

MIN Suk CHANG

WITH HYEUN SIK JUNG

WITH VIVIAN HARE, JUHO KIM & MANEESH AGRAWALA

RecipeScape: mining and analyzing
diverse processes in cooking



DO YOU LIKE CHOCOLATE CHIP COOKIES?





"There's no such thing as an ideal chocolate chip cookie. At least, not one that we can all agree upon. Like pizzas and hamburgers, the ideal chocolate chip cookie varies from person to person, from mood to mood."

J. Kenji López-Alt
on Serious Eats

Recipe sharing online

YouTube KR

chocolate chip cookie

About 495,000 results

PERFECT Easy Chocolate Chip Cookies Recipe
BakeLikeAPro
2 years ago • 1,641,027 views
PERFECT Easy Chocolate Chip Cookies Recipe Easy ! Chocolate Chip Cookies Recipe !
☆>Please SUBSCRIBE: ...

Classic Chocolate Chip Cookies | Oh Yum with Anna Olson
Oh Yum with Anna Olson
6 months ago • 419,420 views
Making the classic chocolate chip cookie with Anna Olson. Subscribe for more video recipes: <http://goo.gl/MJV4af> Anna Olson ...

How to Make the Best Chocolate Chip Cookies!
kawaiisweetworld
2 years ago • 2,772,391 views
Hey everyone! This is the best chocolate chip cookie recipe for chewy on the inside, crispy on the outside cookies! These cookies ...

The BEST Oatmeal Chocolate Chip Cookies!
Living On A Dime
93 watching
Subscribe to Living On A Dime on YouTube! <http://bit.ly/1QDDmbN> Visit Our Website: <http://www.LivingOnADime.com/> Free e-Mail ...
LIVE NOW **NEW**

Baking Chocolate Chip Cookies with Shopkins Kooky Cookie from Official Magazine Recipe
CookieSwirlC
7 months ago • 2,884,299 views
Let's bake up so Shopkins Chocolate chip cookies using the recipe in the Shopkins Official Magazine #3. Make no egg cookies ...

Queen Elsa from Disney Frozen Makes Homemade Chocolate Chip Cookies - Cookieswirlc Video
CookieSwirlC

chocolate chip cookie recipes

6,526 results

All My Recipes

Desserts (5,646) Breakfast (48) Other (27) Appetizers (22) Bread (9) Main Dish (6) Drinks (3) Marinades and Sauces (1) Side Dish (1)

Chocolate Chip Cookies
31
Chocolate Chip Cookies

Chocolate Chip Cookie Dough Bars
126
Chocolate Chip Cookie Dough Bars

Chocolate Chip Cookie Dough Bites
752
Chocolate Chip Cookie Dough Bites

Oatmeal Chocolate Chip Cookie 7 Layer Bars
48
Oatmeal Chocolate Chip Cookie 7 Layer Bars

Peanut Butter Chocolate Chip Cookie Dough Dip
174
Peanut Butter Chocolate Chip Cookie Dough Dip

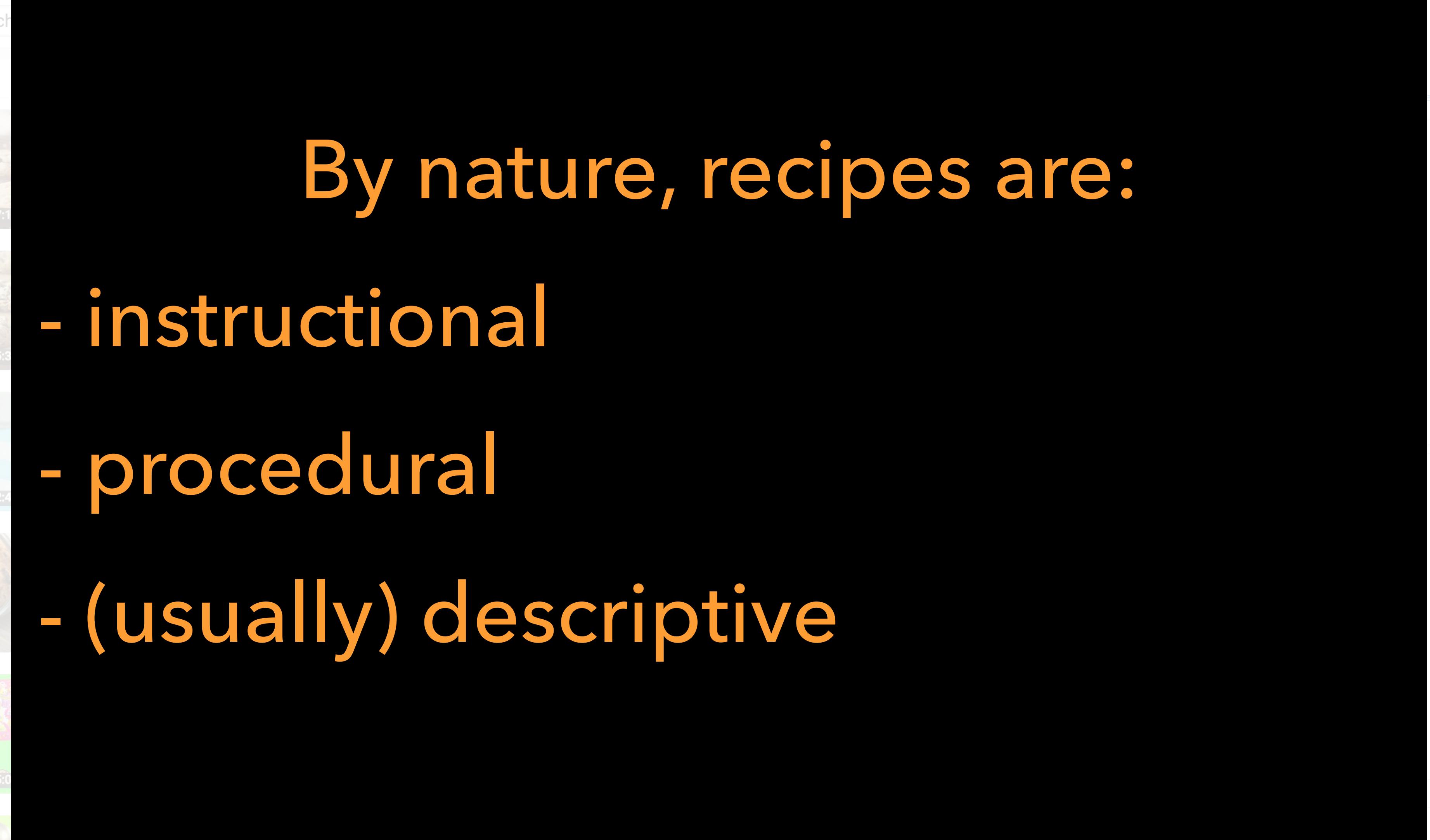
Chocolate Chip Cookie Dough Blondies
96
Chocolate Chip Cookie Dough Blondies

