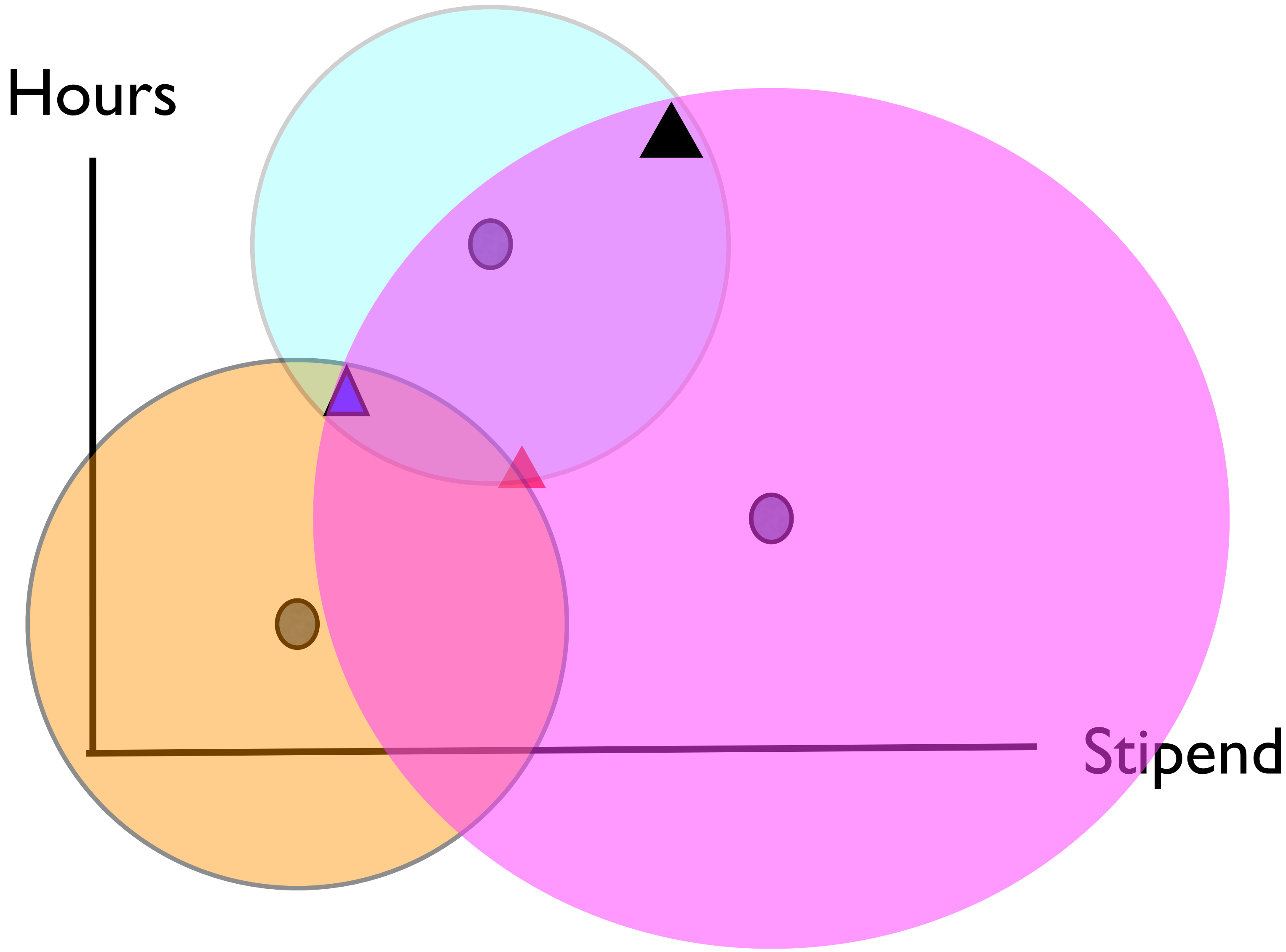

Core?
Hours
Stipend

Core?   Here the core is empty

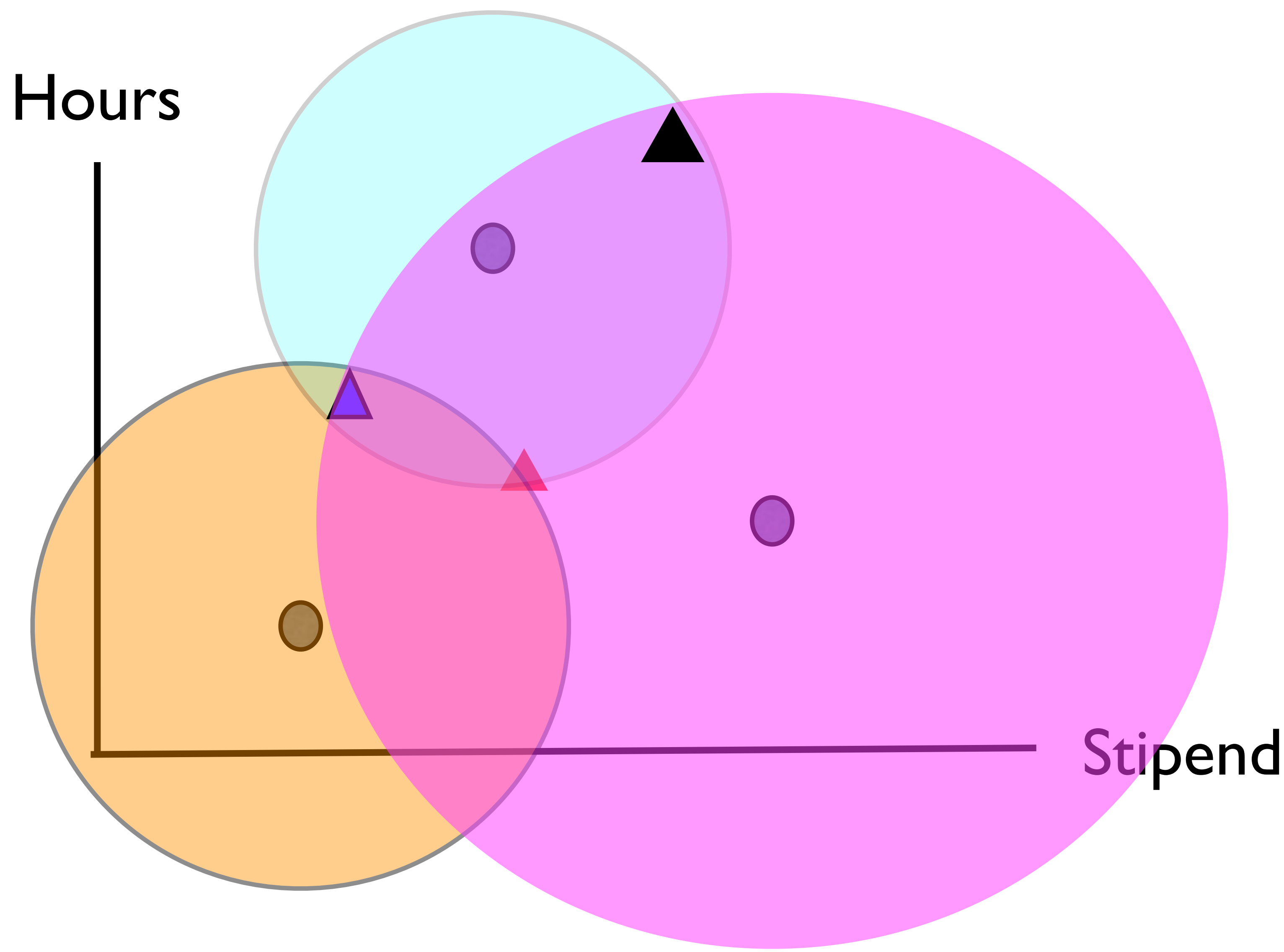


Core?   Here the core is empty

McKelvey:

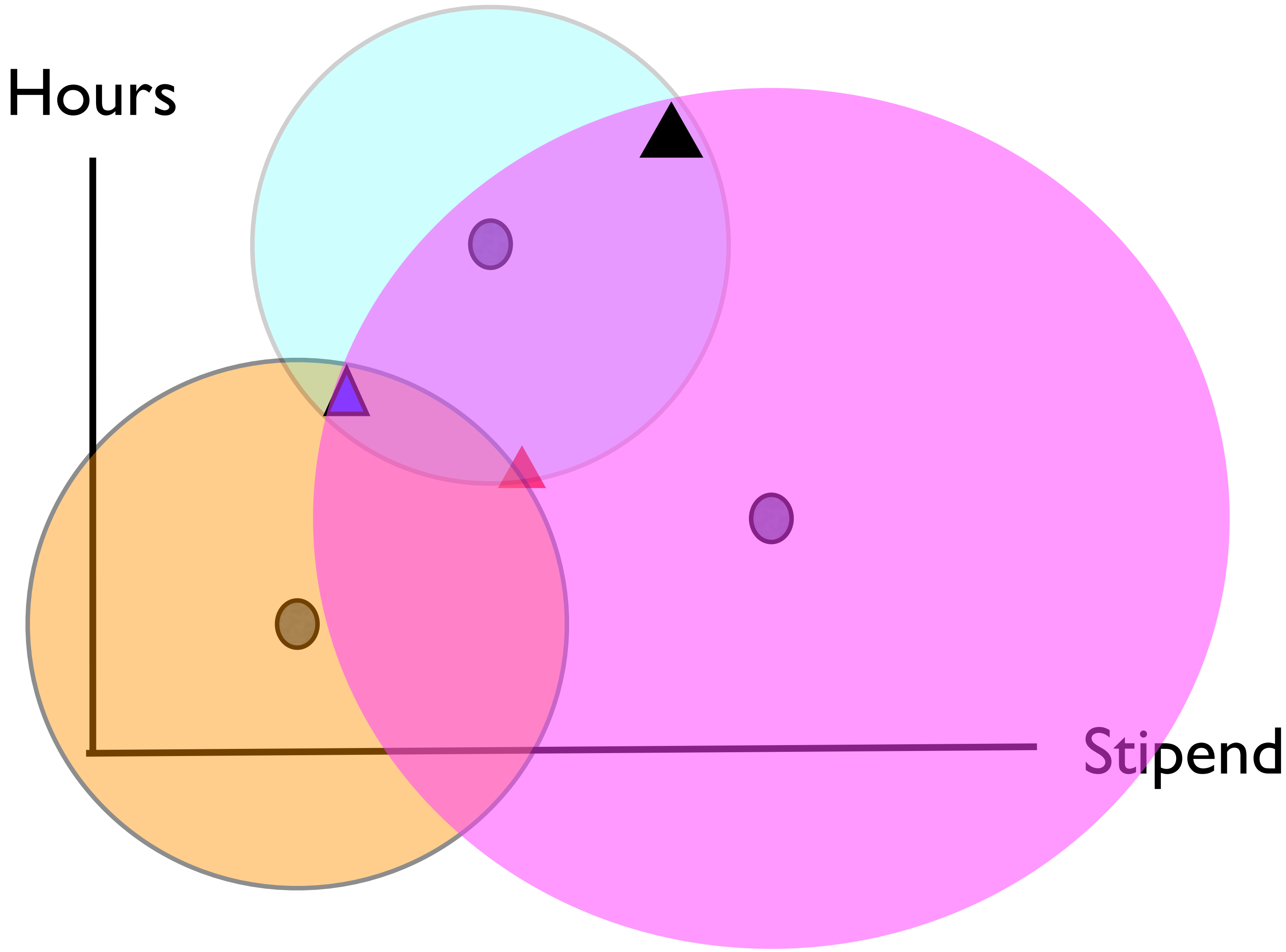


Core? Here the core is empty



McKelvey:
For majority rule, any number of voters, empty core, select a starting and ending point. There exists an agenda going from one to the other.

Core? Here the core is empty



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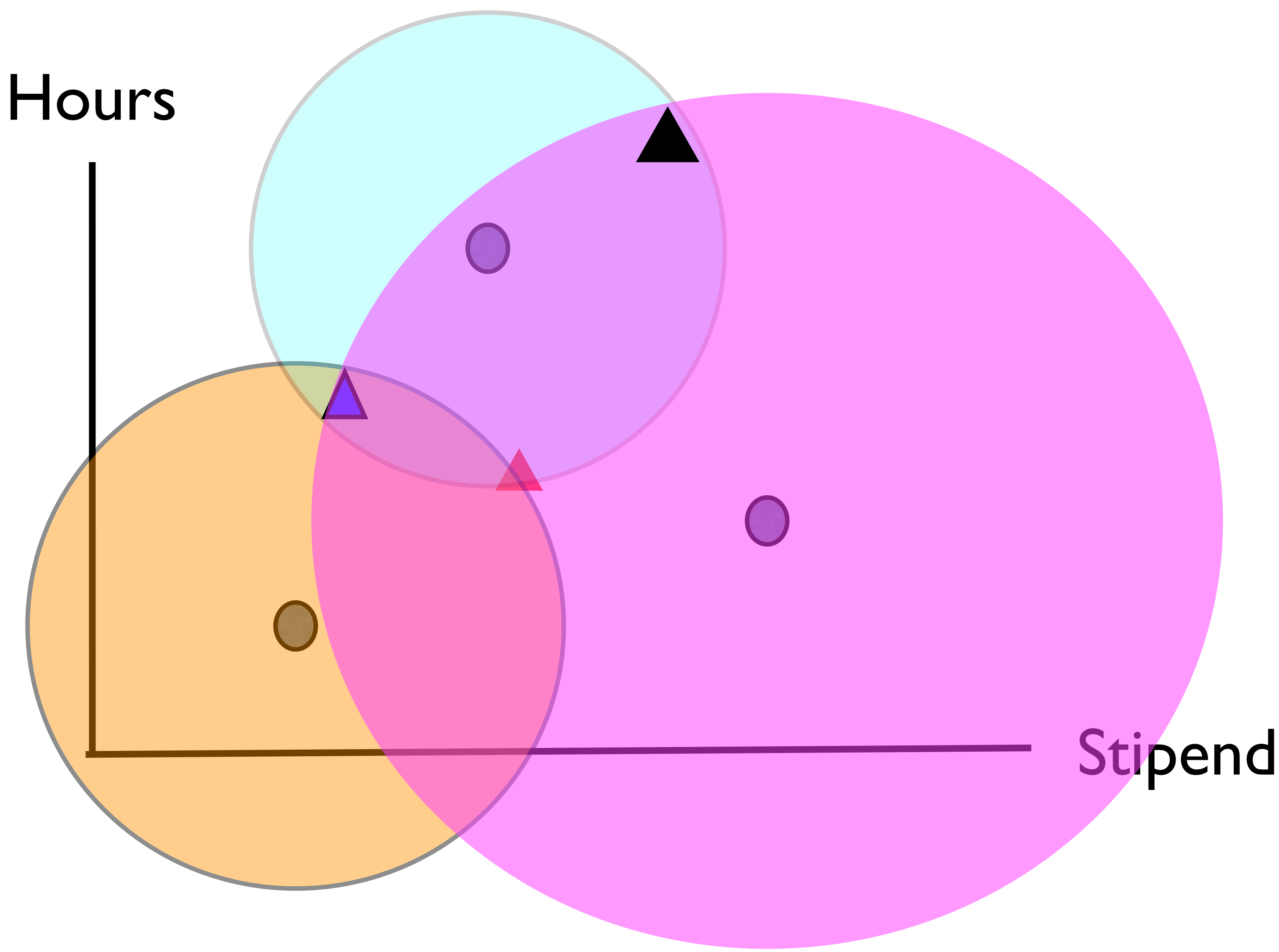
Idea for proof: Differential topology

Core? Here the core is empty



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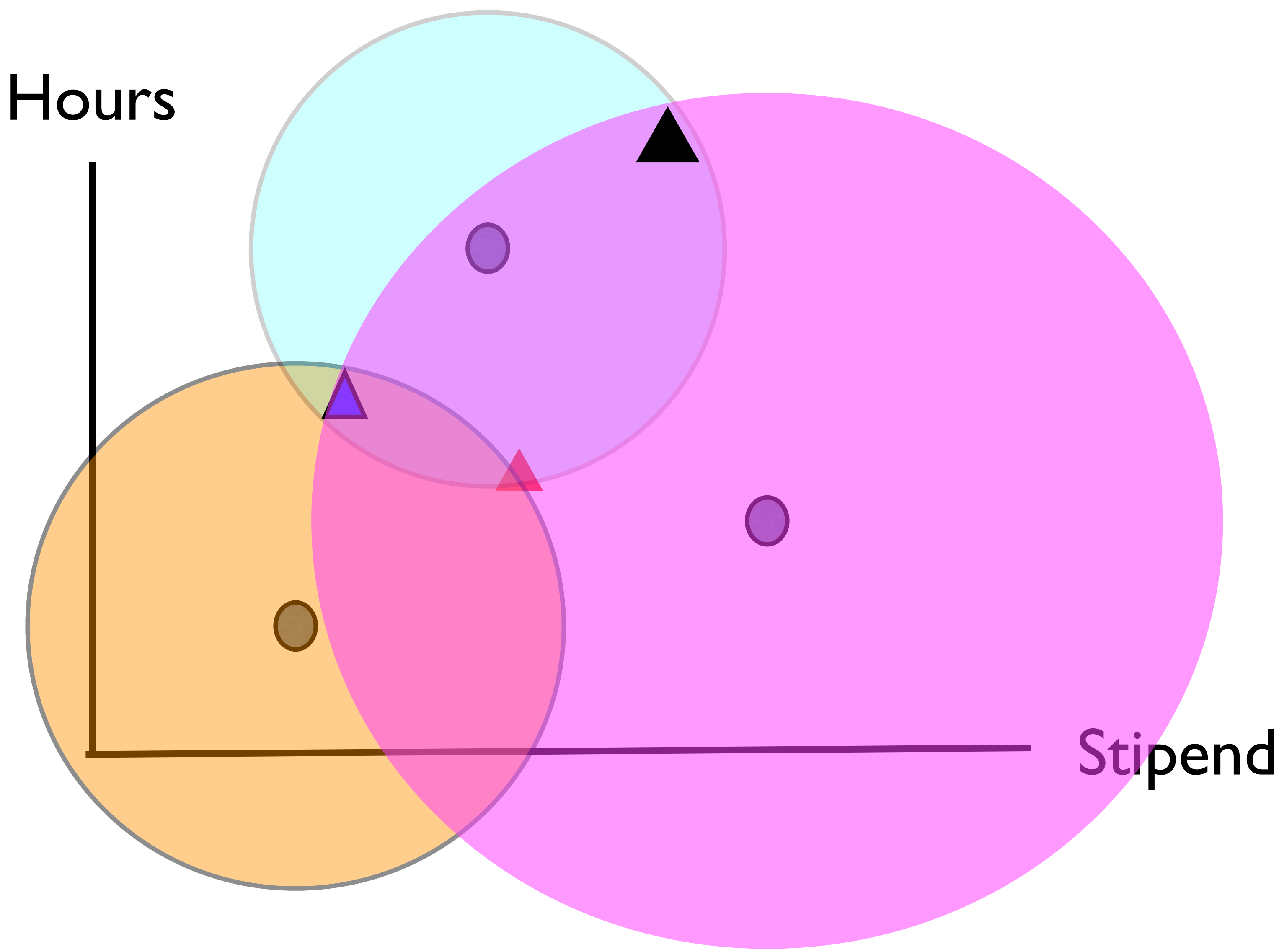
Examples:

Core?   Here the core is empty



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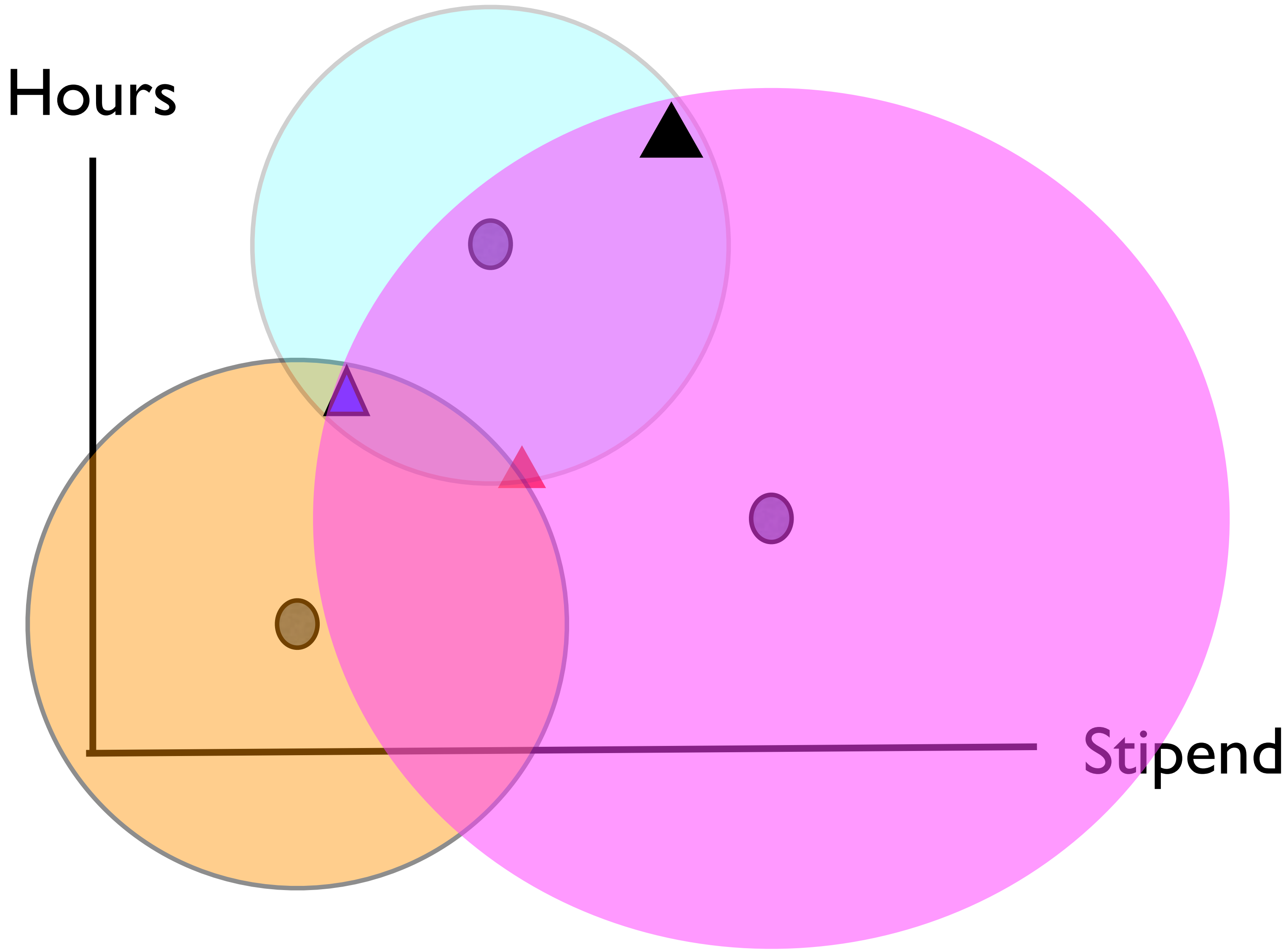
Idea for proof: Differential topology
Examples:
Iraq