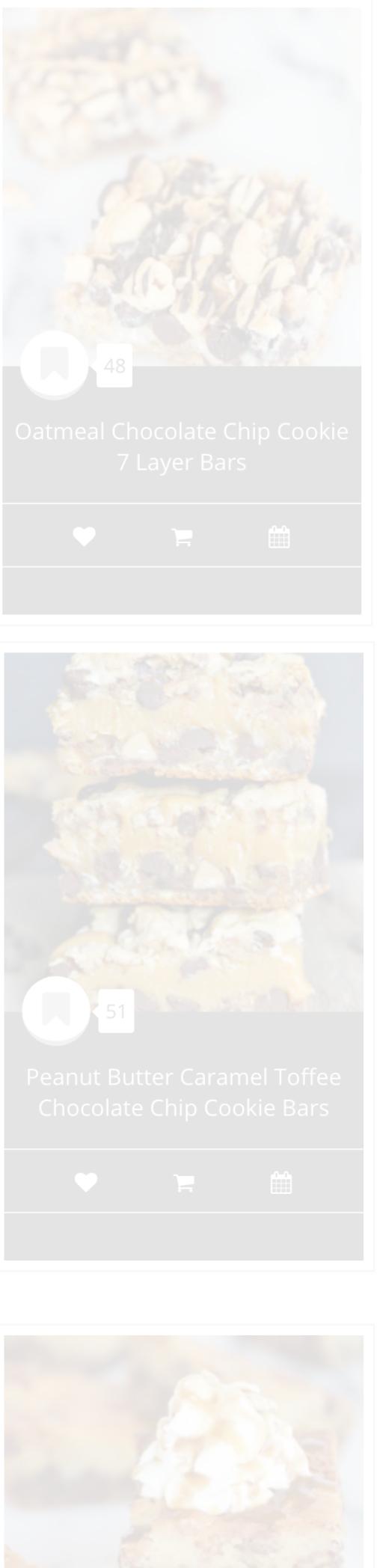
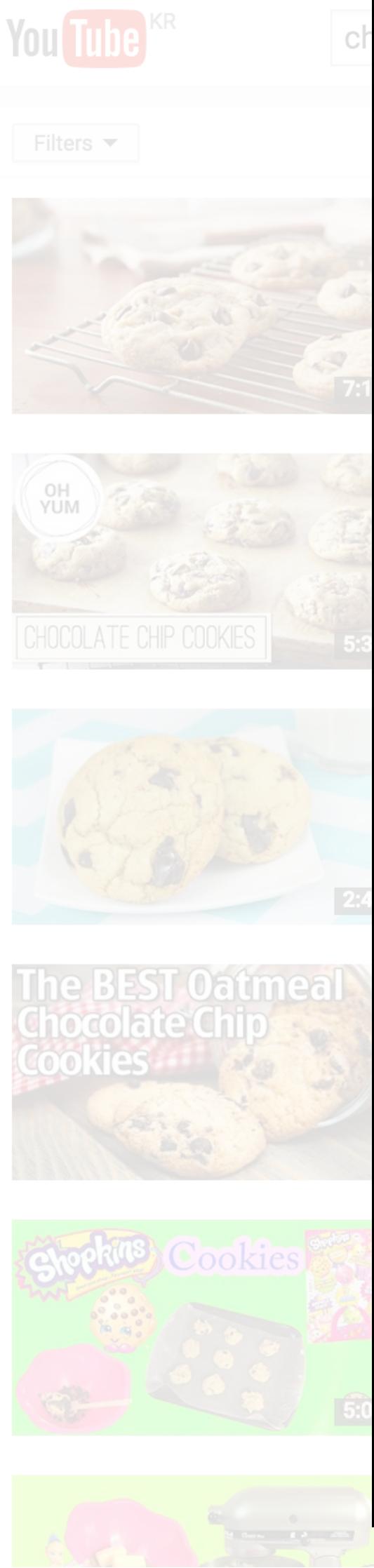
Chocolate Chip Cookie Dough Brownies ("brookies")
96
Chocolate Chip Cookie Dough Brownies ("brookies")

Peanut Butter Caramel Toffee Chocolate Chip Cookie Bars
51
Peanut Butter Caramel Toffee Chocolate Chip Cookie Bars

Recipe sharing online

chocolate chip cookie recipes

- 
- By nature, recipes are:
- instructional
 - procedural
 - (usually) descriptive



Recipe sharing online

chocolate chip cookie

About 495,000 results

PERFECT Easy Chocolate Chip Cookies Recipe

chocolate chip cookie recipes

6,526 results

All My Recipes

Desserts (5,646) Breakfast (48) Other (27) Appetizers (22) Bread (9) Main Dish (6) Drinks (3) Marinades and Sauces (1) Side Dish (1)

OH YUM CHOCOLATE CHIP COOKIES

The BEST Oatmeal Chocolate Chip Cookies

Shopkins Cookies Official Magazine Recipe

CookieSwirlC

7 months ago • 2,884,299 views

Let's bake up so Shopkins Chocolate chip cookies using the recipe in the Shopkins Official Magazine #3. Make no egg cookies ...

5:09

Queen Elsa from Disney Frozen Makes Homemade Chocolate Chip Cookies - Cookieswirlc Video

CookieSwirlC

Oatmeal Chocolate Chip Cookie 7 Layer Bars

Peanut Butter Chocolate Chip Cookie Dough Dip

Chocolate Chip Cookie Dough Blondies

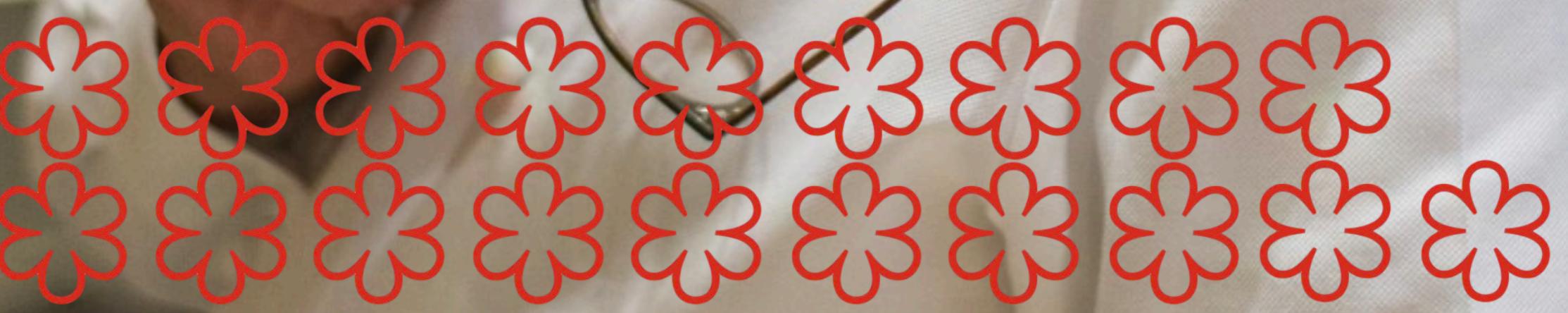
Chocolate Chip Cookie Dough Brownies ("brookies")

Peanut Butter Caramel Toffee Chocolate Chip Cookie Bars

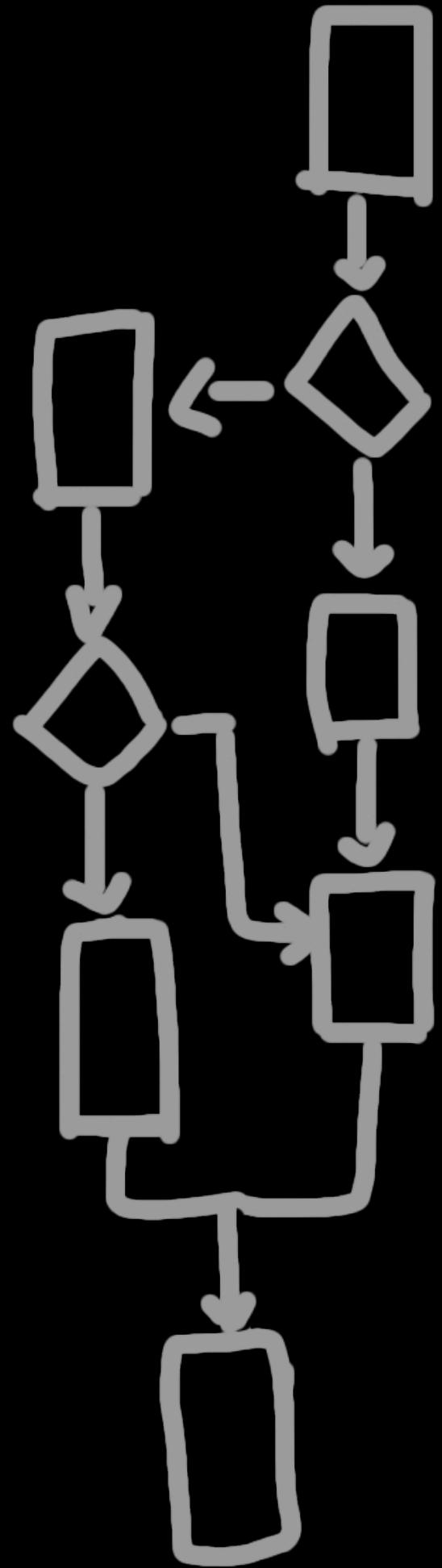
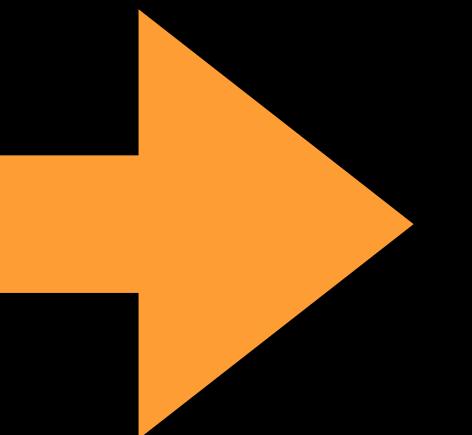
naturally crowdsourced
instructions toward a shared
goal !!

"Proportion of ingredients is important, but the final result is also a matter of how you put them together."

Alain Ducasse



a matter of how you
put them together



PROCESS!

RECIPE = PROCESS

Obs 1. Cooking is a very important activity in our lives

Obs 2. We have hundreds of ~~recipes~~ naturally crowdsourced processes
for a single dish

RECIPE = PROCESS

Obs 1. Cooking is a very
complex process.

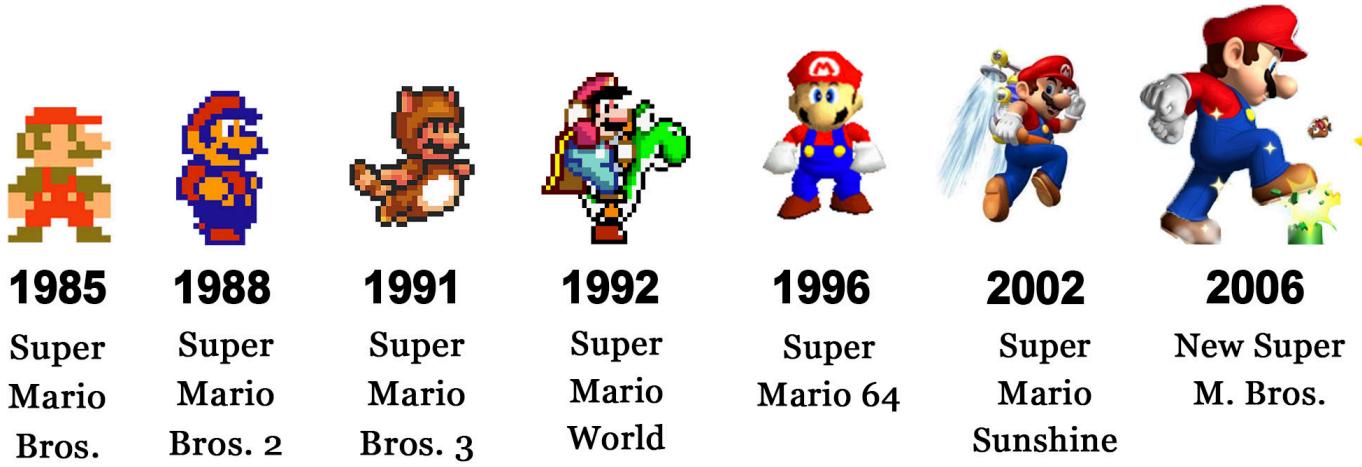
Obs 2. We have huge
amounts of knowledge
for a single dish

**Can we
understand the
collective knowledge
and practices around
cooking? How?**

Cultural analytics

“Longitudinal”

how individual entities
evolve, influence with
time



“Cross-sectional”

what's the current
state of the world



Cultural analytics

“Cross-sectional”