Core?   Here the core is empty



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Idea for proof: Differential topology
Examples:
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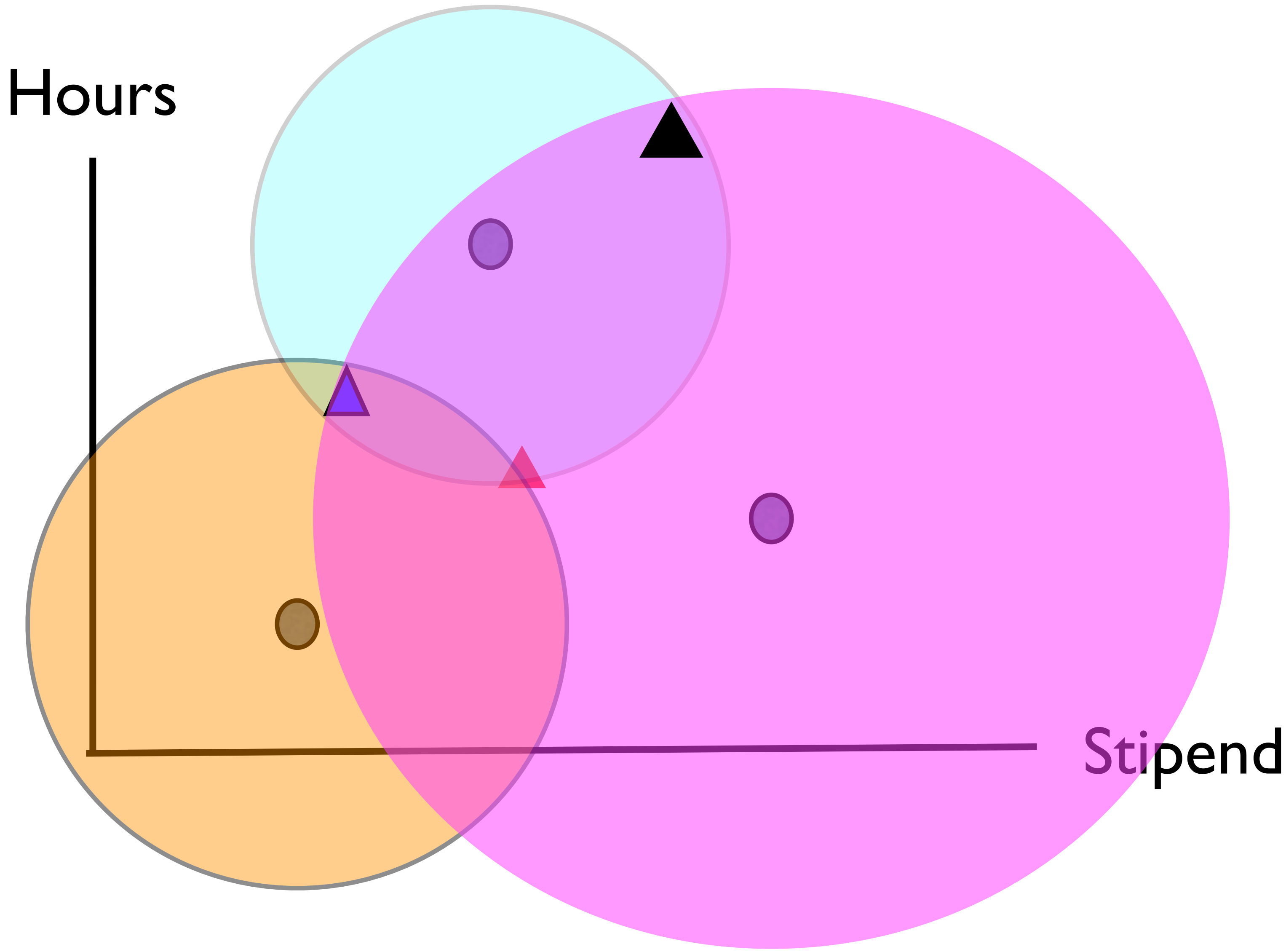
Shifting coalitions

Core? Here the core is empty



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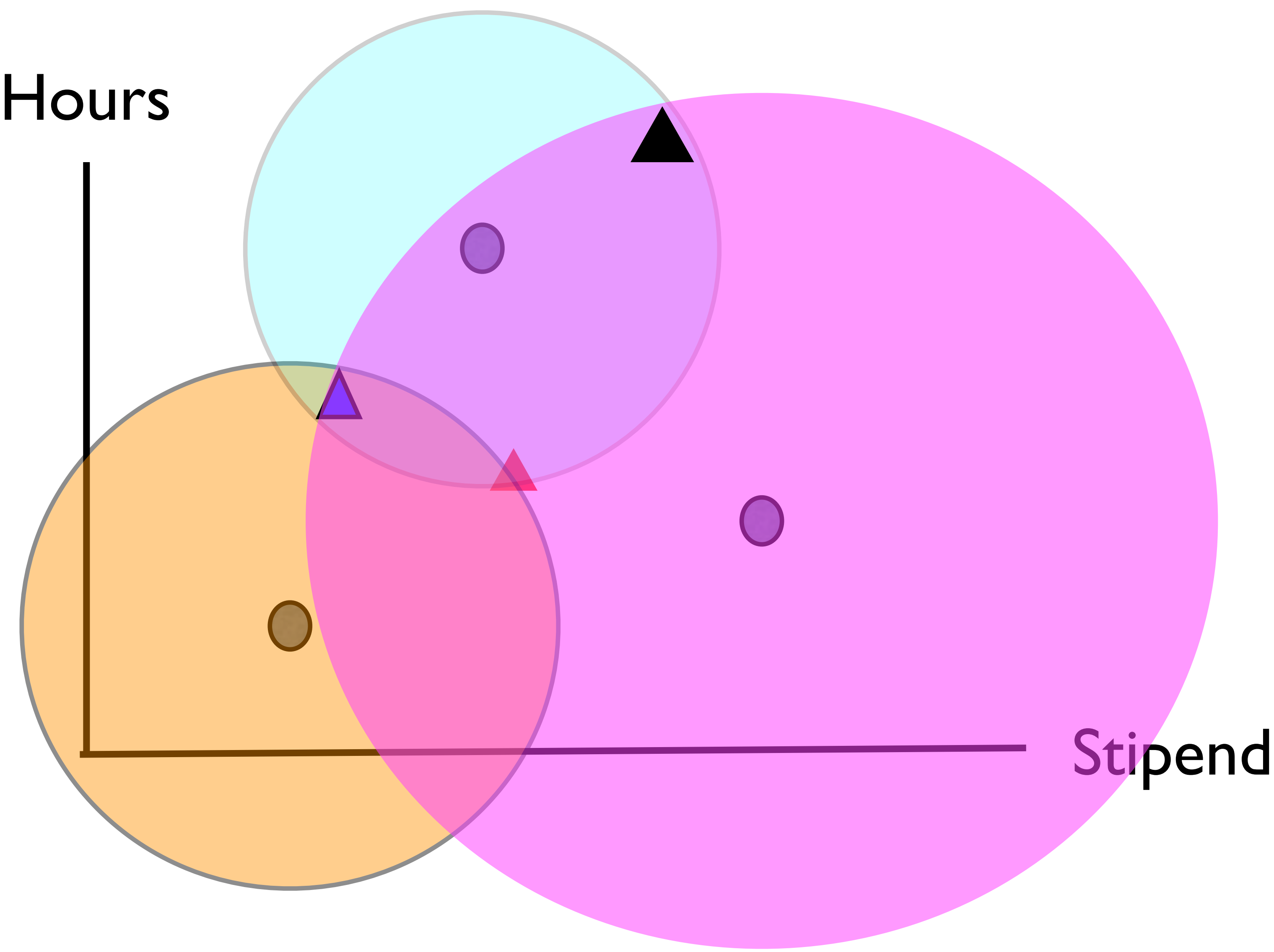

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Idea for proof: Differential topology

Examples:
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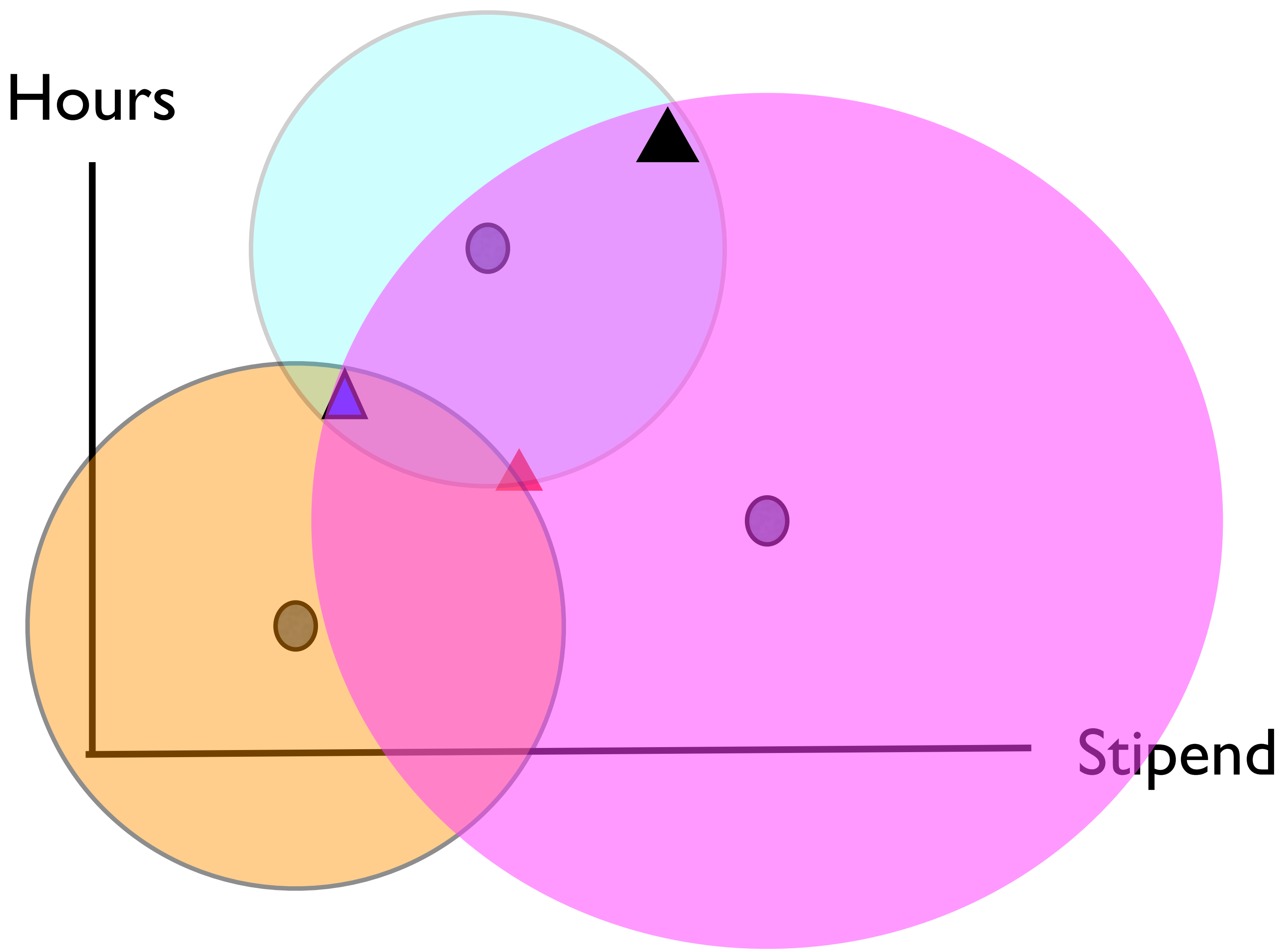
Shifting coalitions
Good intensions:
NSF, engineering, with "continued improvement"

Core? Here the core is empty



q-rule (supermajority vote)

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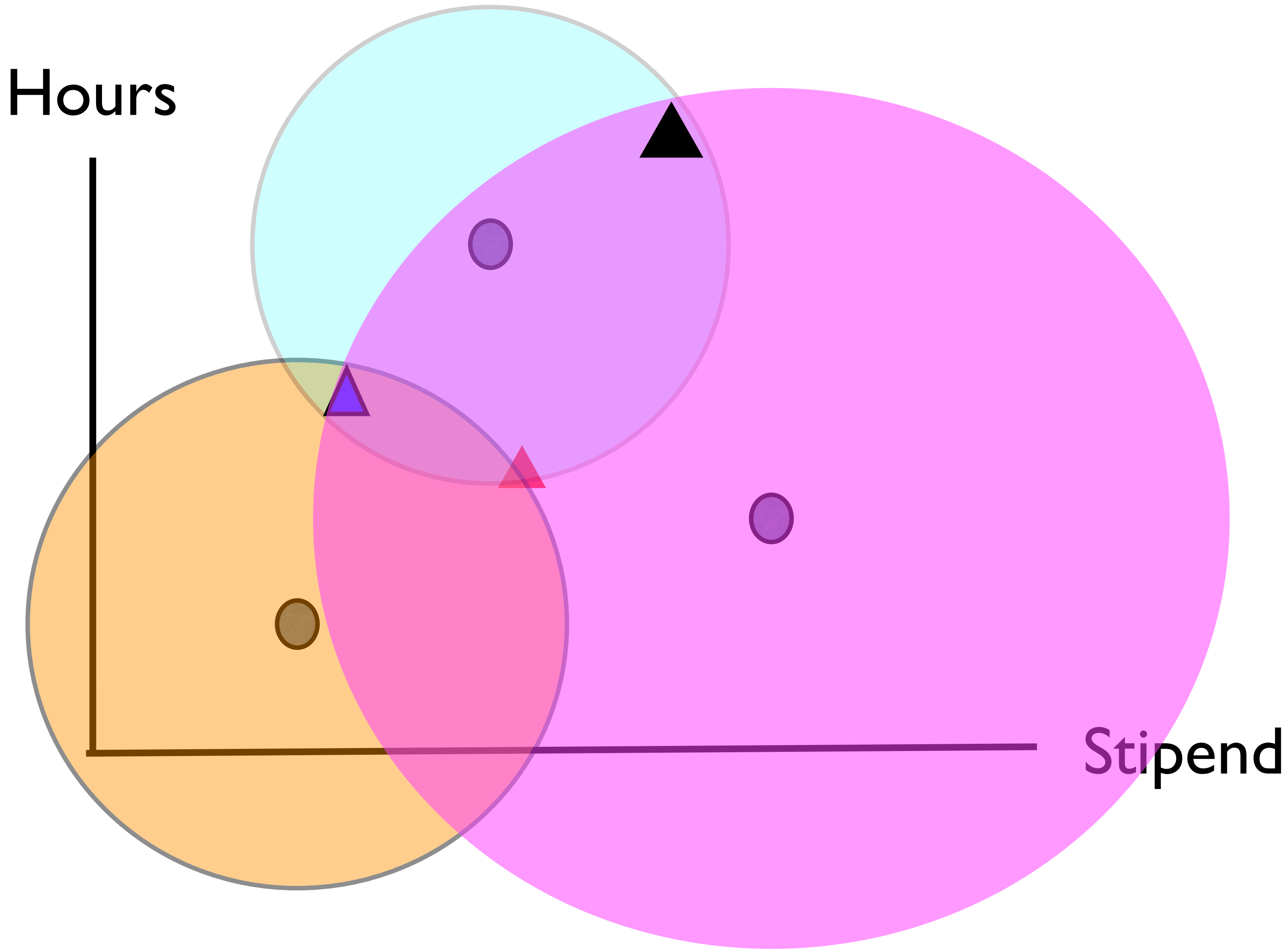

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q-rule (supermajority vote)
to win, need at least q (quota) votes.

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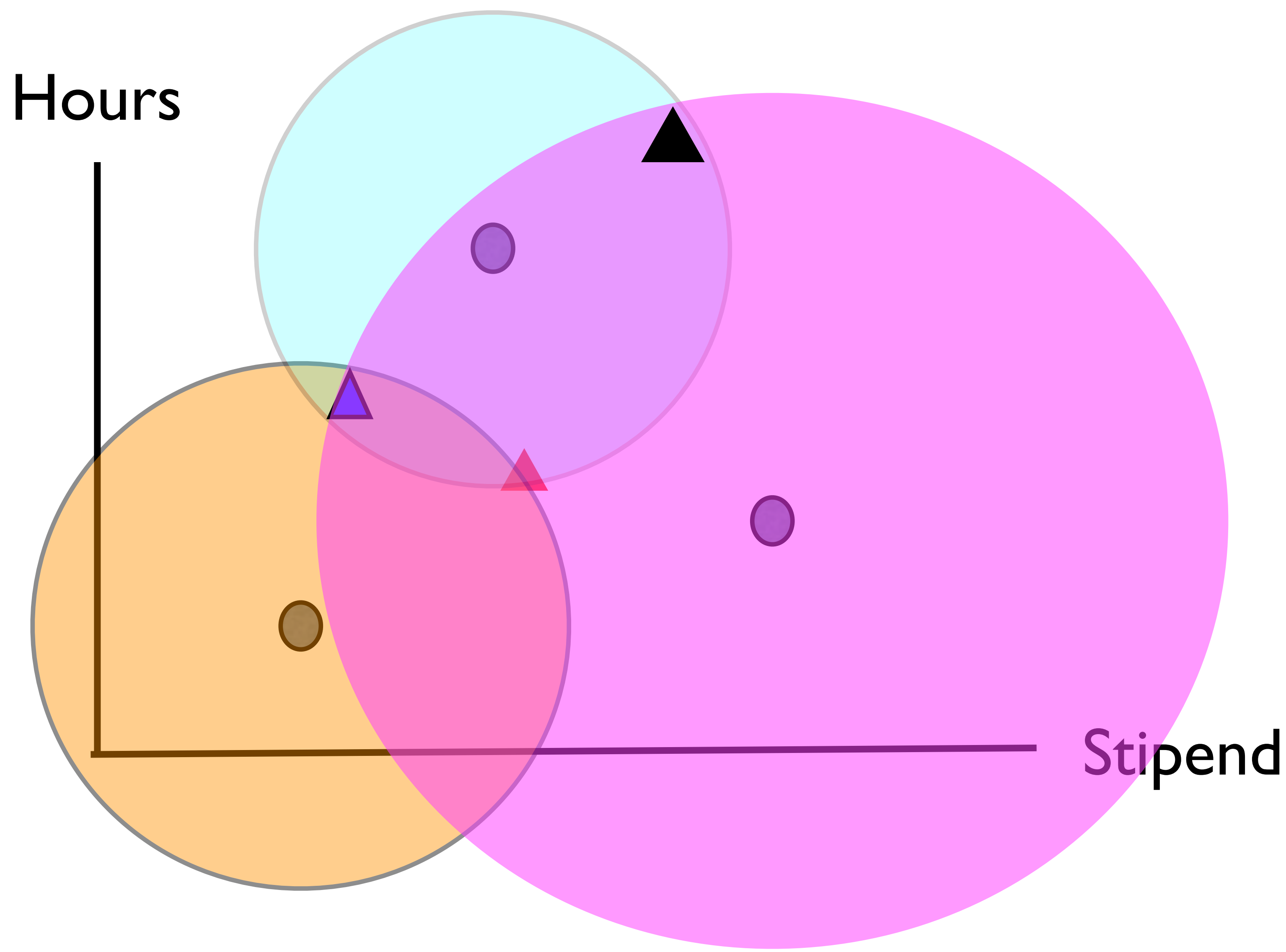

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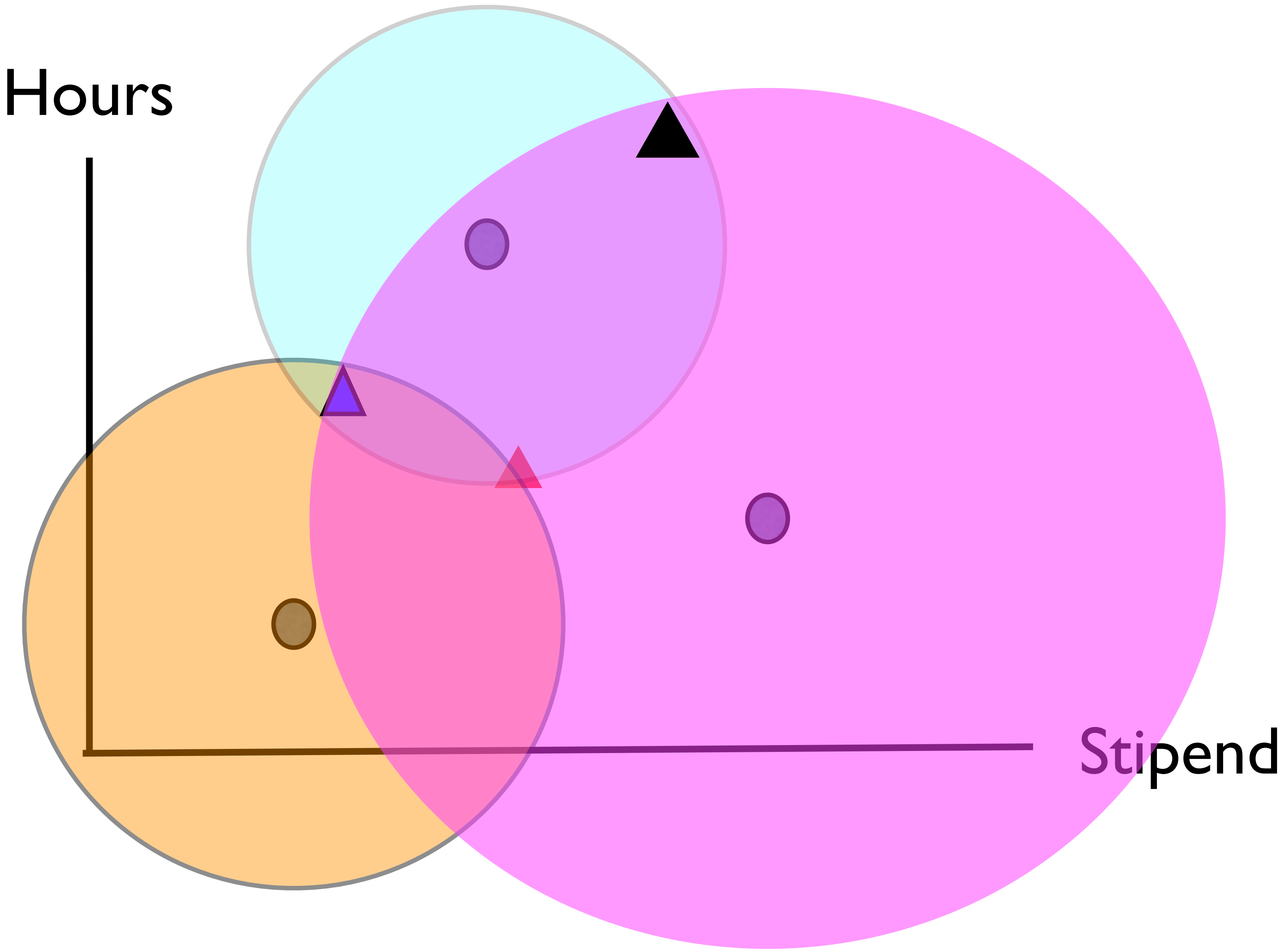
to win, need at least q (quota) votes.
Example: US Senate where q=60

Core? Here the core is empty



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Tataru: For q-rule, empty core, same result as for McKelvey

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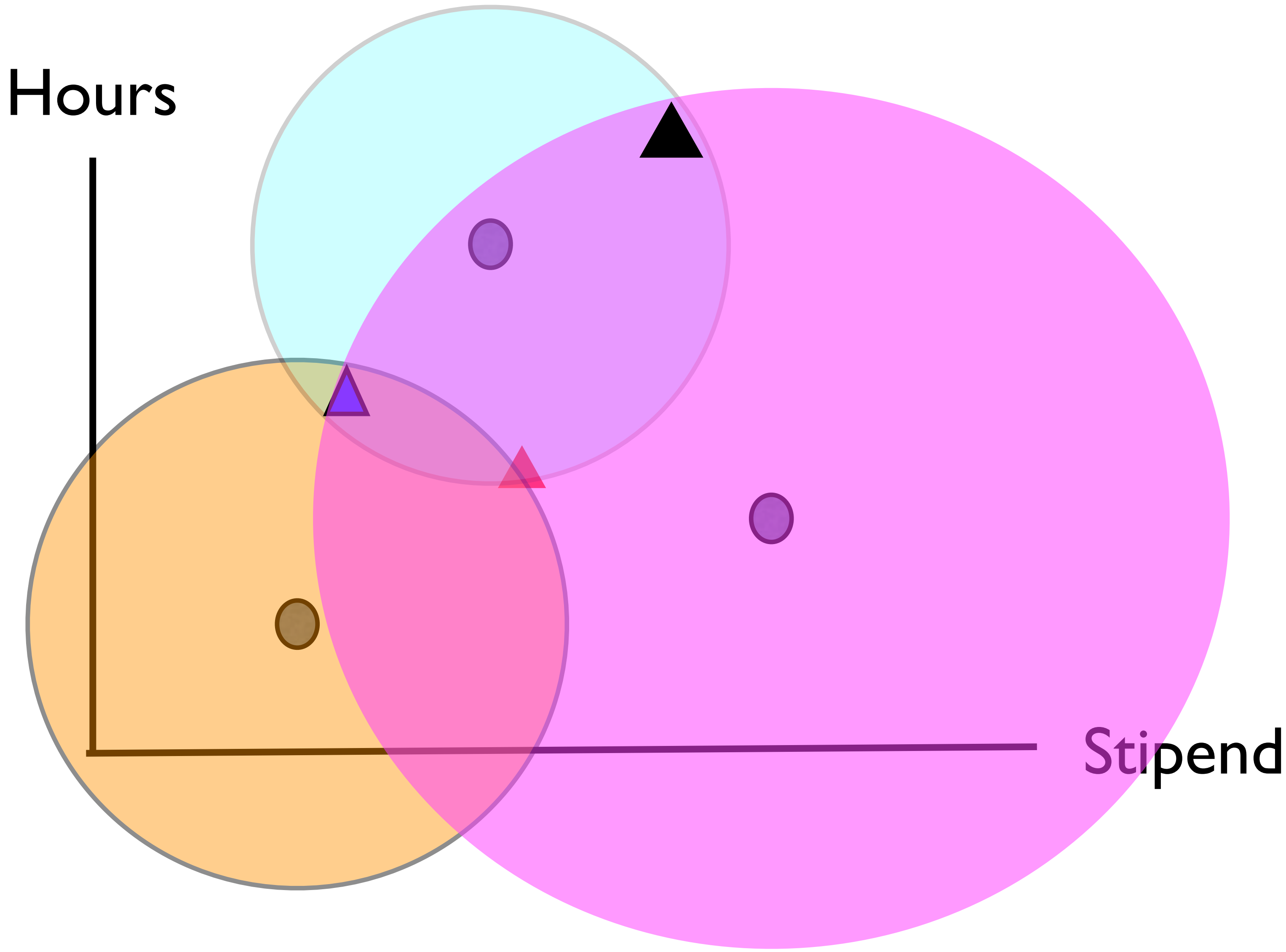

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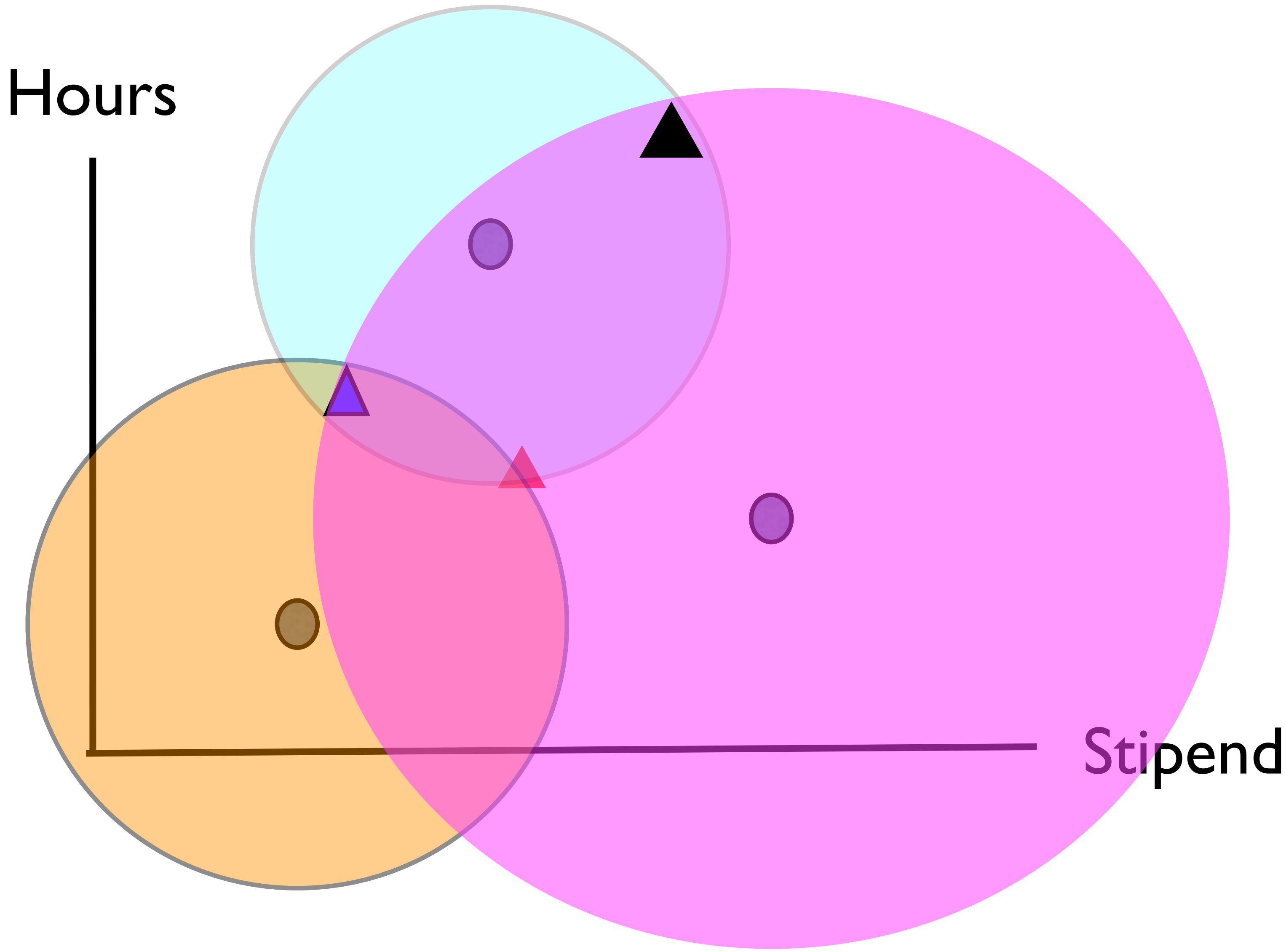

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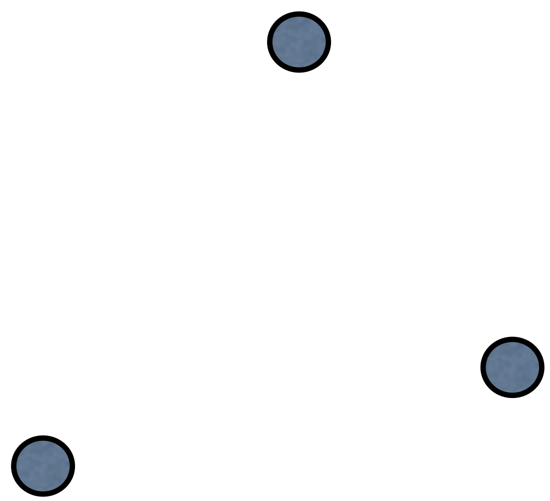
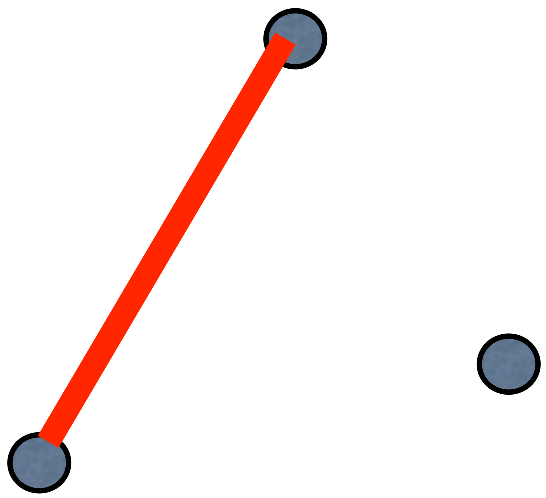
Tataru: For q-rule, empty core, same result as for McKelvey
Idea of proof:
symmetry group orbits of sets

Tools and a question

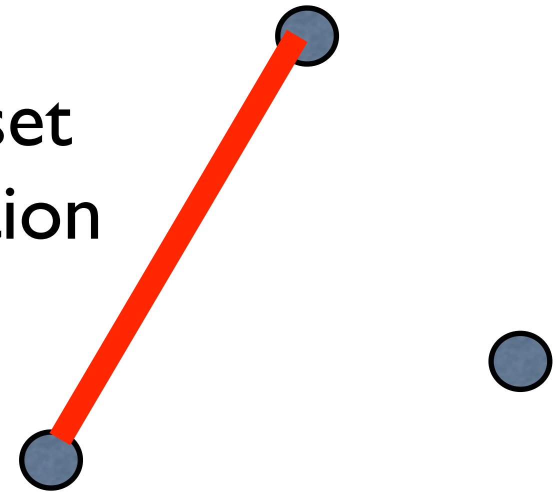


Tools and a question

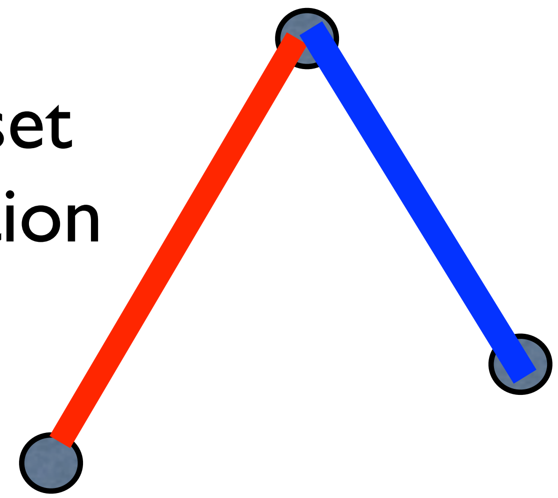


Tools and a question

Pareto set
for coalition



Tools and a question



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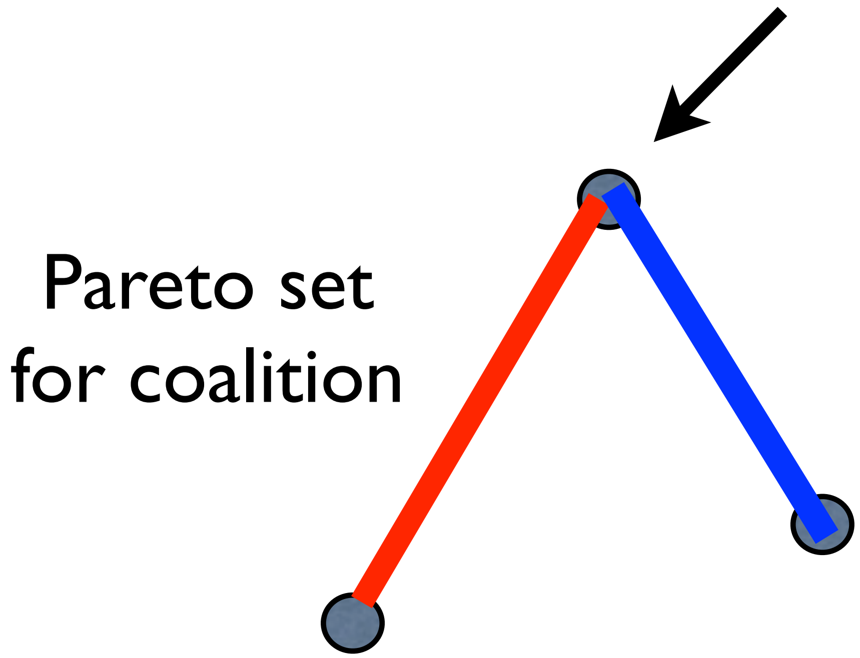
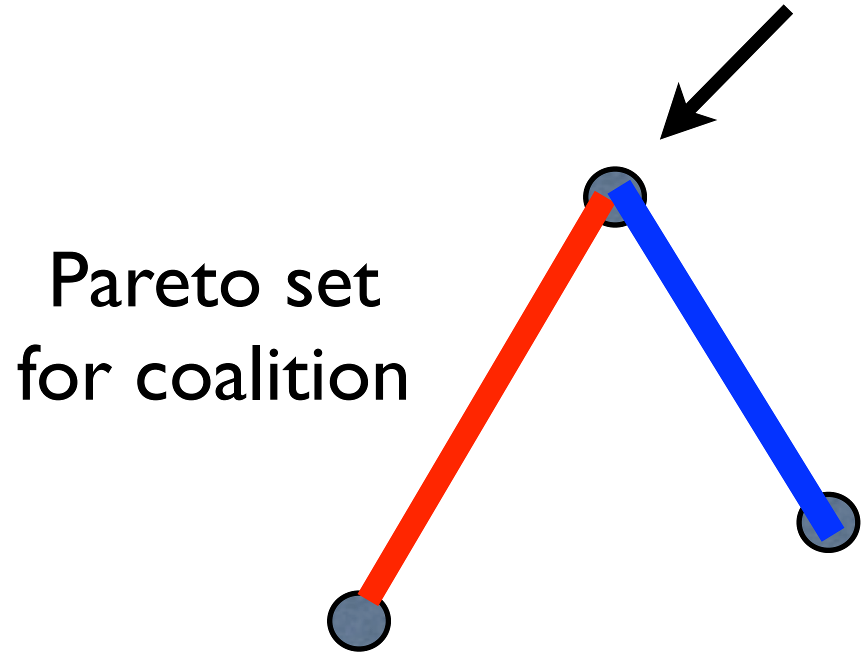


Tools and a question

Sen. Jeffords, VT



Tools and a question

Pareto set
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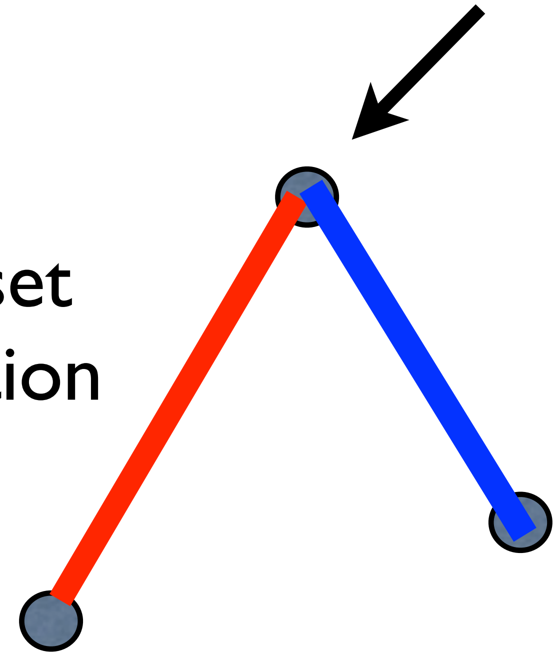
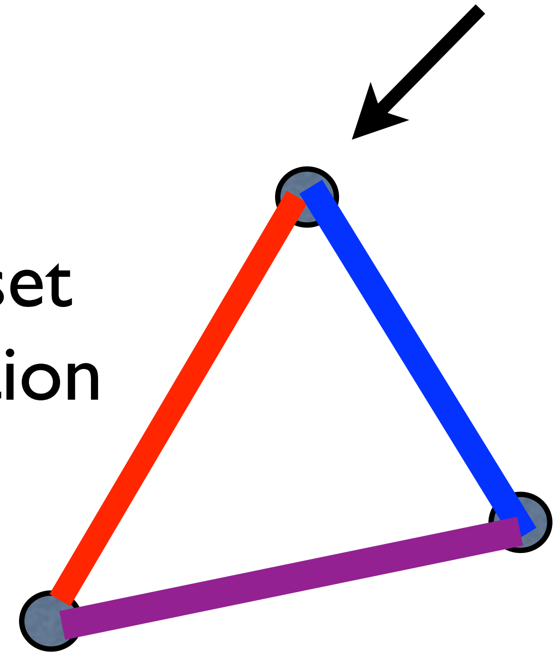


Sen. Jeffords, VT
Core is the intersection of
Pareto sets

Tools and a question

Pareto set
for coalition



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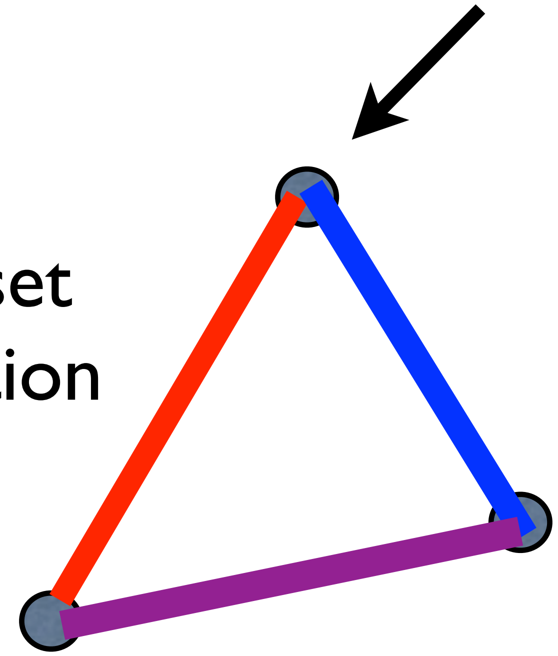

Core is empty!