what's the current
state of the world



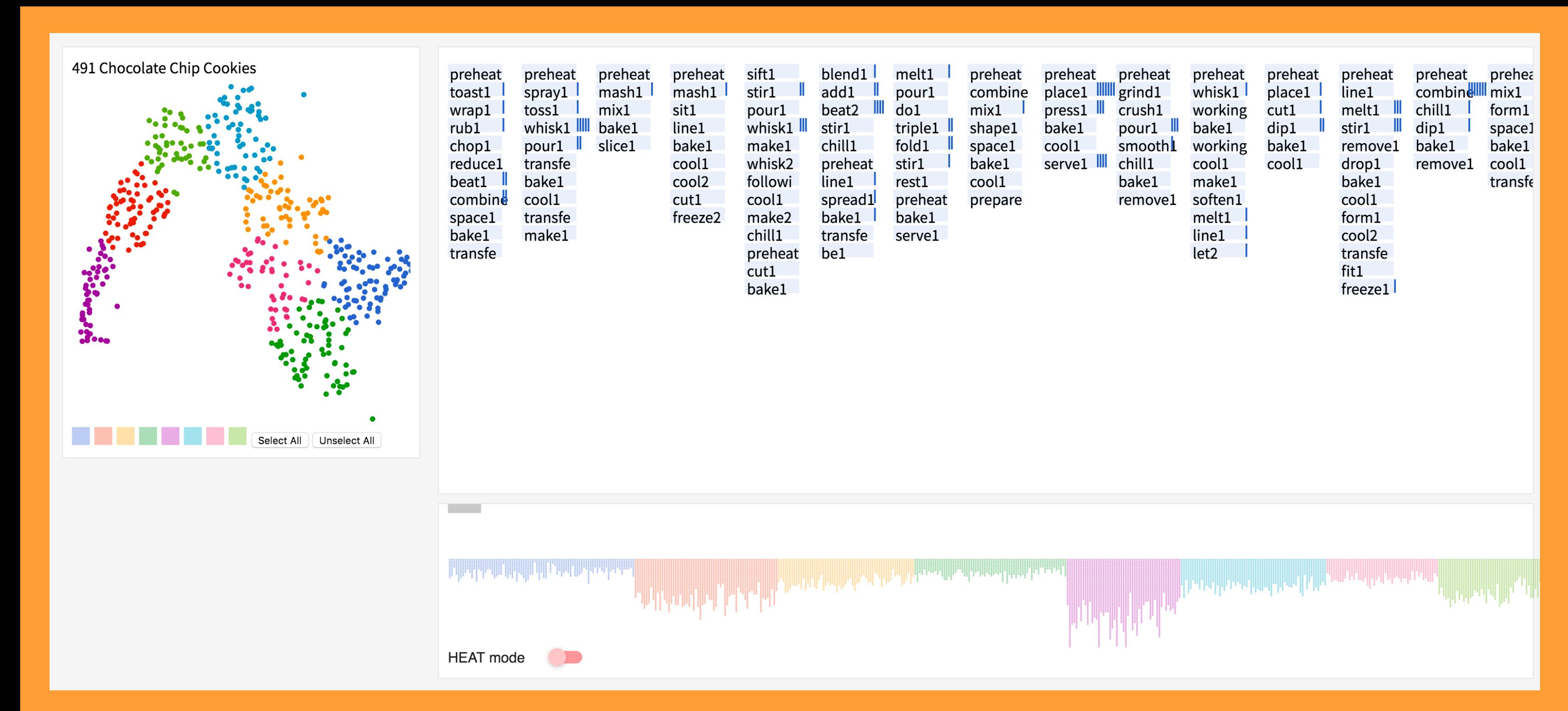
What can we learn from analyzing the embedded processes in hundreds of recipes for a single dish?

- 🍪 What makes a cookie a cookie?
- 🍪 Average recipe? Creative variants or outliers?
- 🍪 Simplest vs most complex recipe?
- 🍪 What are some common skills?
- 🍪 Can we discover ordering constraints?
- 🍪 Can we cluster fundamentally different ways of making a cookie?