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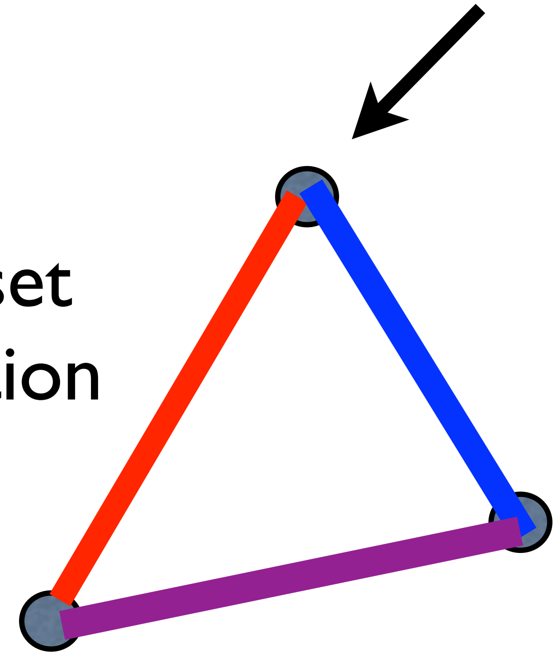
Tools and a question

Pareto set for coalition



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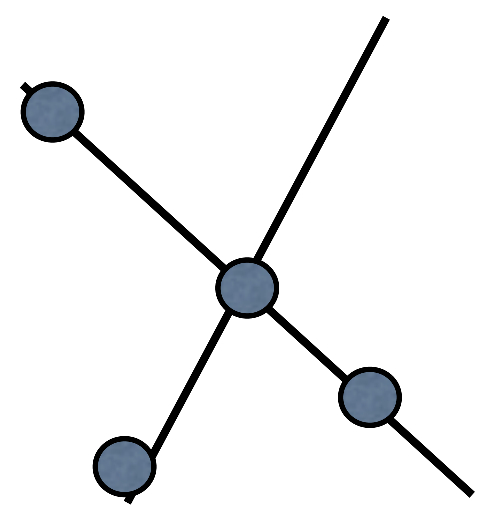

Tools and a question

Pareto set
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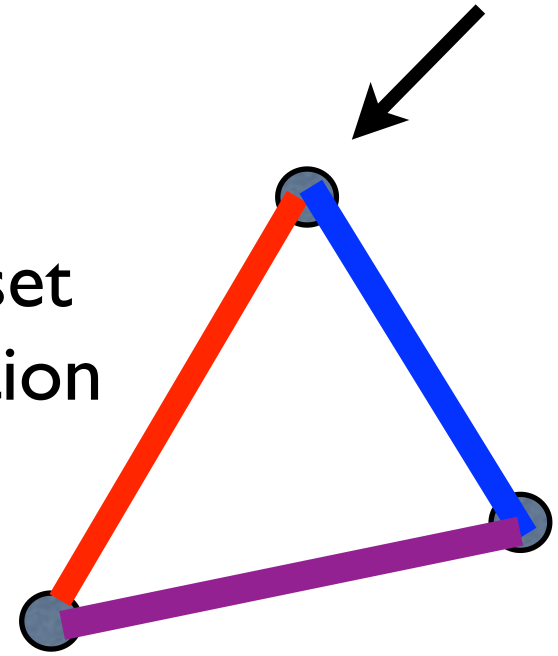

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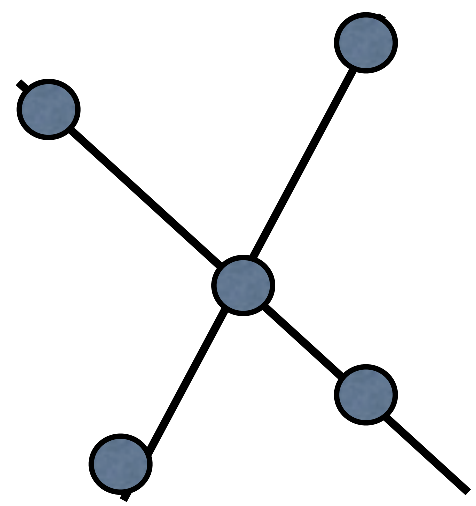

Tools and a question

Pareto set
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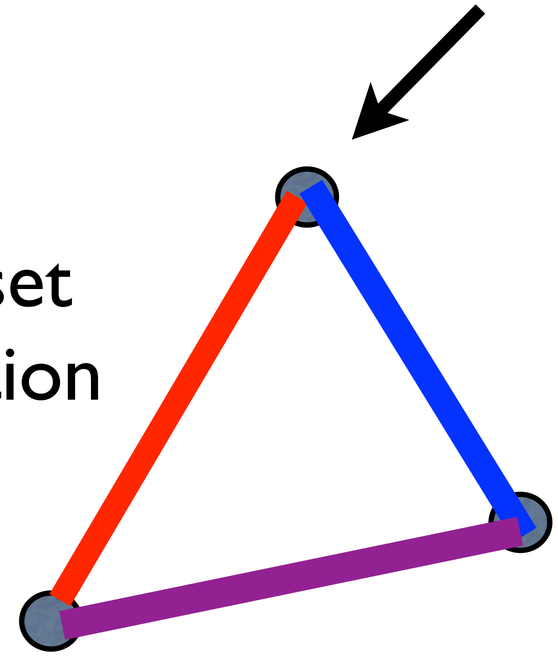

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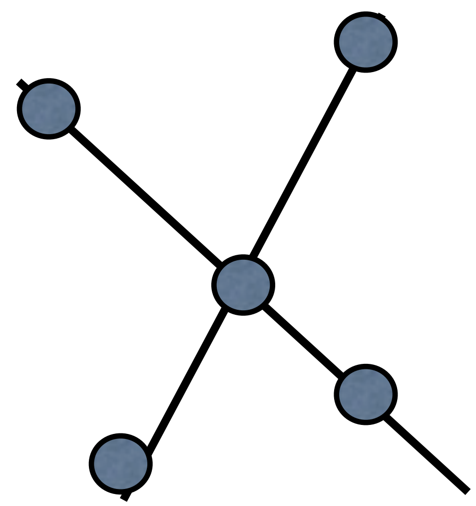

Pareto sets:

Tools and a question

Pareto set
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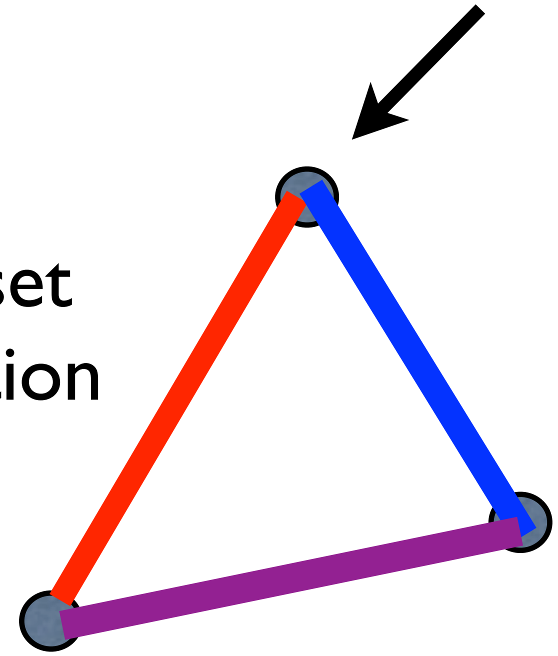

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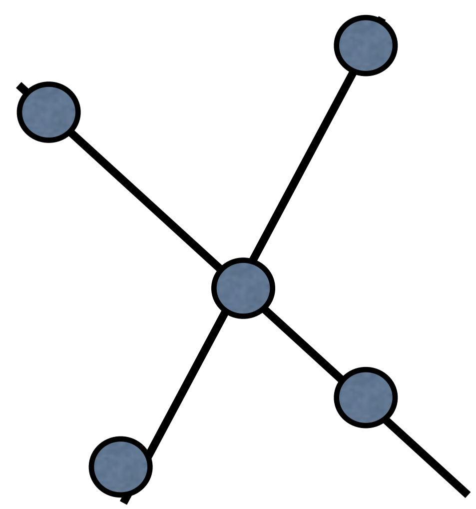
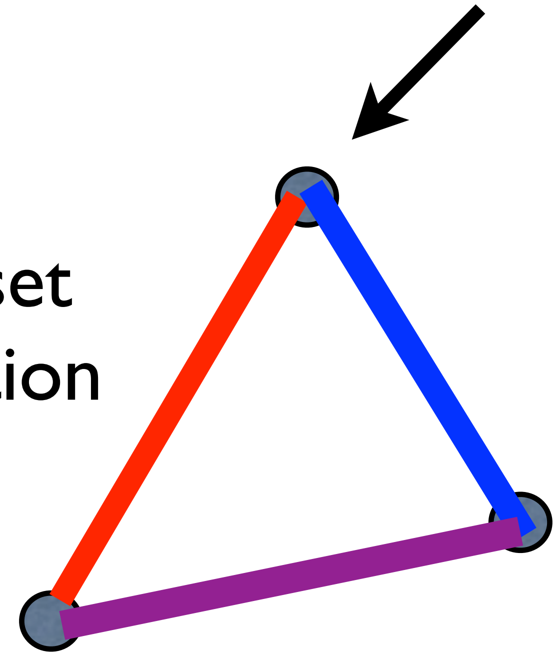


Pareto sets:
winning coalition has three
voters

Tools and a question

Pareto set
for coalition



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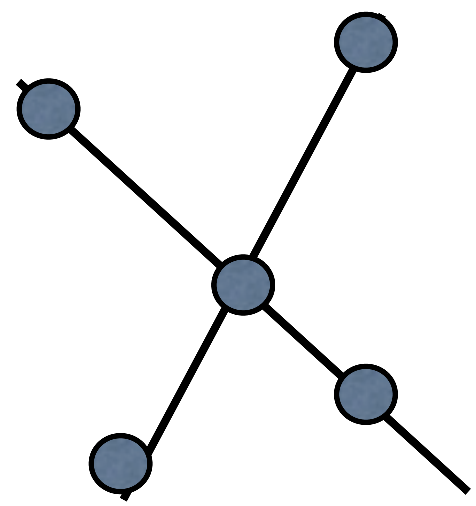
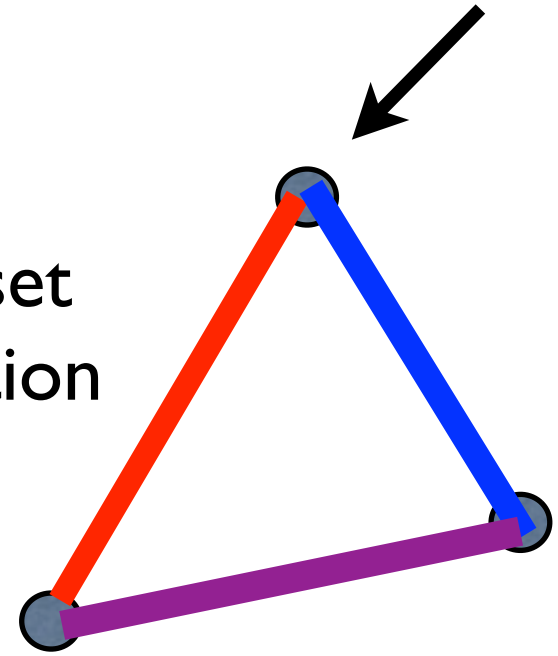


Pareto sets:
winning coalition has three
voters
triangles

Tools and a question

Pareto set
for coalition



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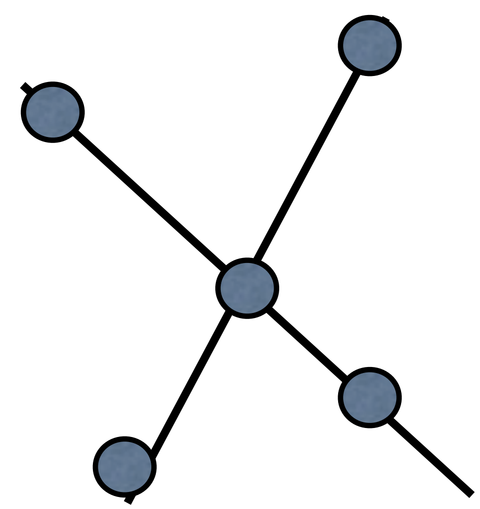
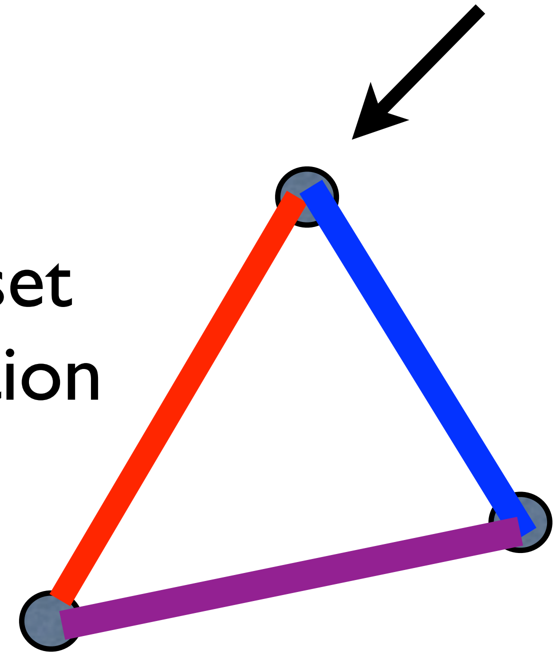


Pareto sets:
winning coalition has three
voters
triangles
All intersect at midpoint

Tools and a question

Sen. Jeffords, VT
Core is the intersection of
Pareto sets

Pareto set
for coalition



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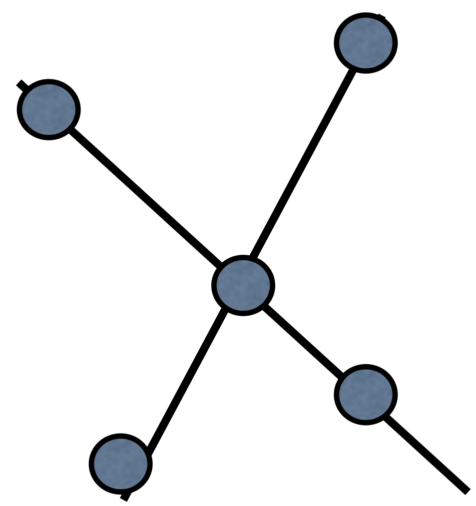

Pareto sets:
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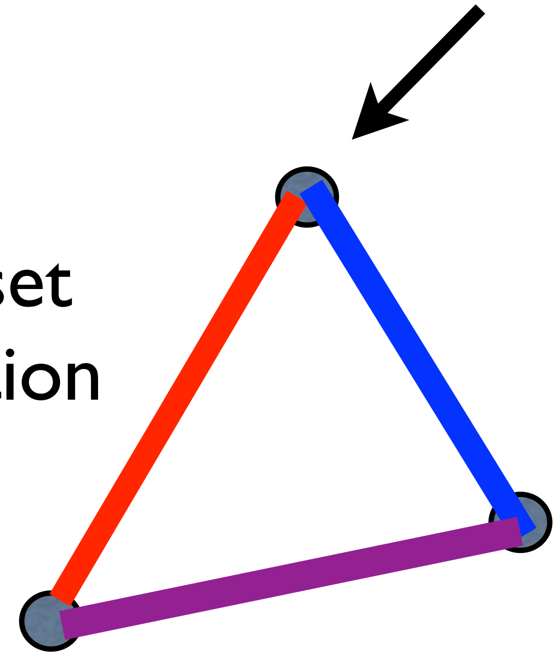
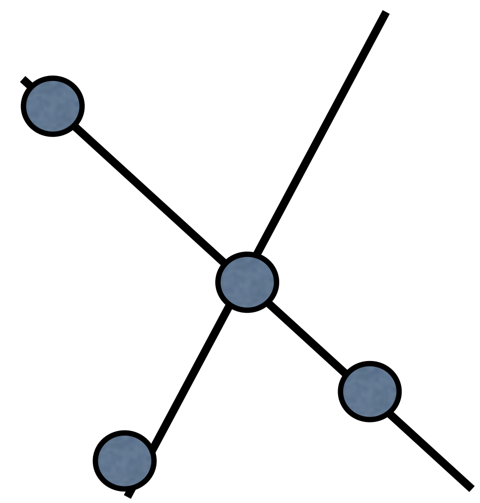
Tools and a question



Pareto set for coalition

Core is empty!

Sen. Jeffords, VT
Core is the intersection of Pareto sets



Pareto sets:
winning coalition has three voters
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All intersect at midpoint
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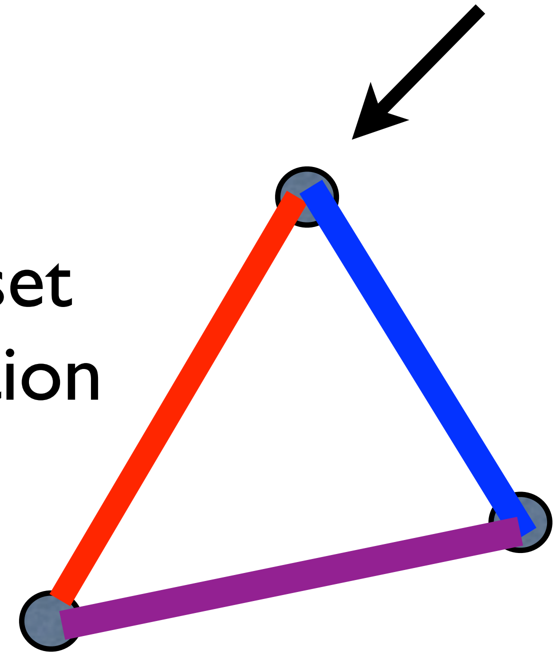
Tools and a question

Pareto set
for coalition



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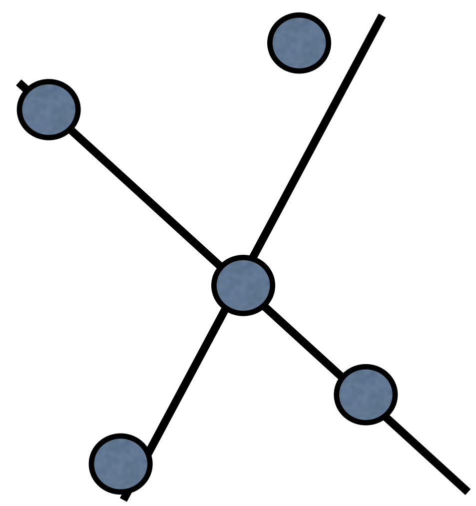

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Tools and a question

Pareto set
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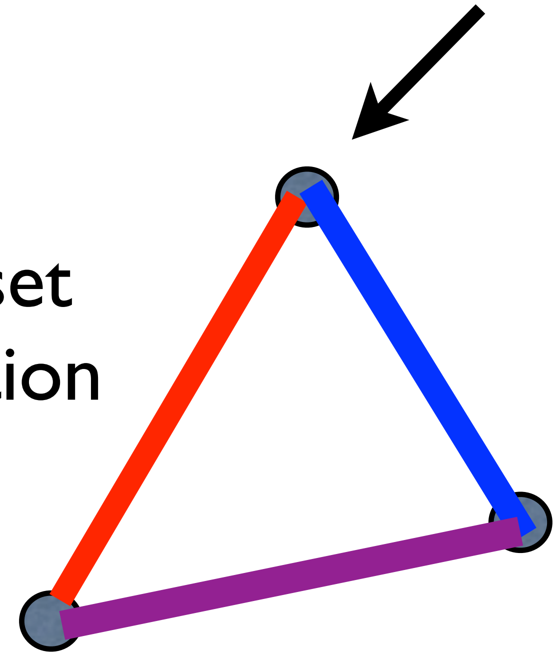
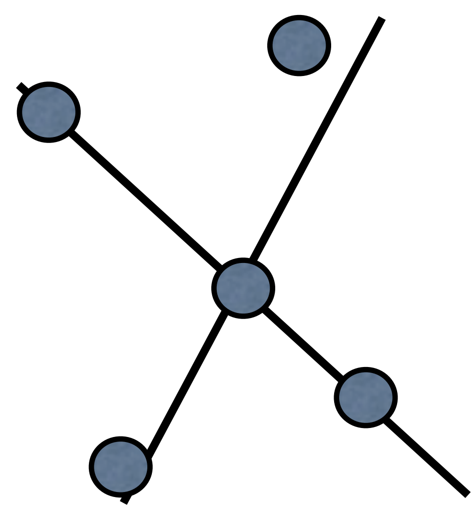


Core is empty!

Now, triangles do not
intersect

Sen. Jeffords, VT
Core is the intersection of
Pareto sets



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Tools and a question

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Pareto set
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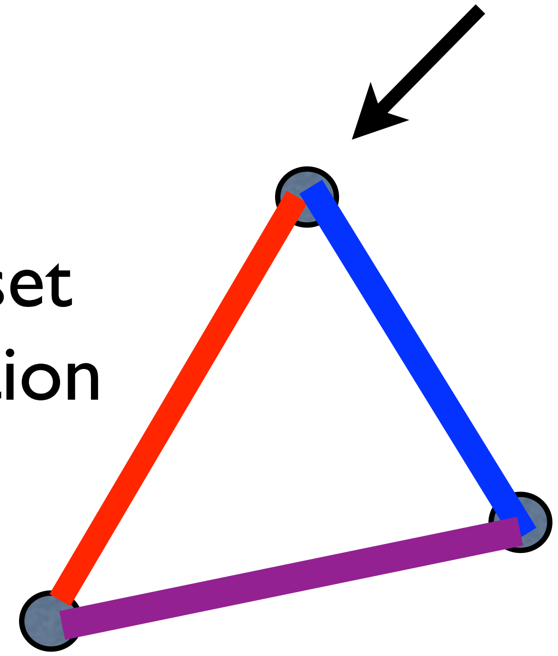

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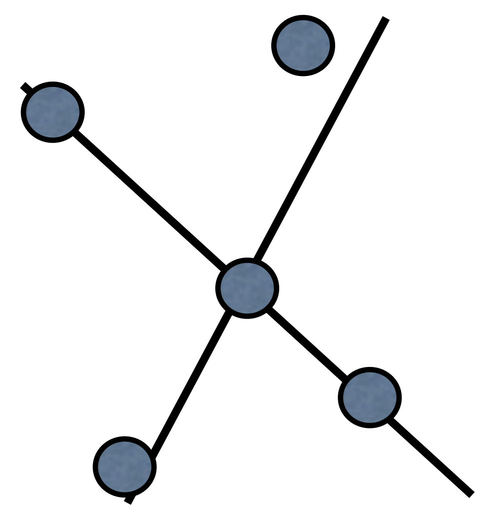

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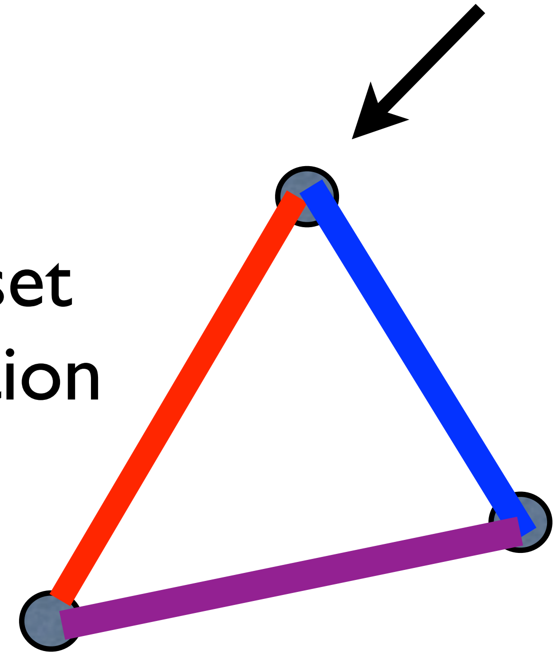
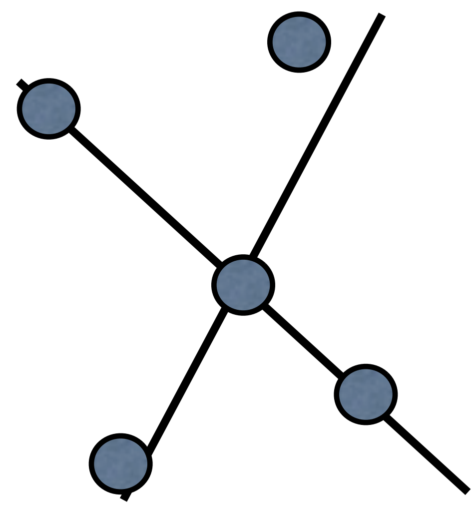


Pareto set
for coalition

Core is empty!

Sen. Jeffords, VT
Core is the intersection of
Pareto sets

Now, triangles do not
intersect
Core is empty
For core to be meaningful
must be



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Tools and a question

Pareto set
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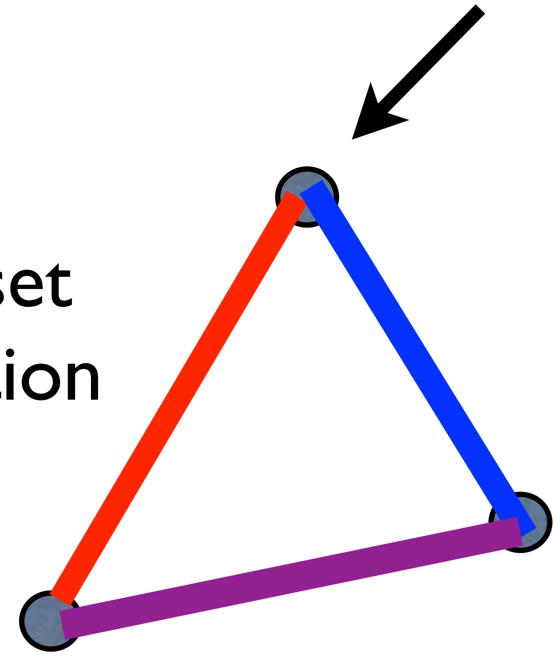

Core is empty!

Now, triangles do not
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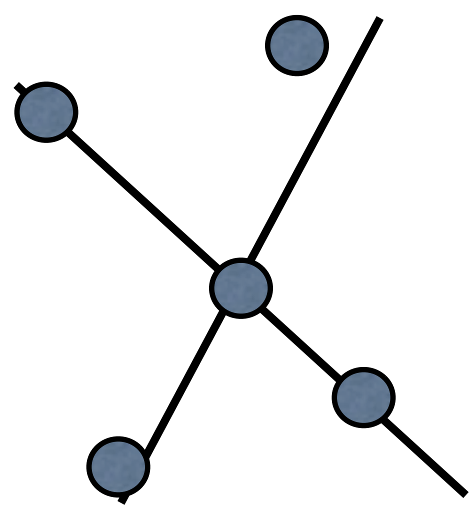
Core is empty
For core to be meaningful
must be
structurally stable

Sen. Jeffords, VT
Core is the intersection of
Pareto sets



Pareto sets:
winning coalition has three
voters
triangles
All intersect at midpoint
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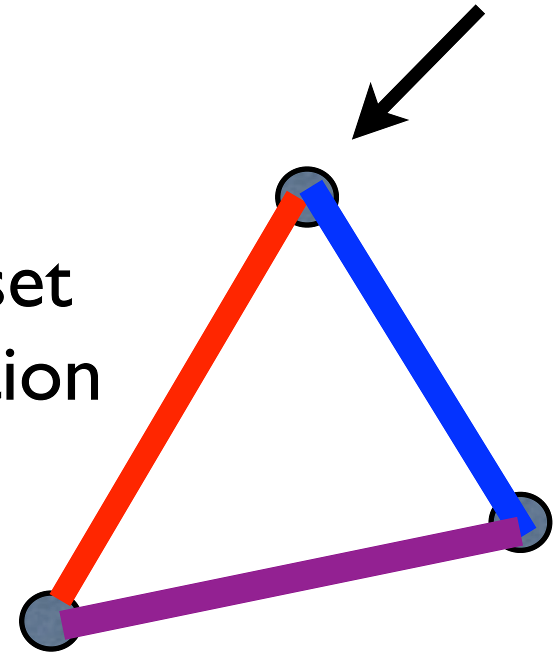
Tools and a question



Pareto set
for coalition

Core is empty!

Now, triangles do not
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Sen. Jeffords, VT
Core is the intersection of
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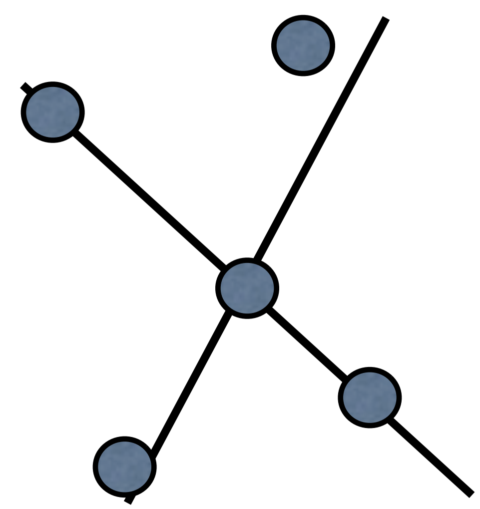

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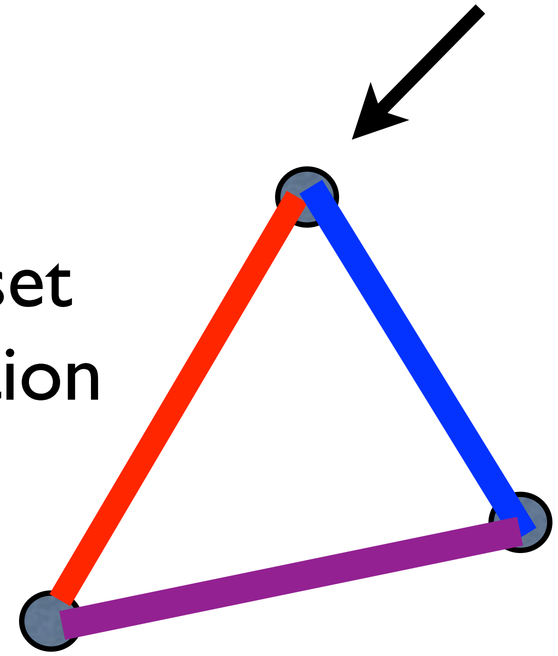

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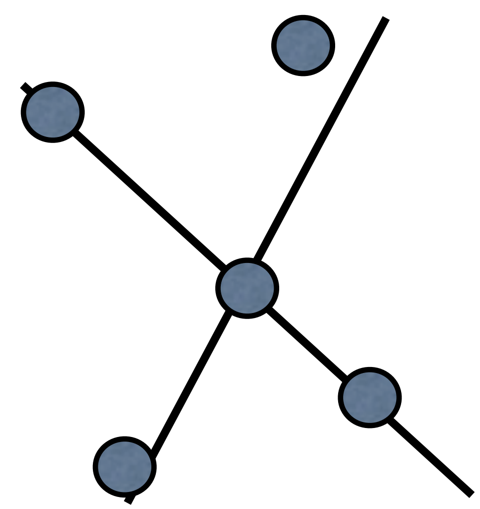

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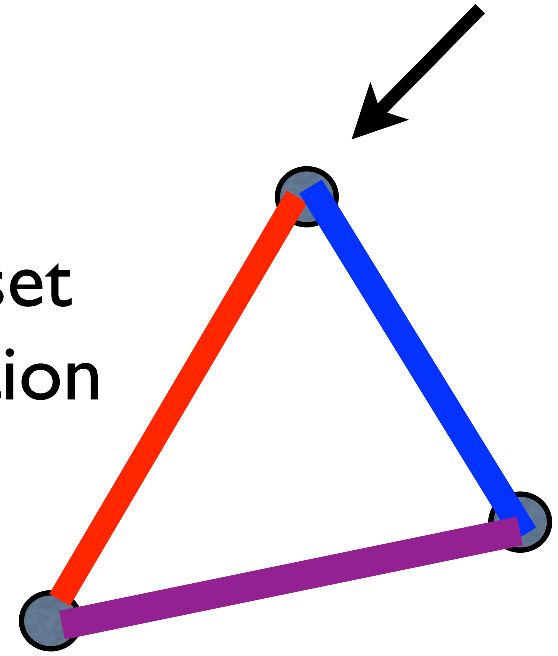

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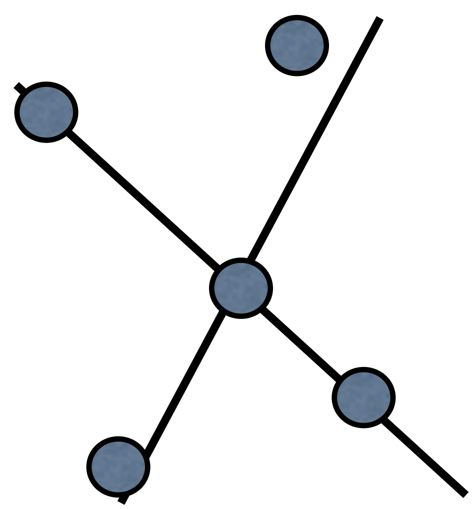

Pareto sets:
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Must expect tools from these areas will provide insights
Early attempts by McKelvey and Scholfield

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⅔ rule So, if 120 voters, need 80 to win, 40 on losing side.

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$k= 2q-n = 2(80) - 120 = 40$, or the number needed to change outcome.

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I will come to your group before your next election.

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You tell me who you want to win.

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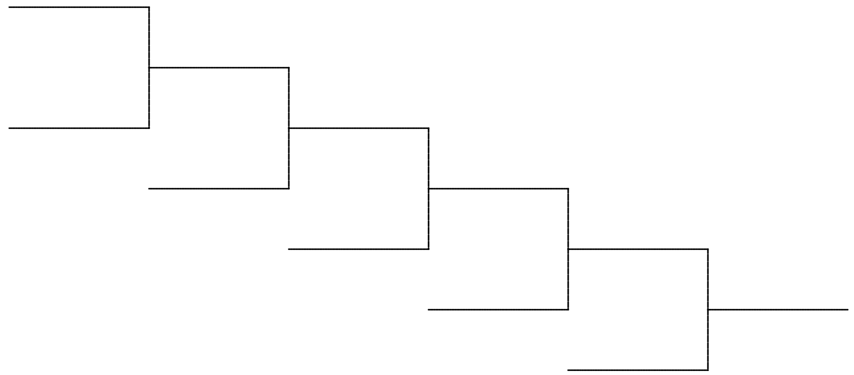

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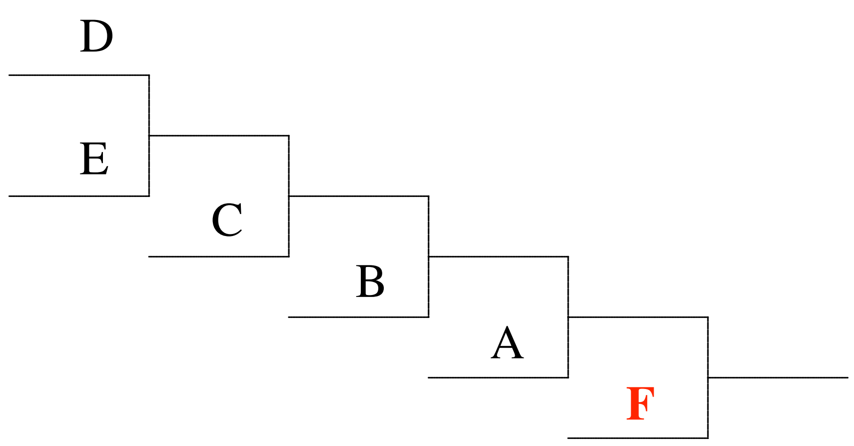

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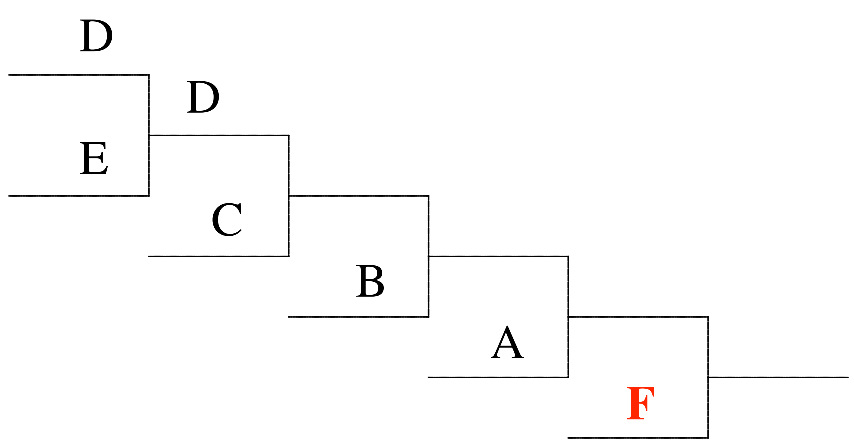

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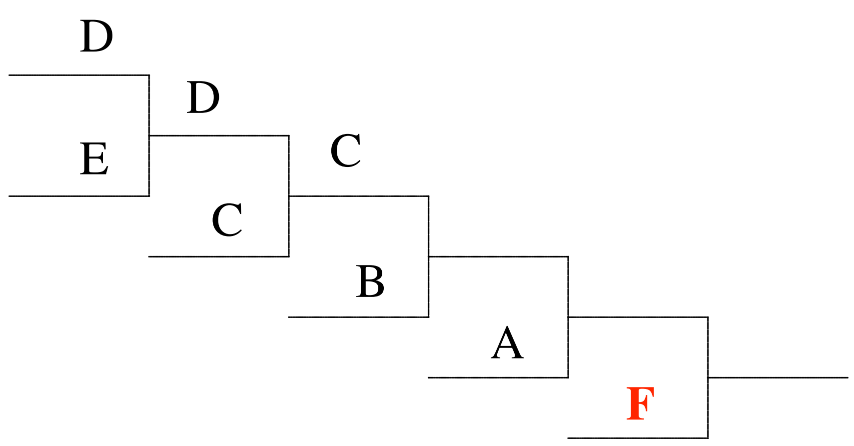

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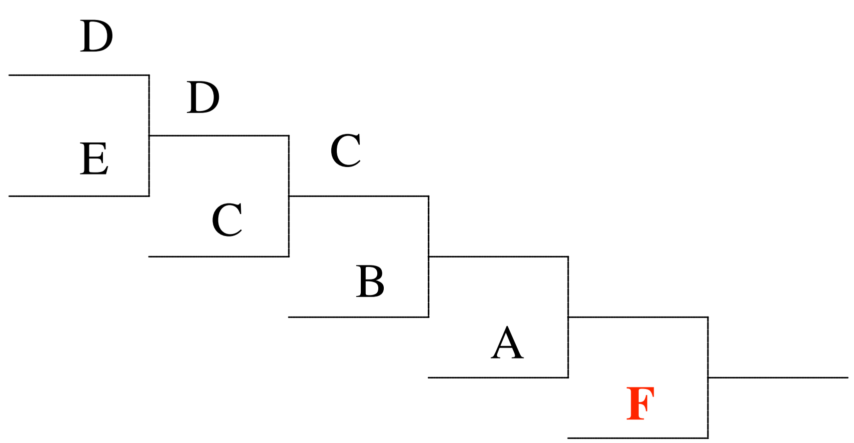

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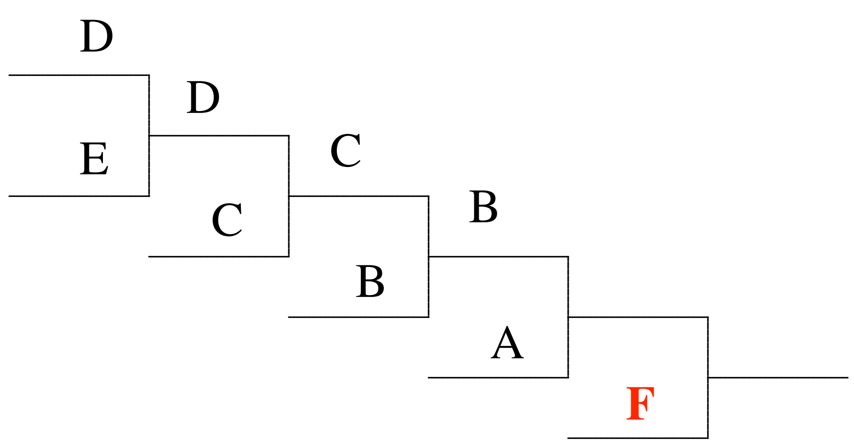

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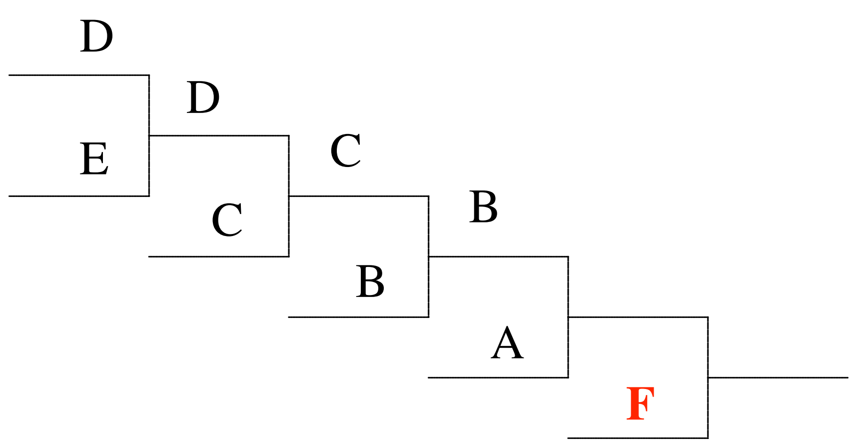

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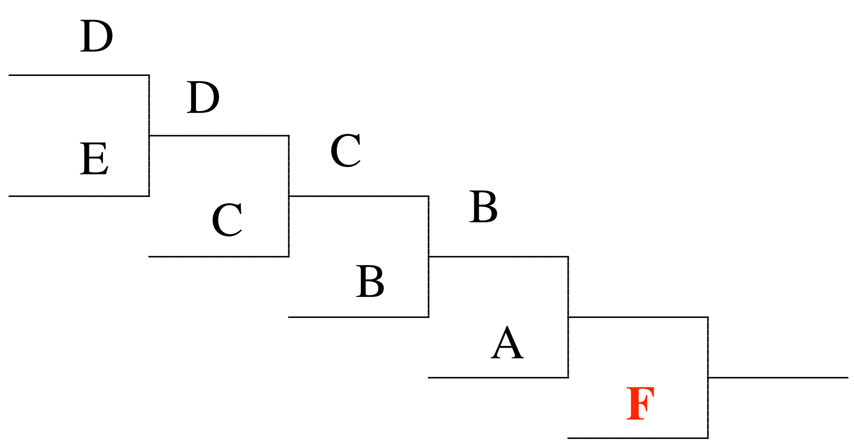