RecipeScape: Recipe Analytics Interface

2 Main visualizations

- RecipeMap
- RecipeDeck



RecipeScape: Recipe Analytics Interface

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- RecipeMap

- RecipeDeck



RecipeMap

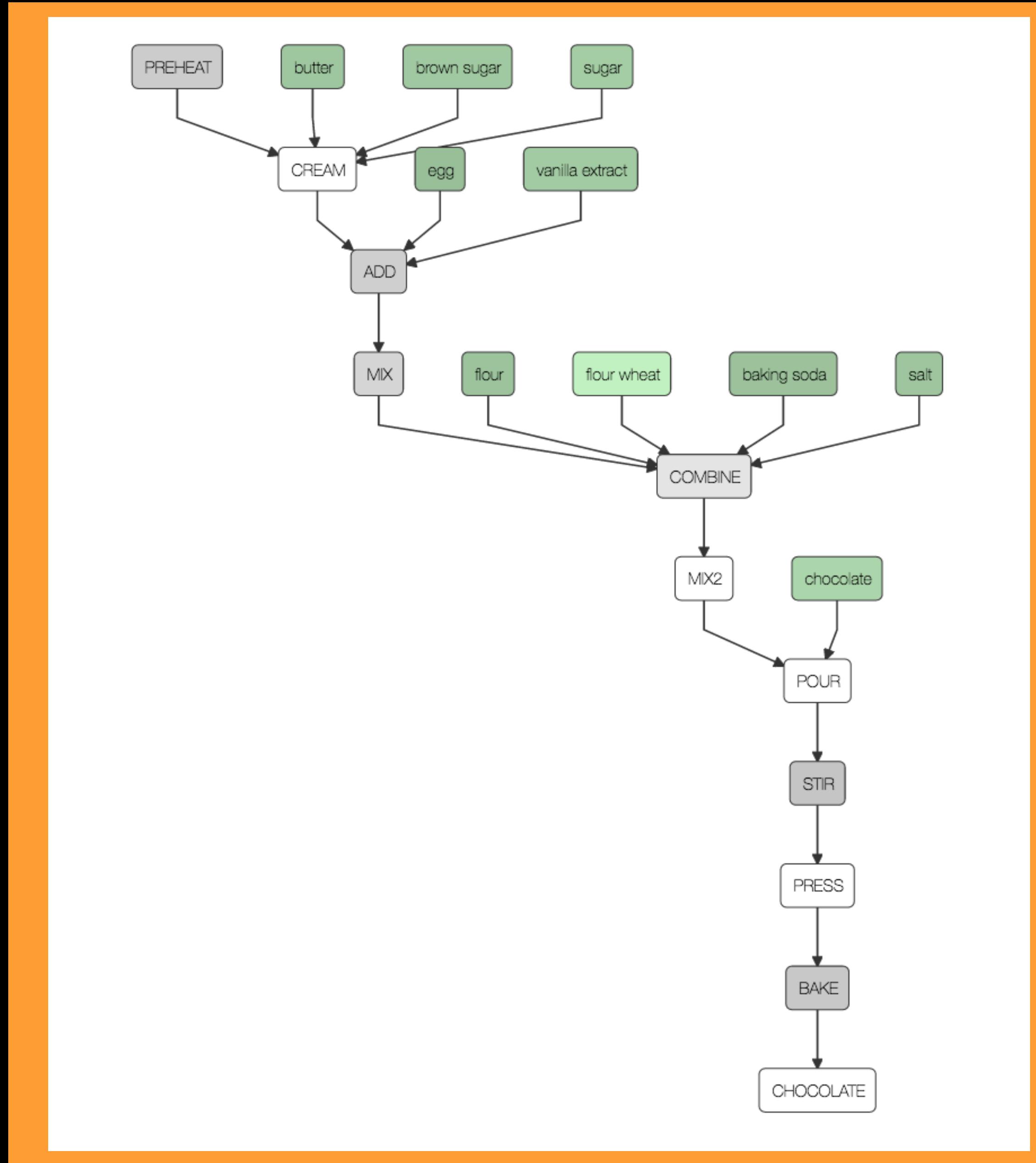
491 Chocolate Chip Cookies



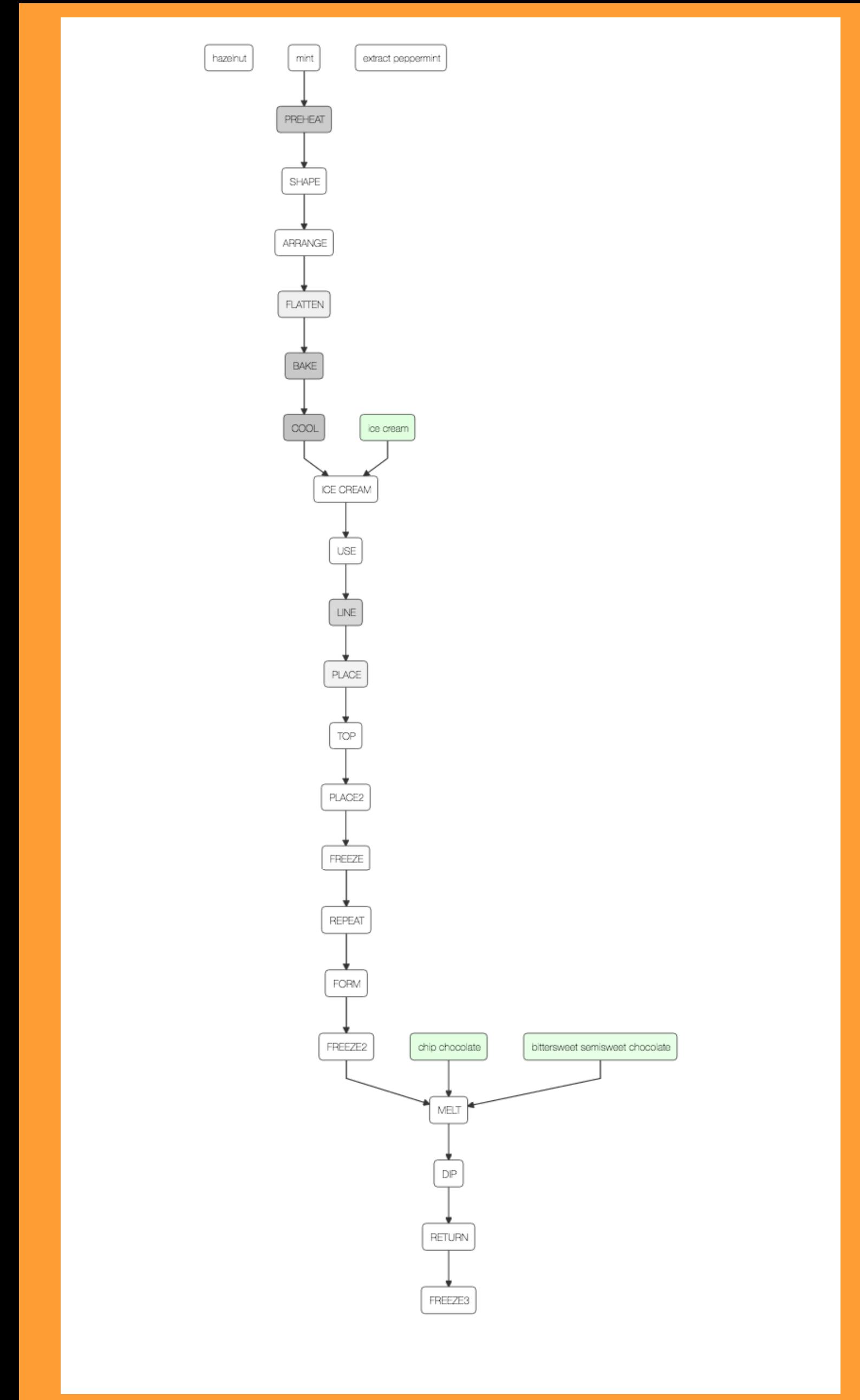
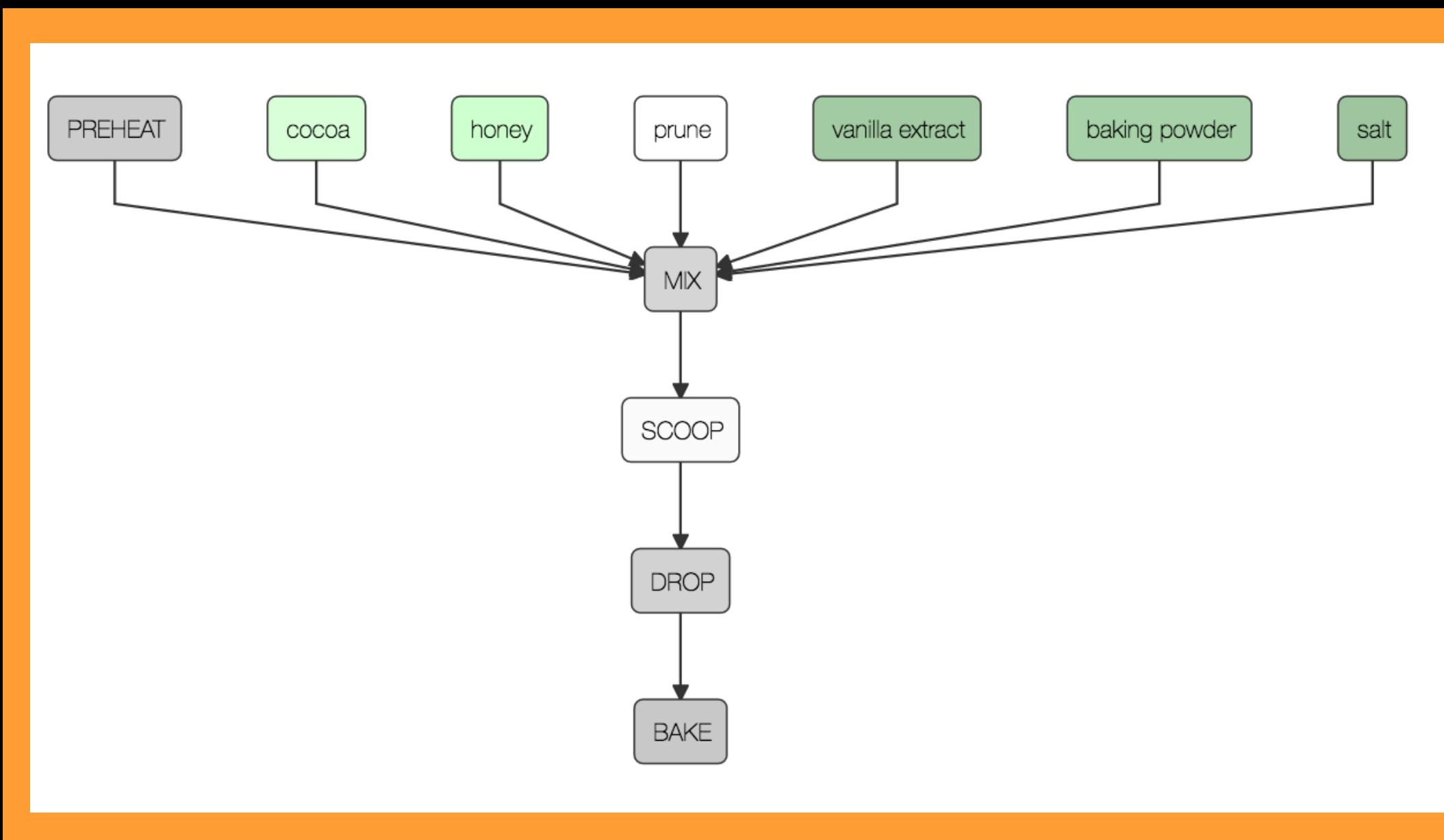
Select All