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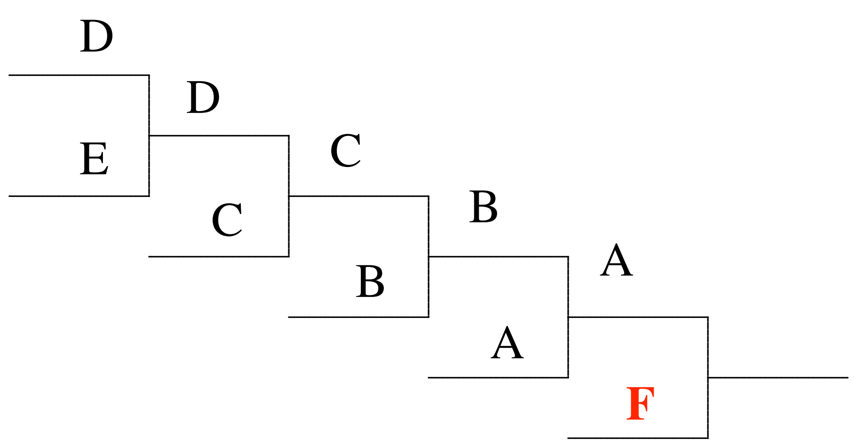

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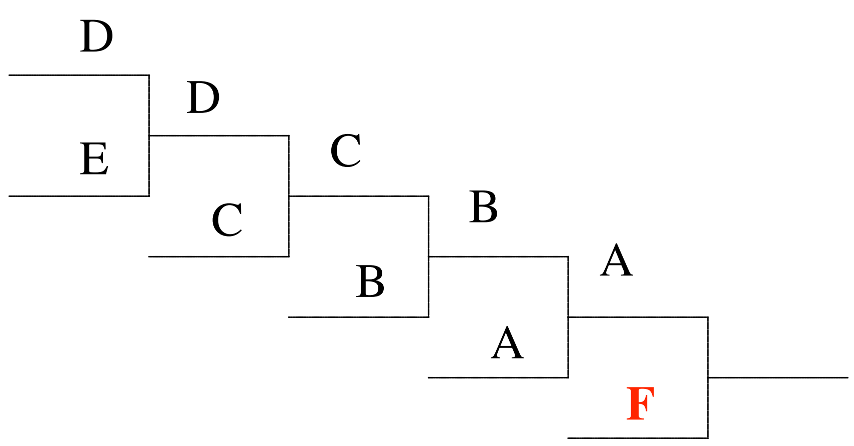

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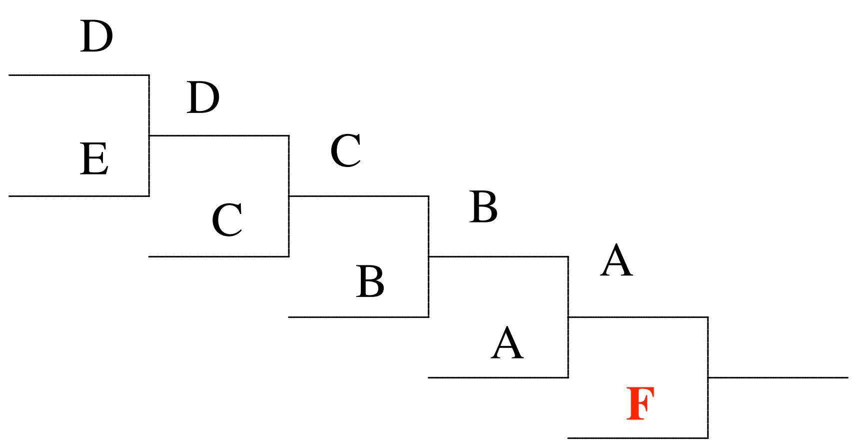

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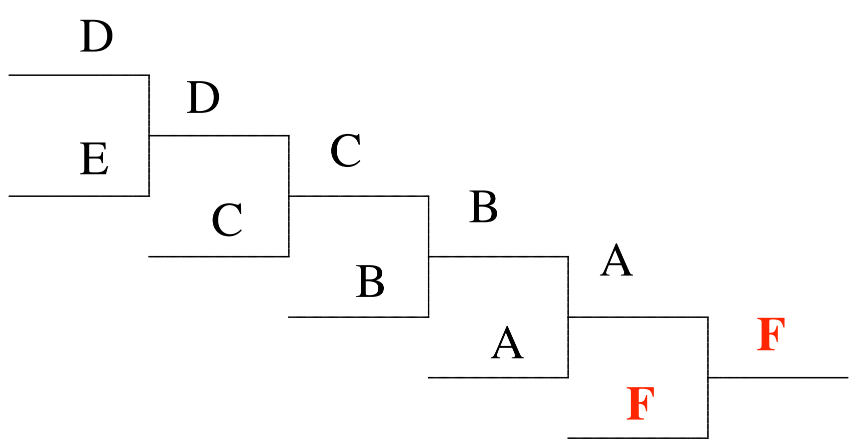

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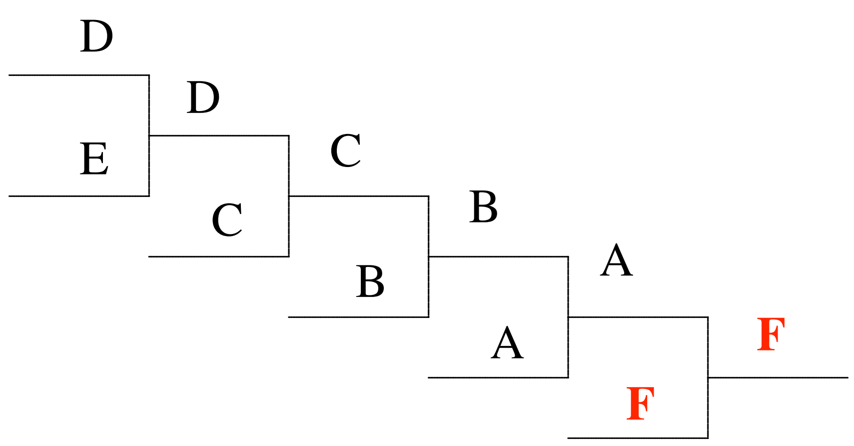

Fred wins by a landslide!!

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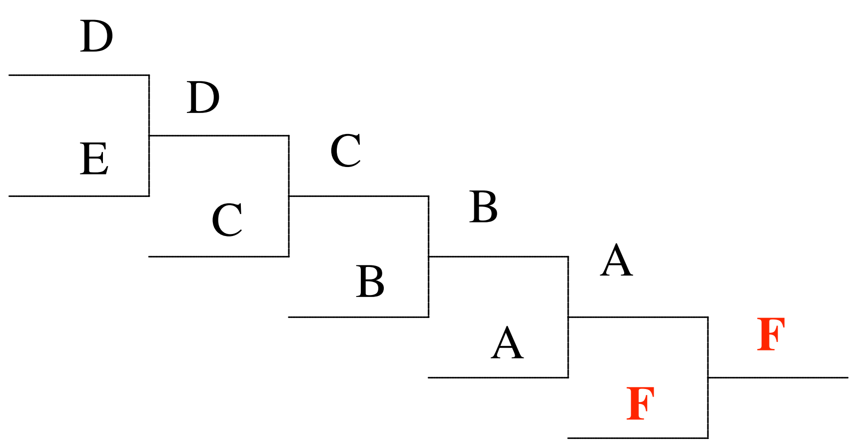

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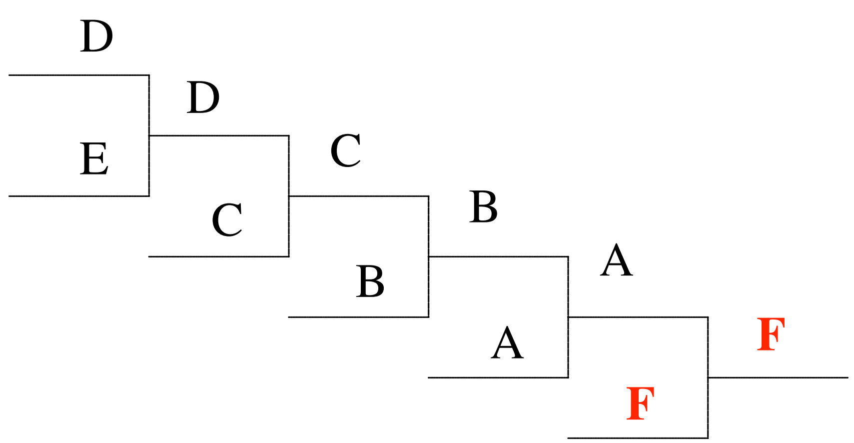

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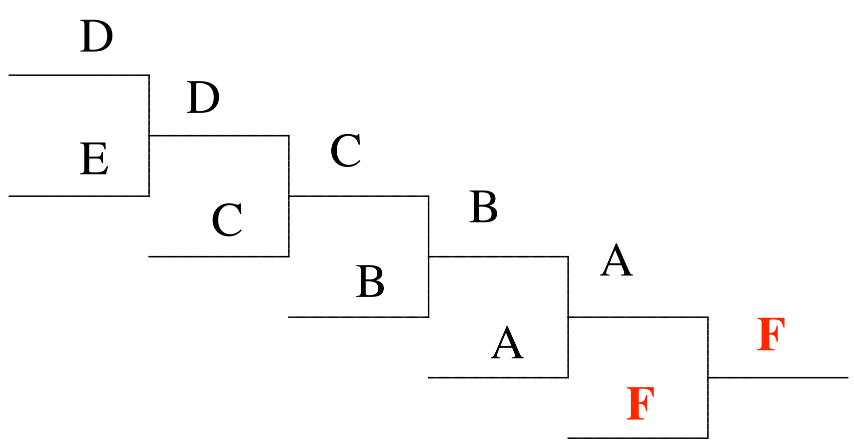

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Mathematics?

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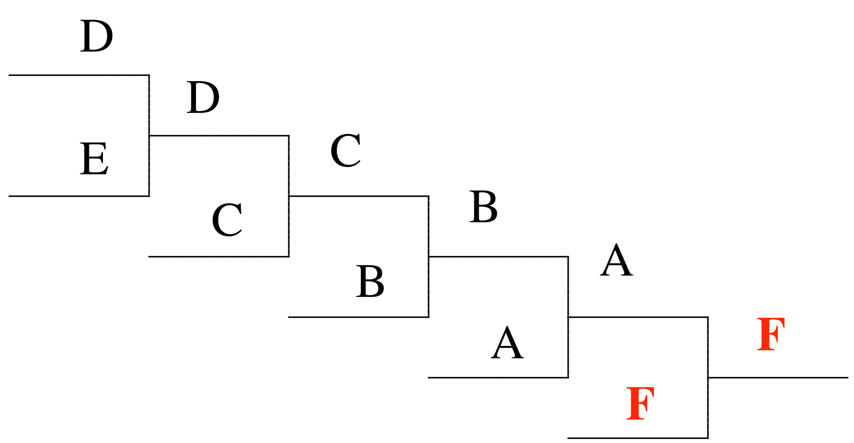

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Mathematics? **Ranking Wheel**

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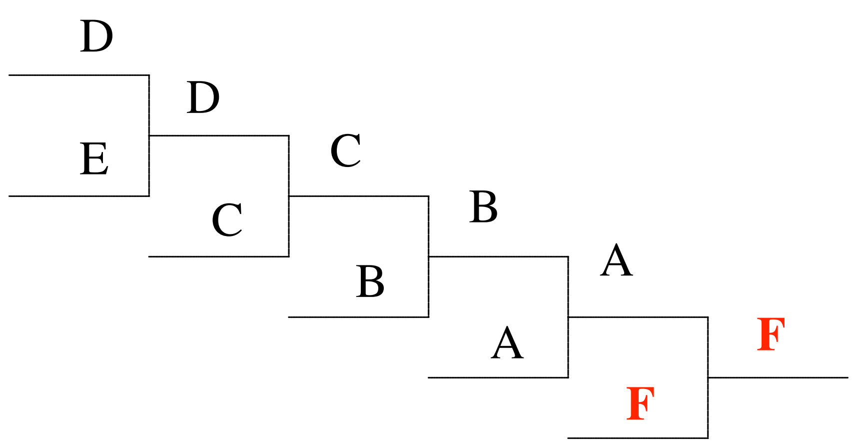

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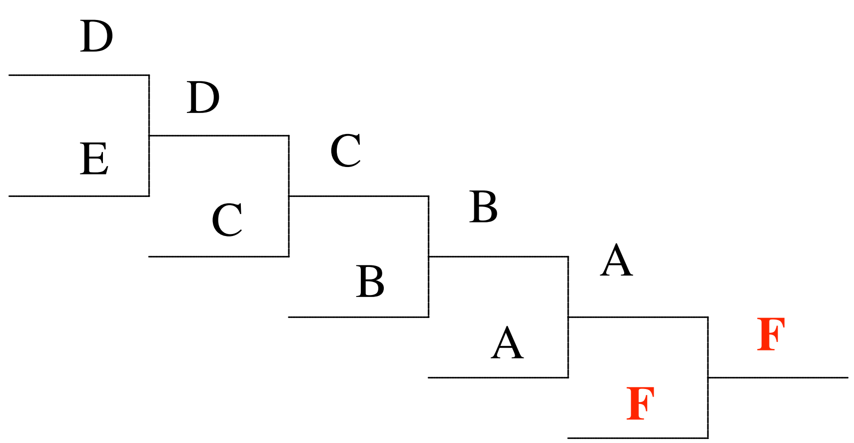

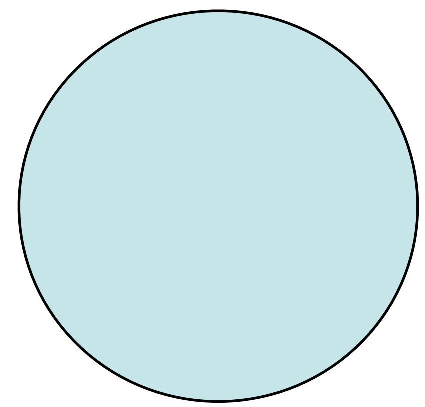

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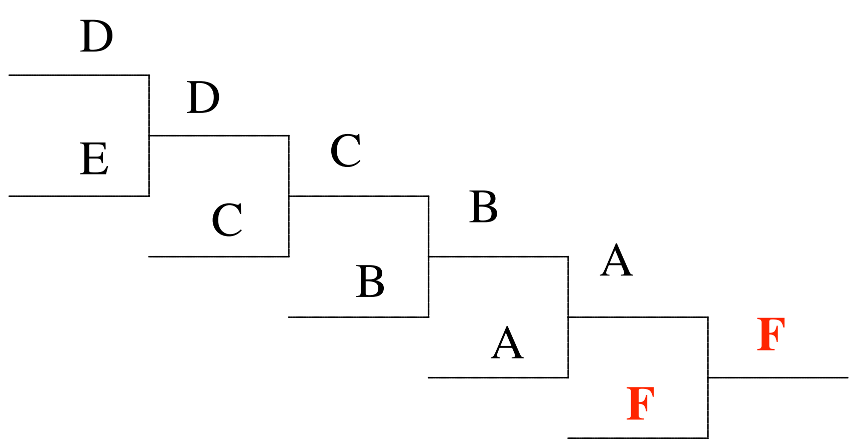

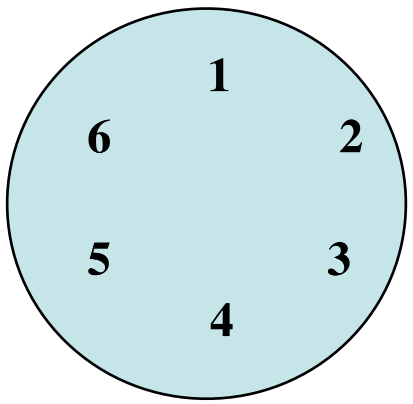

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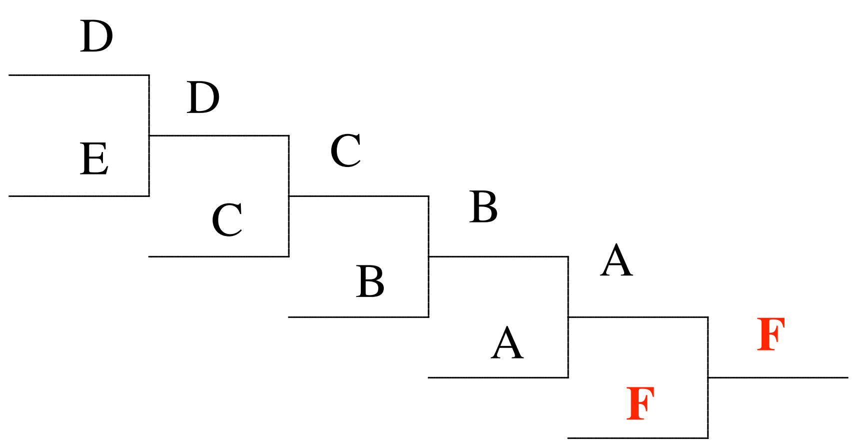

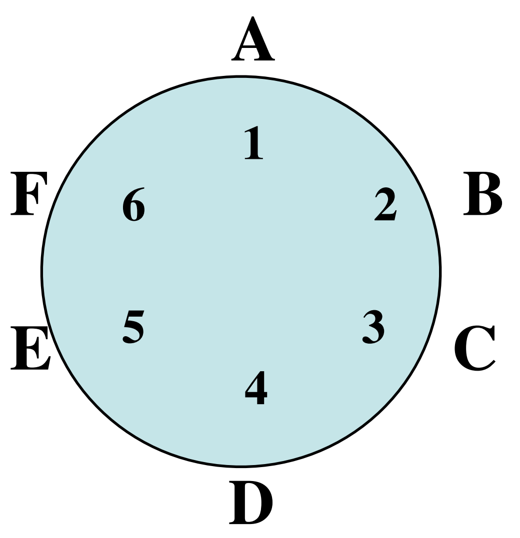

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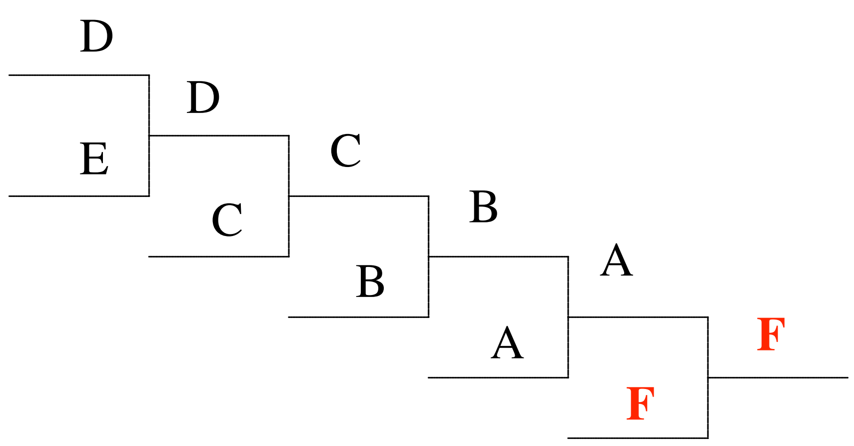

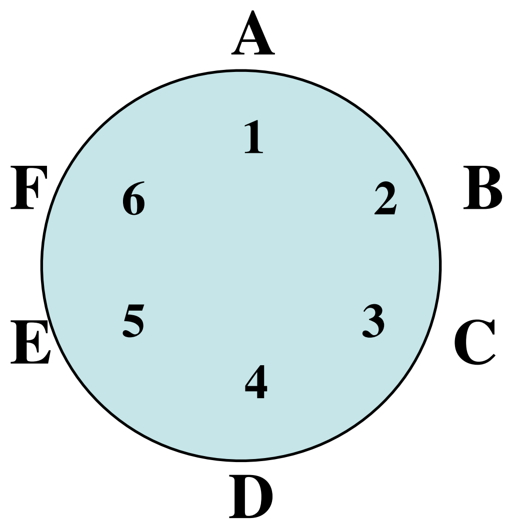

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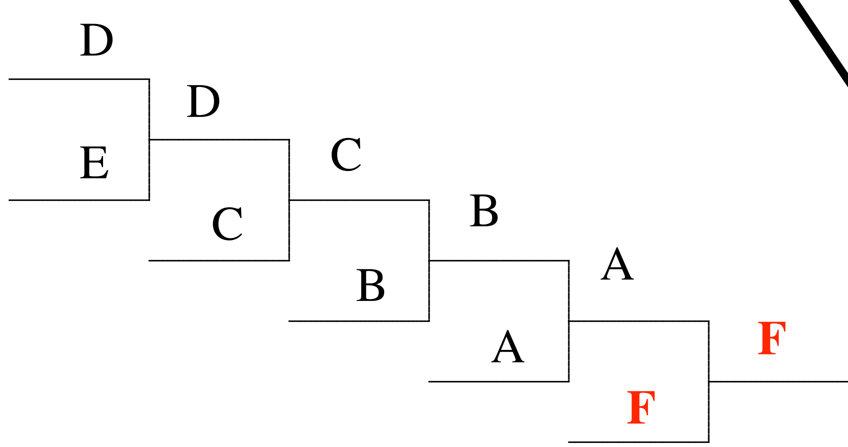

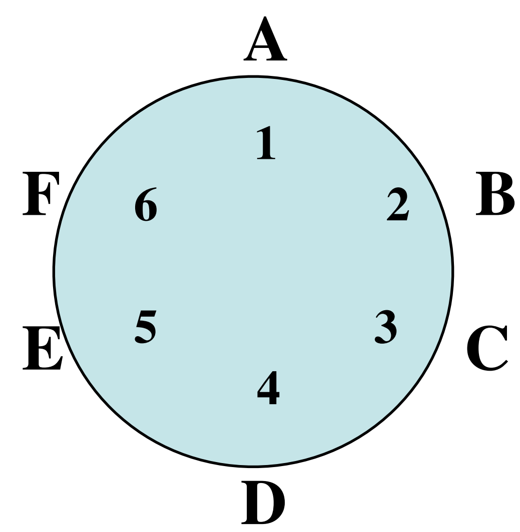

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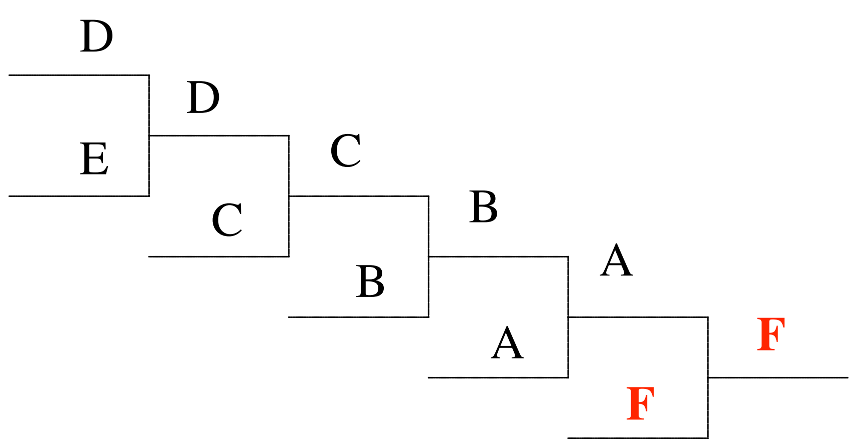

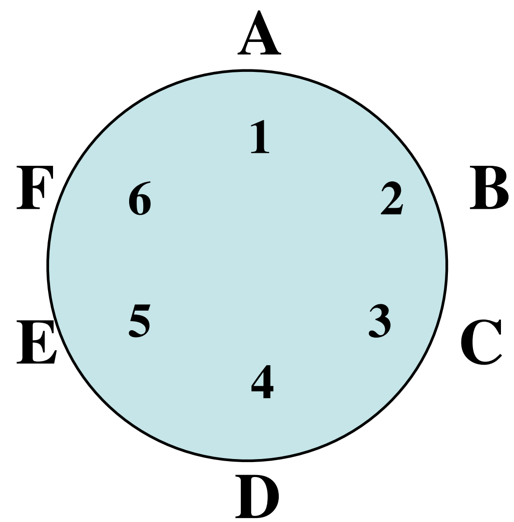

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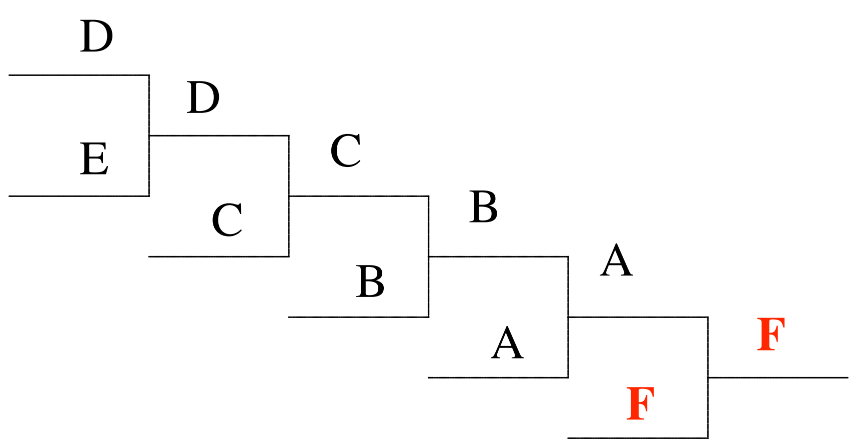
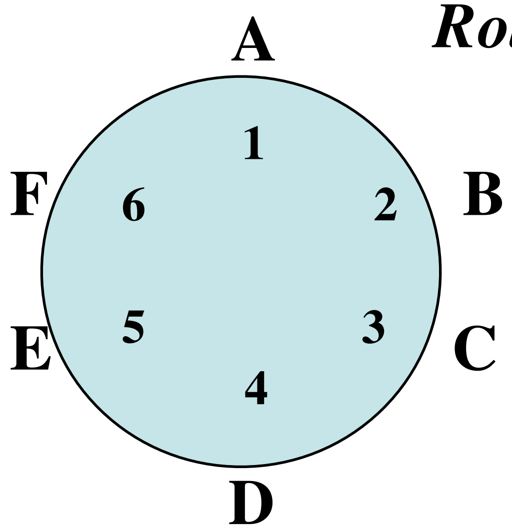


Rotate -60 degrees



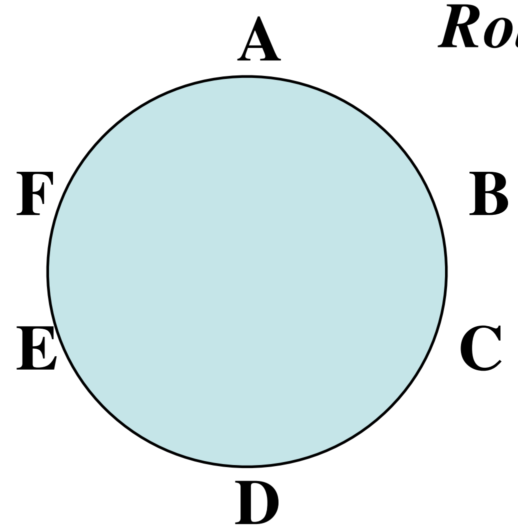
A>B>C>D>E>F

For a price .....

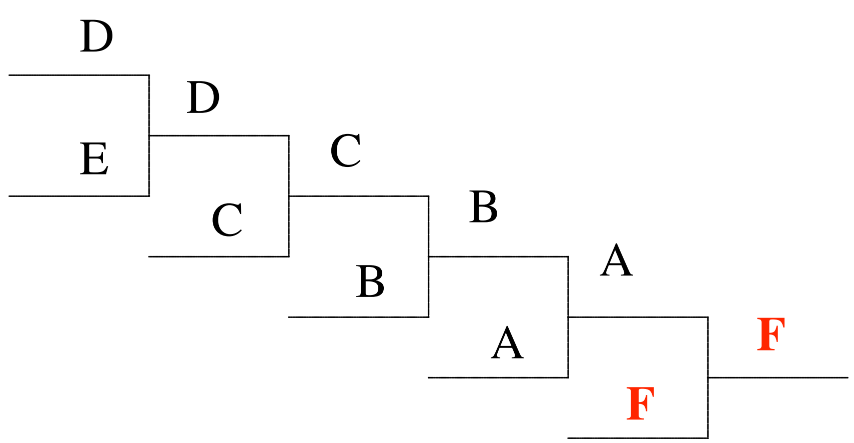
Mathematics? **Ranking Wheel**

10 A>B>C>D>E>F
10 B>C>D>E>F>A
10 C>D>E>F>A>B

Rotate -60 degrees



A>B>C>D>E>F



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Ranking Wheel

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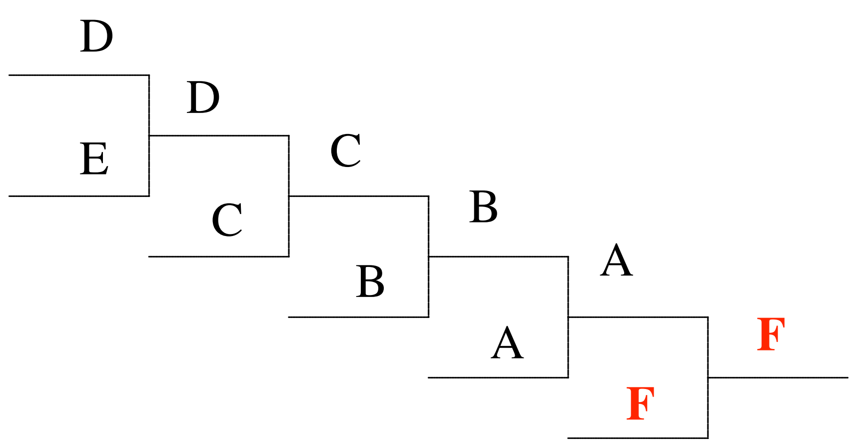

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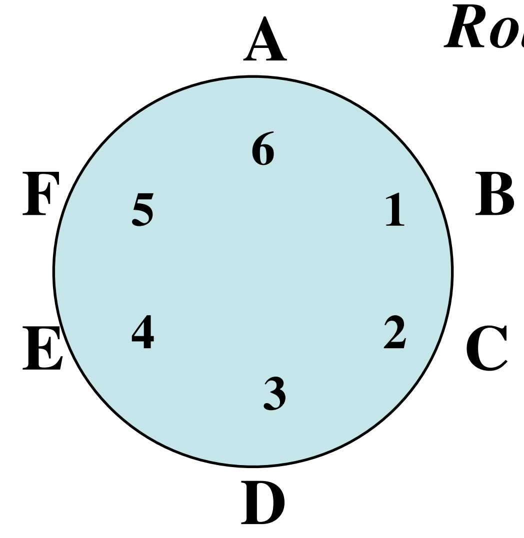

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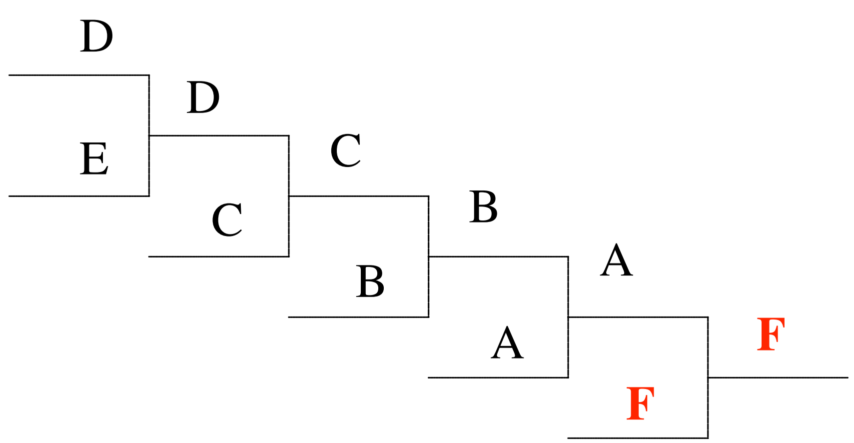

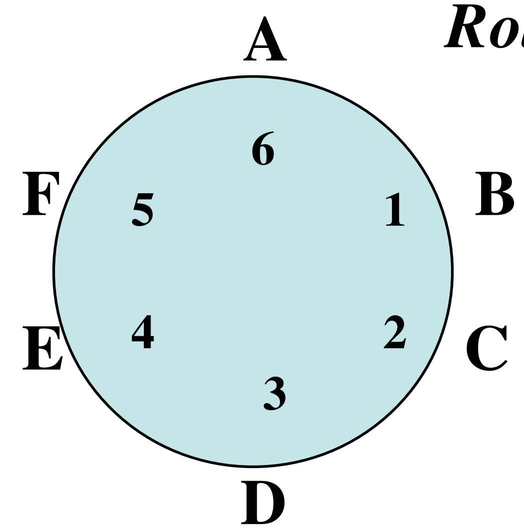

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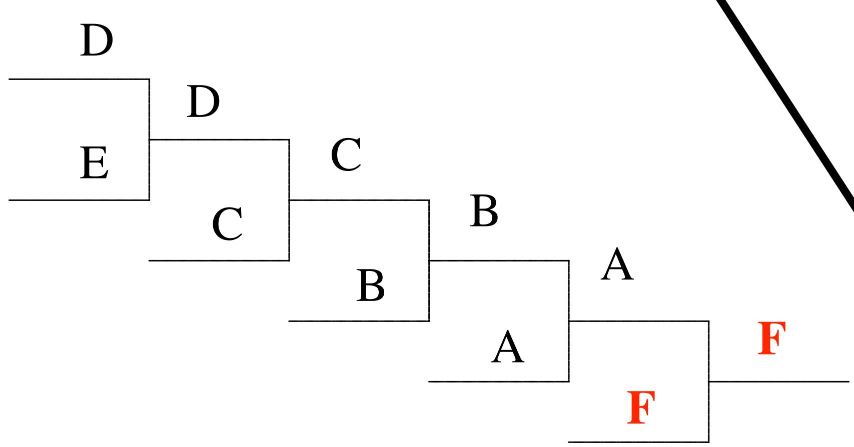

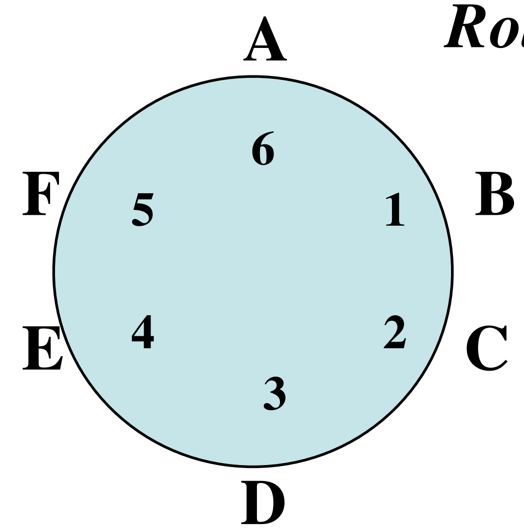

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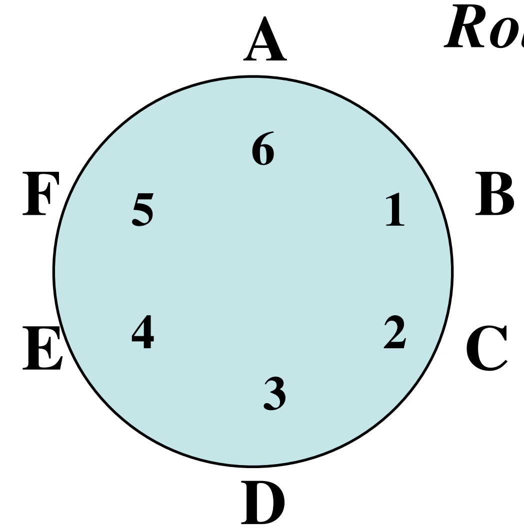

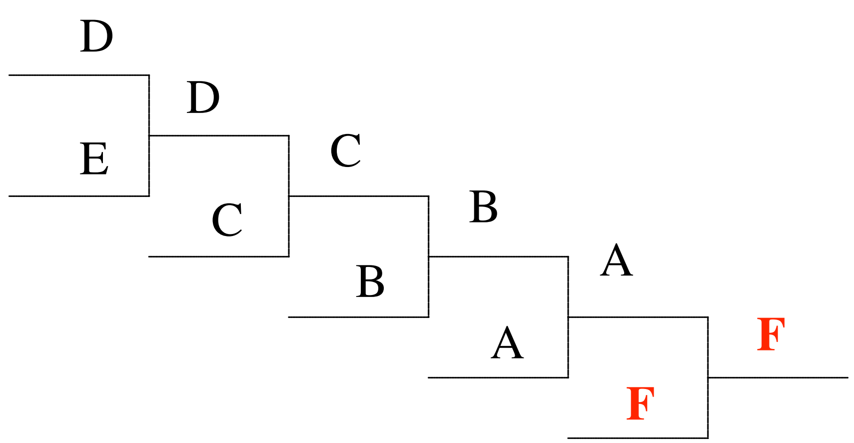

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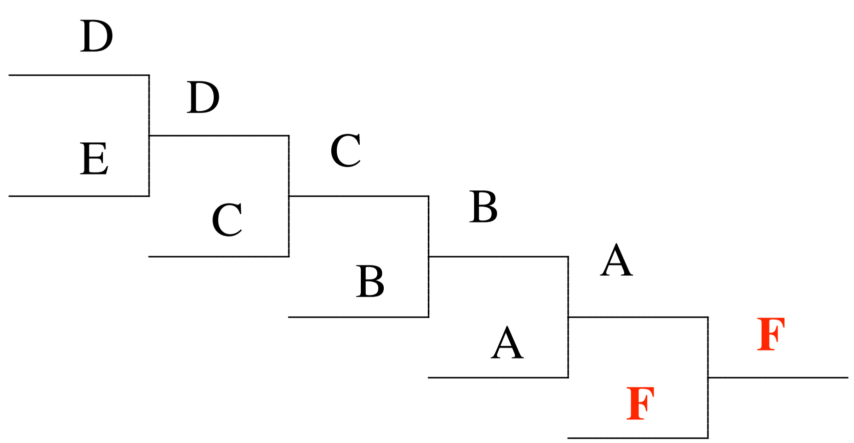

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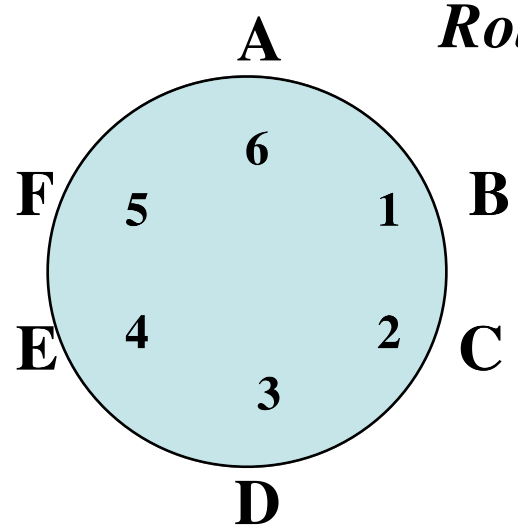

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Mathematics?

Ranking Wheel

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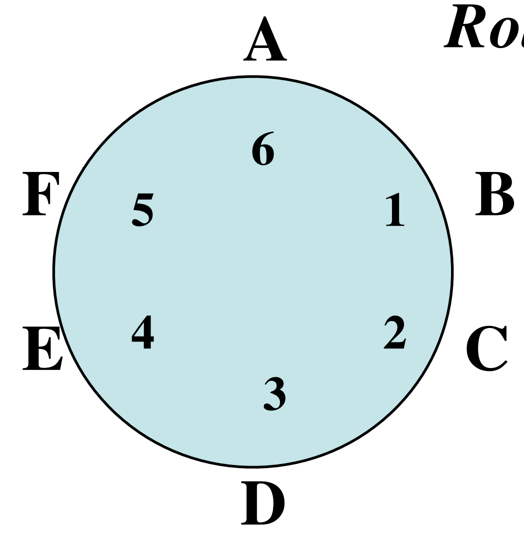

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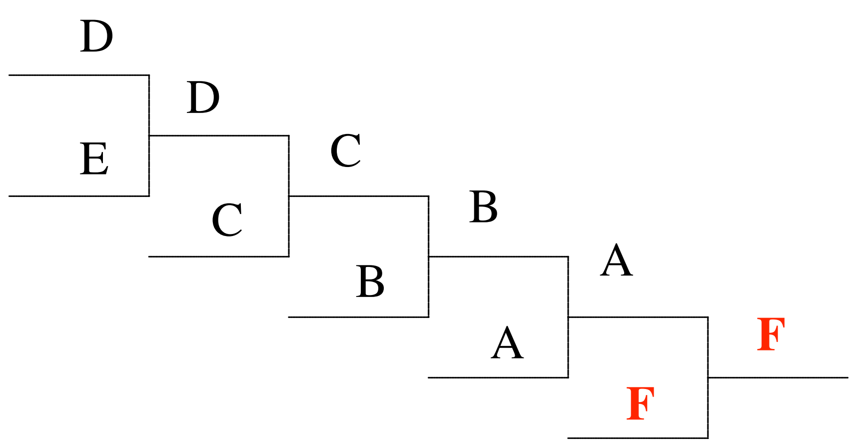

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Mathematics?