Unselect All

The Median Chocolate Chip Cookie Recipe



Far Away from the Median Recipe



RecipeScape: Recipe Analytics Interface

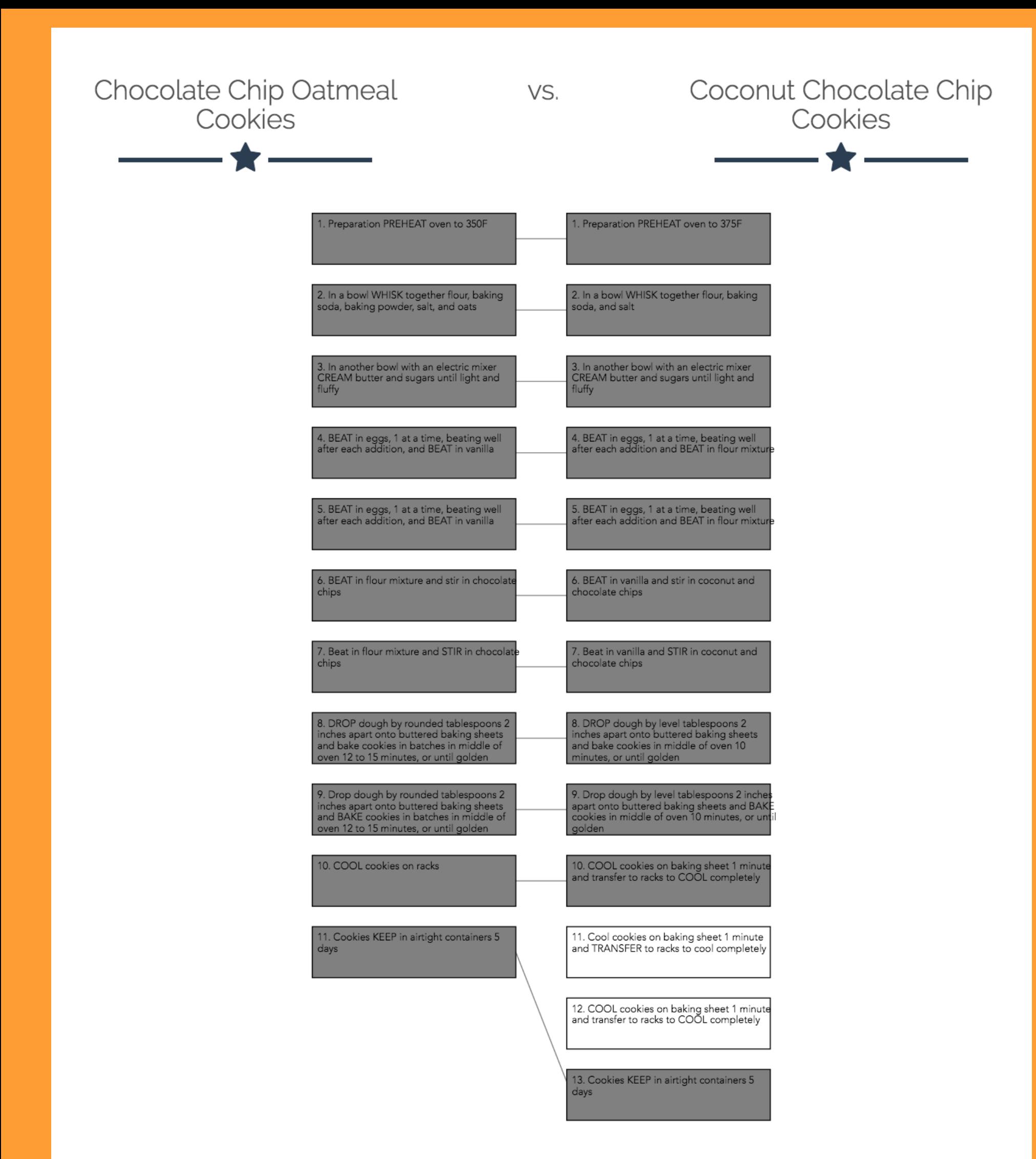
2 Main visualizations

- RecipeMap
- RecipeDeck

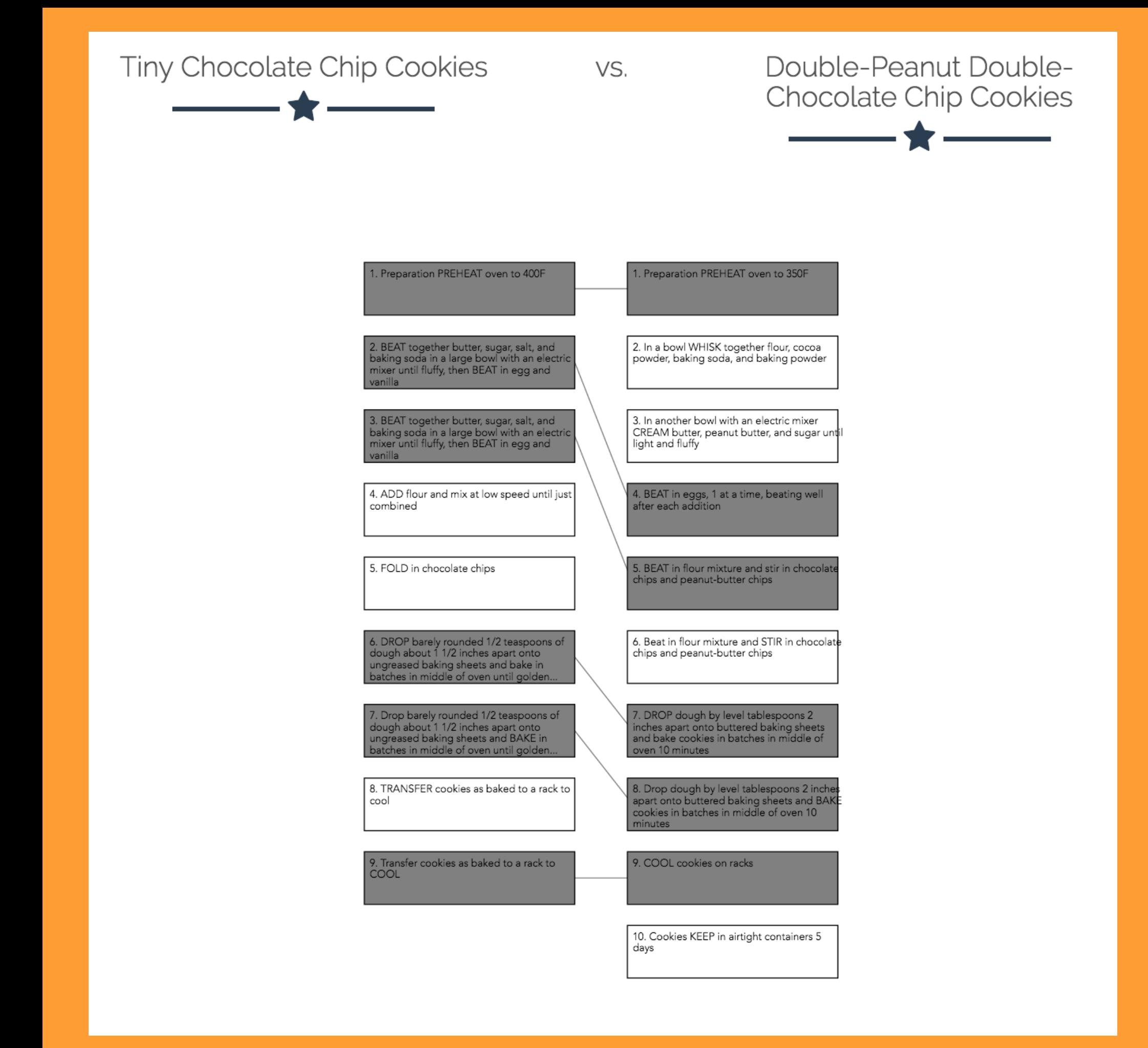


pairwise comparison view - union graph

High similarity



Medium similarity



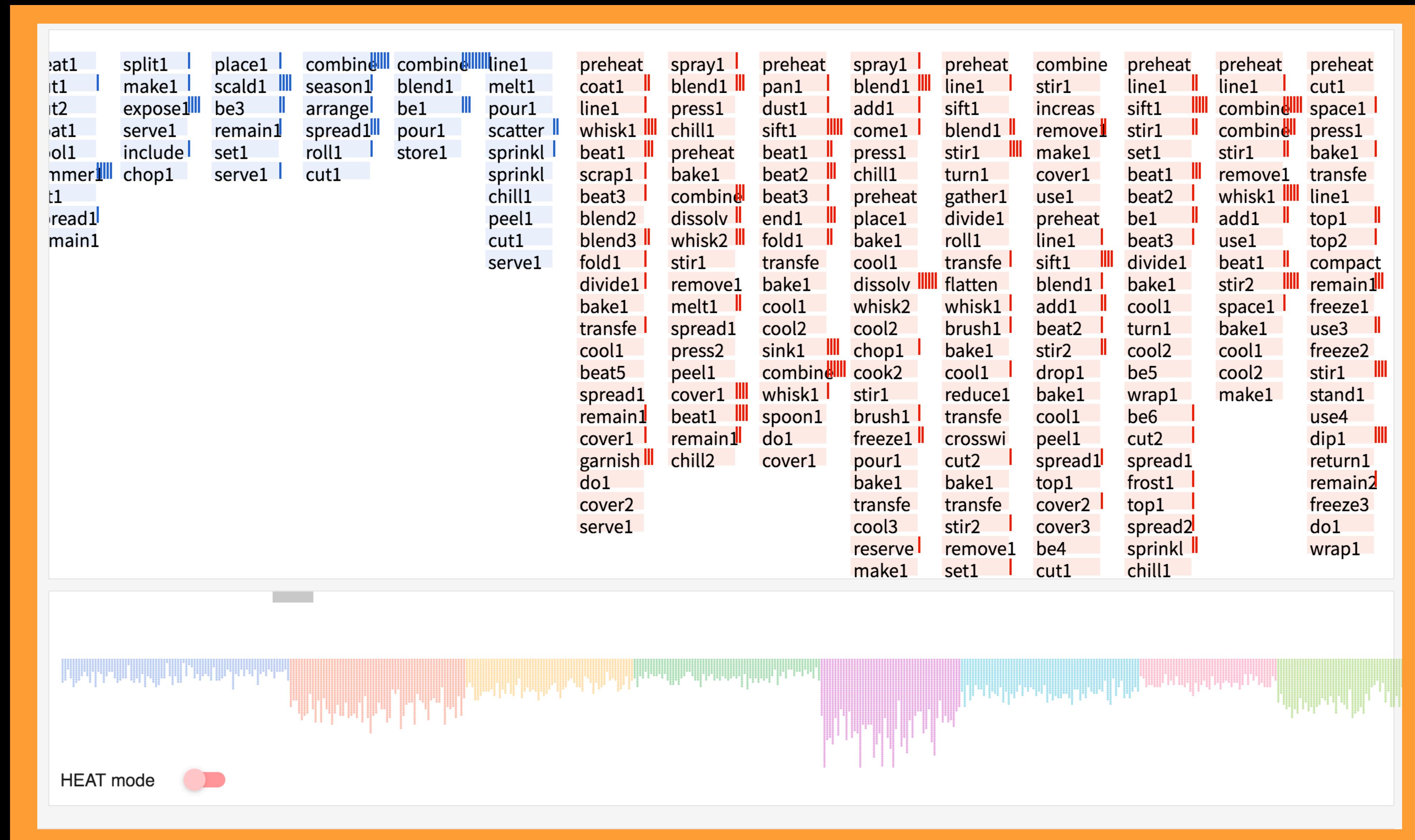
RecipeScape: Recipe Analytics Interface

2 Main visualizations

- RecipeMap
- RecipeDeck

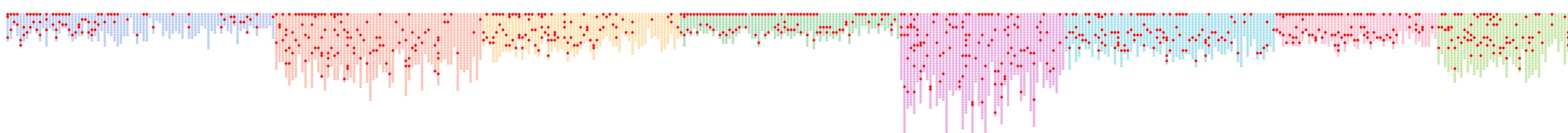


RecipeDeck: looking at all the recipes at once



RecipeDeck: heat mode

eat1	split1	place1	combine1	combine1	line1	preheat	spray1	preheat	spray1	preheat	combine	preheat	preheat	preheat
it1	make1	scald1	season1	blend1	melt1	coat1	blend1	pan1	blend1	line1	stir1	line1	line1	cut1
t2	expose1	be3	arrange1	be1	pour1	line1	press1	dust1	add1	sift1	increas	sift1	combine	space1
at1	serve1	remain1	spread1	pour1	scatter	whisk1	chill1	sift1	come1	blend1	remov	stir1	combine	press1
ol1	include1	set1	roll1	store1	sprinkl	beat1	preheat	beat1	press1	stir1	make1	set1	stir1	bake1
nmer1	chop1	serve1	cut1		sprinkl	scrap1	bake1	beat2	chill1	turn1	cover1	beat1	remove1	transfe
t1					chill1	beat3	combine	beat3	preheat	gather1	use1	beat2	whisk1	line1
read1					beat3	peel1	dissolv	end1	place1	divide1	preheat	be1	add1	top1
main1					blend2	blend2	cut1	fold1	bake1	roll1	line1	beat3	use1	top2
					cut1	blend3	blend3	fold1	cool1	transfe	sift1	divide1	beat1	compact
					serve1	fold1	stir1	transfe	cool1	transfe	blend1	bake1	stir2	remain1
						divide1	remove1	bake1	dissolv	flatten	bake1	bake1	space1	freeze1
						bake1	melt1	cool1	whisk2	whisk1	add1	cool1	use3	
							transfe	spread1	cool2	cool2	brush1	beat2	turn1	bake1
							cool1	press2	sink1	chop1	bake1	stir2	cool2	freeze2
							beat5	peel1	combine	cook2	cool1	drop1	be5	cool2
							spread1	cover1	whisk1	stir1	reduce1	bake1	wrap1	stir1
							remain1	beat1	spoon1	brush1	transfe	cool1	be6	
							cover1	remain1	do1	freeze1	crosswi	peel1	cut2	
							garnish	chill2	cover1	pour1	cut2	spread1	spread1	dip1
							do1		bake1	bake1	top1	frost1	return1	
							cover2		transfe	transfe	cover2	top1	remain2	
							serve1		cool3	stir2	cover3	spread2	freeze3	
									reserve	remove1	be4	sprinkl	do1	
									make1	set1	cut1	chill1	wrap1	



HEAT mode

RecipeDeck: select individual action

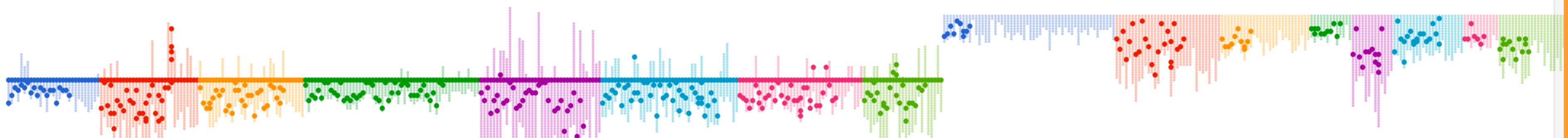
preheat	preheat	preheat	preheat	sift1	blend1	melt1	preheat									
toast1	spray1	mash1	mash1	stir1	add1	pour1	combine	place1	grind1	whisk1	place1	line1	combine	mix1		
wrap1	toss1	mix1	sit1	pour1	beat2	do1	mix1	press1	crush1	working	cut1	melt1	chill1	form1		
rub1	whisk1	bake1	line1	whisk1	stir1	triple1	shape1	bake1	pour1	bake1	dip1	stir1	dip1	space1		
chop1	pour1	slice1	bake1	make1	chill1	fold1	space1	cool1	smooth1	working	bake1	remove1	bake1	bake1		
reduce1	transfe		cool1	whisk2	preheat	stir1	bake1	serve1	chill1	cool1	make1	drop1	remove1	cool1	transfe	
beat1	bake1	Transfer to prepared baking sheet.	line1	rest1	cool1	preheat	prepare	remove1	bake1	soften1	bake1	cool1	cool1	cool1	transfe	
combine	cool1		cut1	spread1	bake1	bake1			bake1	melt1	line1	line1	cool1	form1		
space1	transfe		freeze2	make2	chill1	transfe	bake1			let2	cool2	transfe	fit1	freeze1		
bake1	make1			preheat		be1										
transfe				cut1												

HEAT mode

preheat1

RecipeDeck: select more than one action