Ranking Wheel

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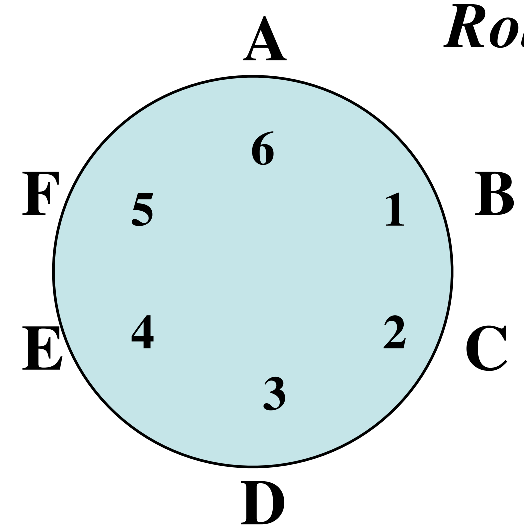

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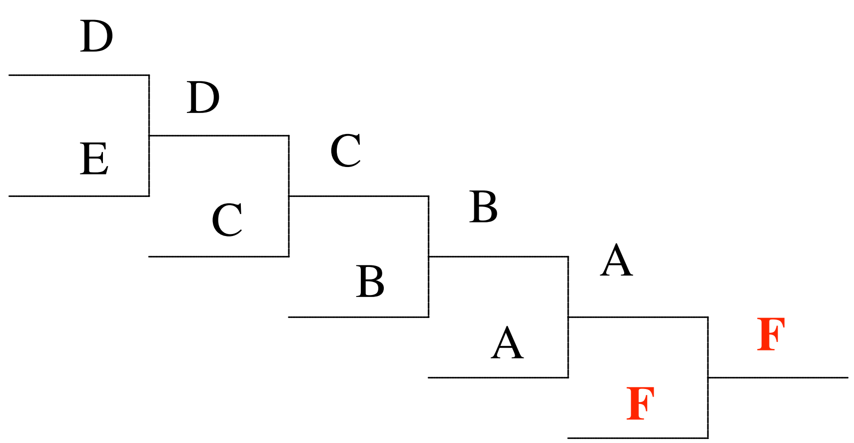

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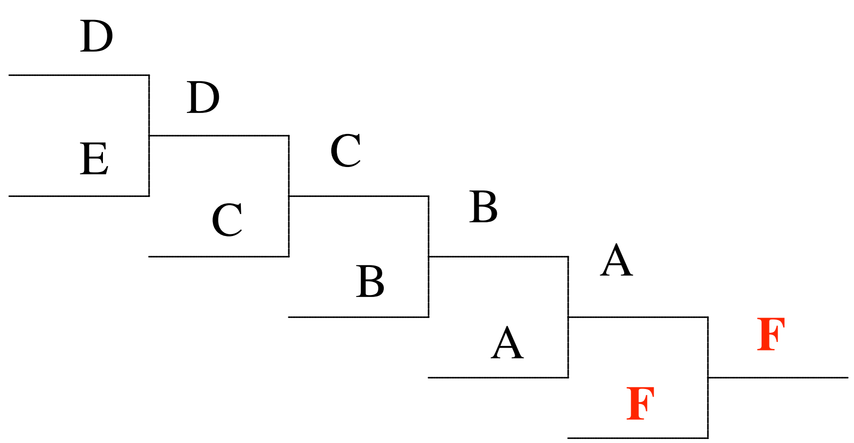

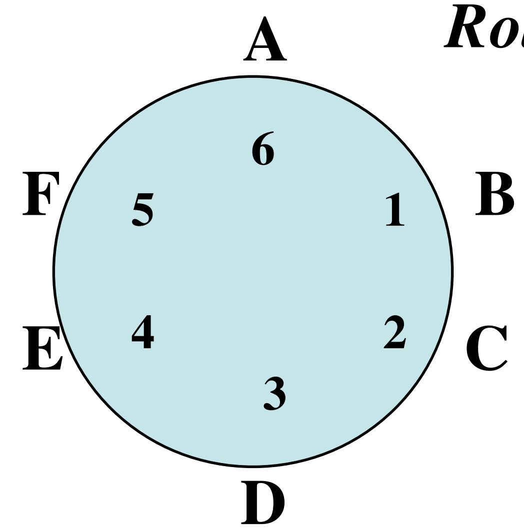

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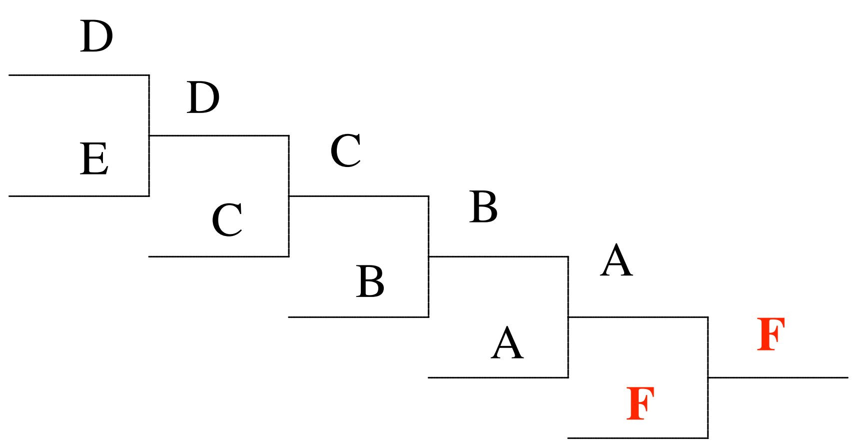

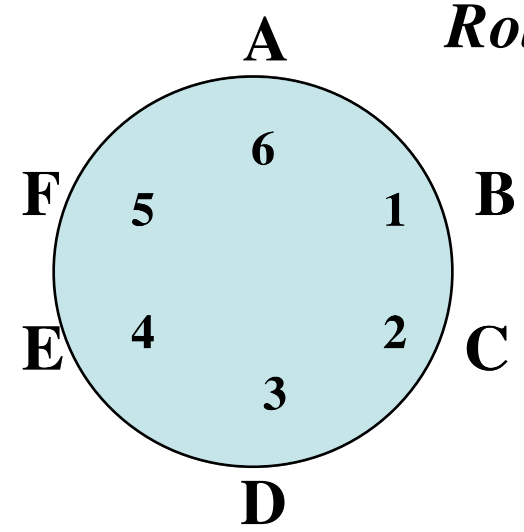

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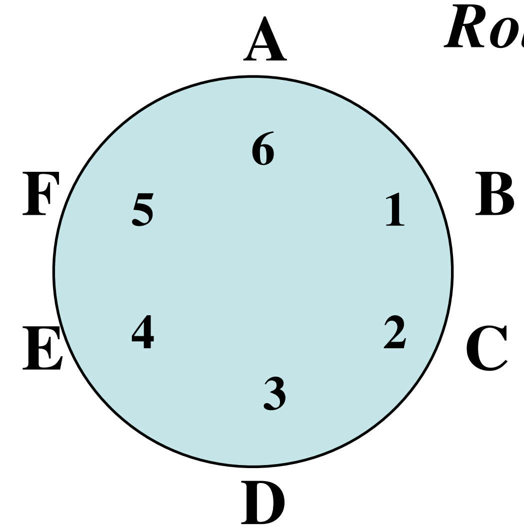

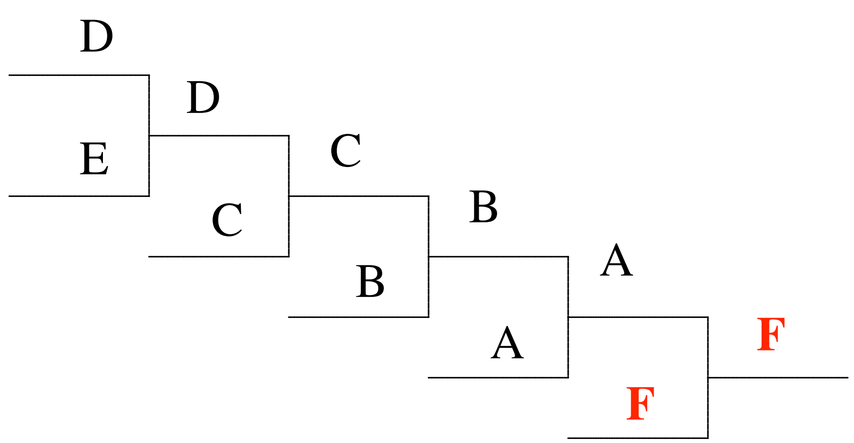

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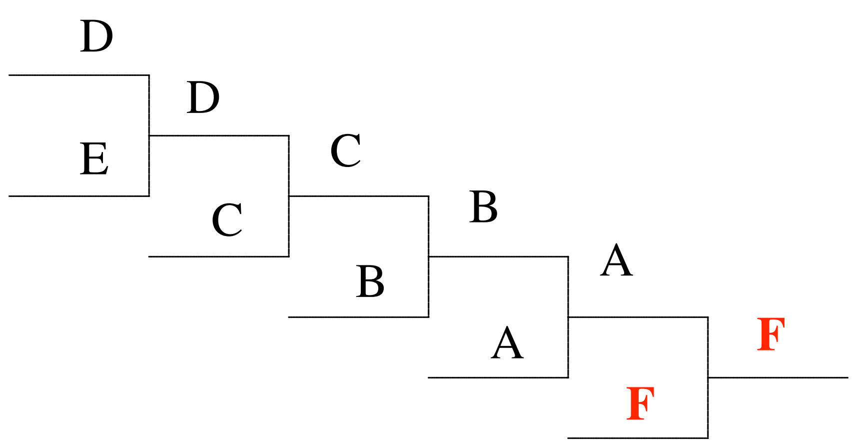

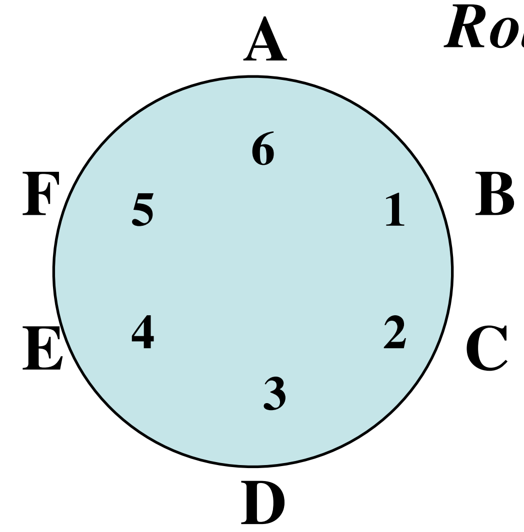

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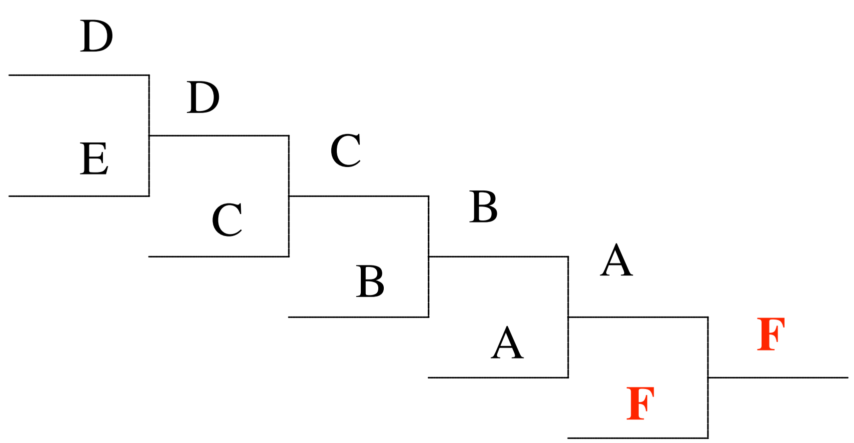

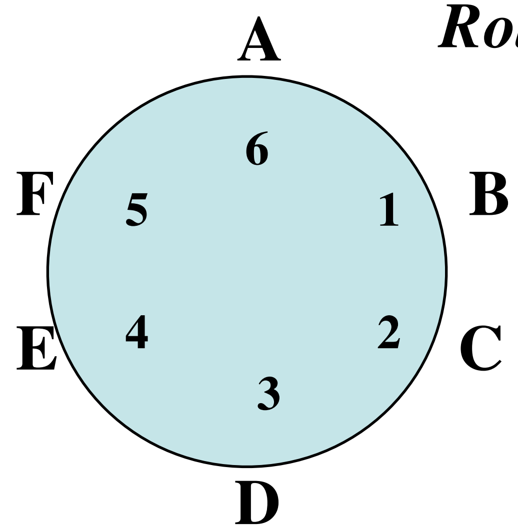

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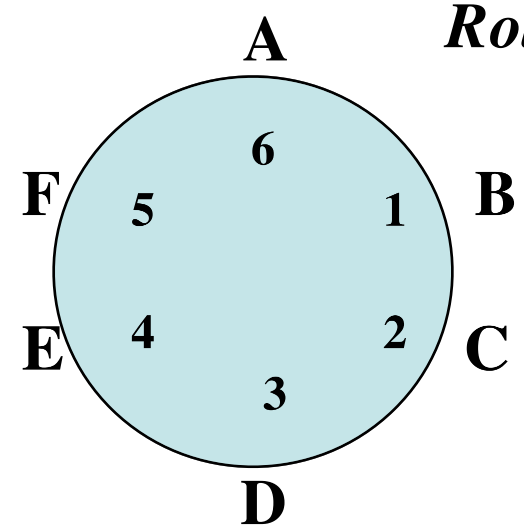
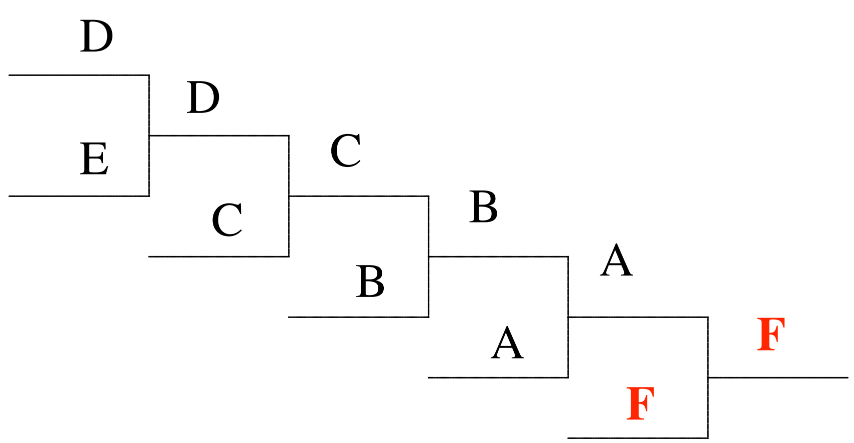


Symmetry: Z_6 orbit



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Source of all cycles; voting, statistics, engineering, etc.
For a price .....

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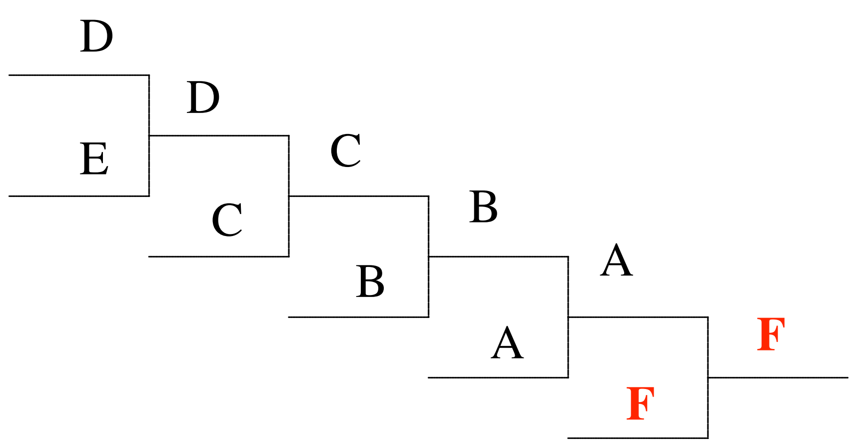

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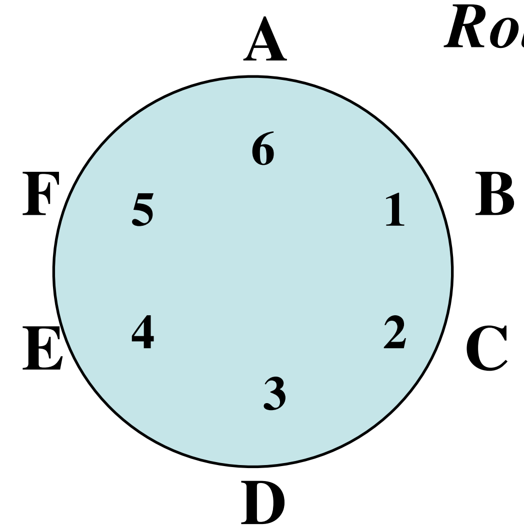

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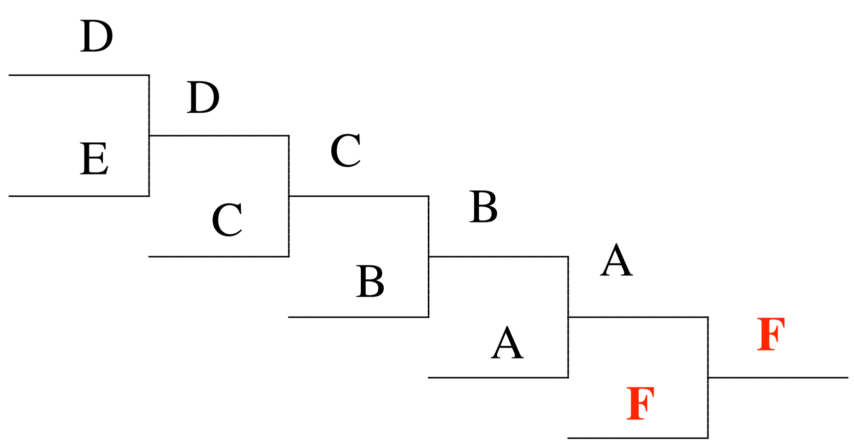

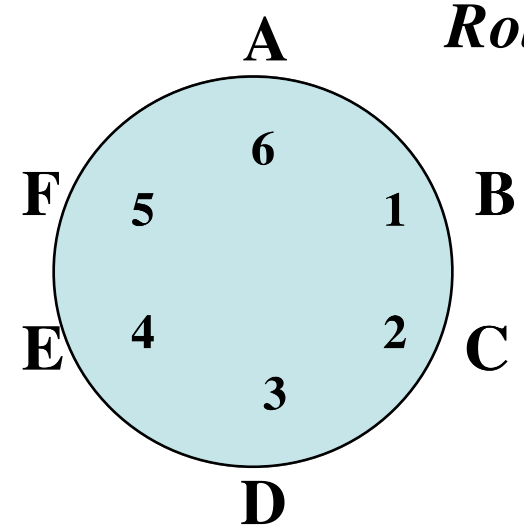

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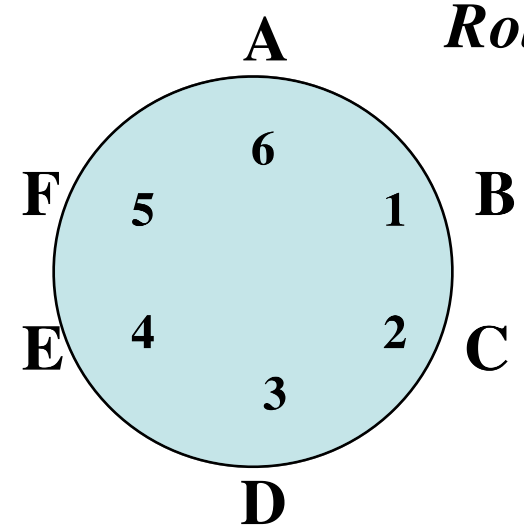

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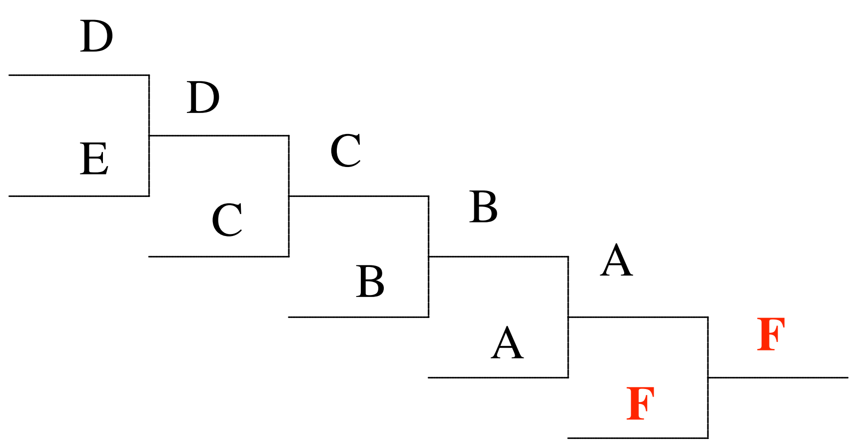

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Everywhere!

Manipulation, agenda fixing, all problems

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For a price ..... Solutions must address this!

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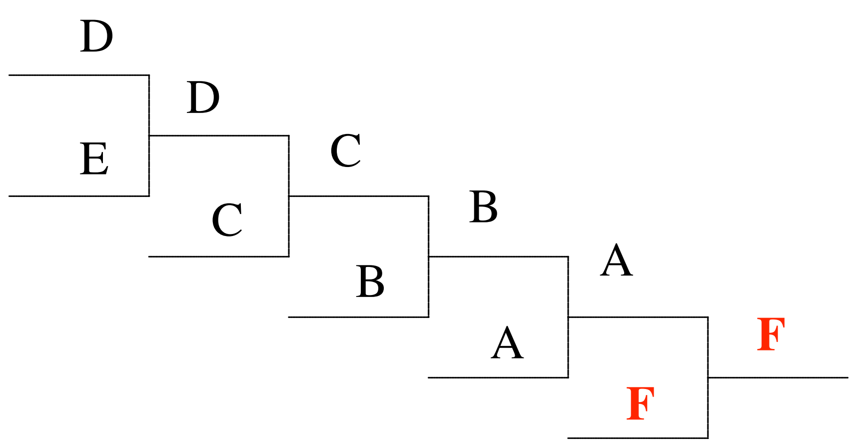

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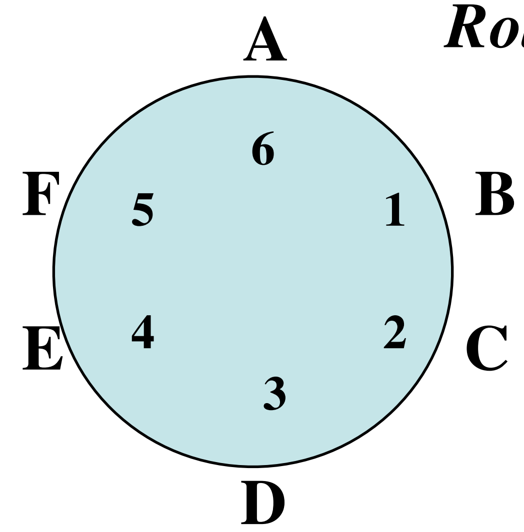

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