preheat	preheat	hold1	preheat	sift1	preheat	preheat	preheat	preheat	preheat	preheat	preheat	beat1						
combine	knock1	cut1	stir1	line1	sift1	melt1	sift1	blend1	drop1	butter1	set1	cool1	combine	use1	bake1	transfe	beat1	
set1	whisk1	cut2	sift1	melt1	sift1	beat1	blend1	beat1	press1	beat2	beat1	beat1	stir1	chop1	increas	beat1		
granula	melt1	peel1	beat1	blend1	rise1	beat2	beat1	beat1	blend1	beat2	beat2	beat1	remove1	bake1	stir1	beat1		
blend1	cool1	make1	beat2	blend1	stir1	beat3	beat1	marshma	bake1	sift1	squeeze1	beat1	transfe	divide1	whisk1	stir1	beat1	
add2	be1	transfe	blend1	stir1	do1	fold1	drop1	cool1	bake1	roll1	whisk1	cool1	roll1	pour1	be1	beat1		
beat1	combine	combine	spread1	fold1	drop1	bake1	be1	dissolv	chill1	beat4	whisk3	cut2	spread1	keep1				
place1	spread1	preheat	sprinkl	fold1	drop1	bake1	be1	chill1	beat1	whisk1	preheat	transfe	bake3	soft1				
arrange	cool2	divide1	remain1	mix1	flatten	transfe	simmer1	whisk1	preheat	stir1	whisk4	transfe	bake4	pre1				
press1	turn1	pour1	bake1	freeze1	bake1	transfe	reduce1	read1	line1	place1	pour1	gather1	bake1	line1				
continu	remove1	bake1	cool1	drop1	reverse	simmer1	be2	remove1	remove1	roll1	bake1	remain1	cool1	roll1				
brown1	stir3	chill1	bake1	bake1	bake1	stir1	remove1	pour1	lay1	space1	cool2	re1						
lift1	cool3	serve1	transfe	cool1	dip1	spoon1	remain1	remain1	bake1	bake1	cut1	transfe						
let1	spoon1			freeze1	spoon1	remain1	prepare	cool1	cool1	cool2	be1							
wax1	squeeze			spoon1	top1	chill1	cover1	chill1	chill1	can1	transfe							
melt1	squeeze			wrap1	make1	make1	serve1											
melt2	chill1			remain1	cover1													
coat1	bring2			do1	serve1													
press2																		
1																		
.																		

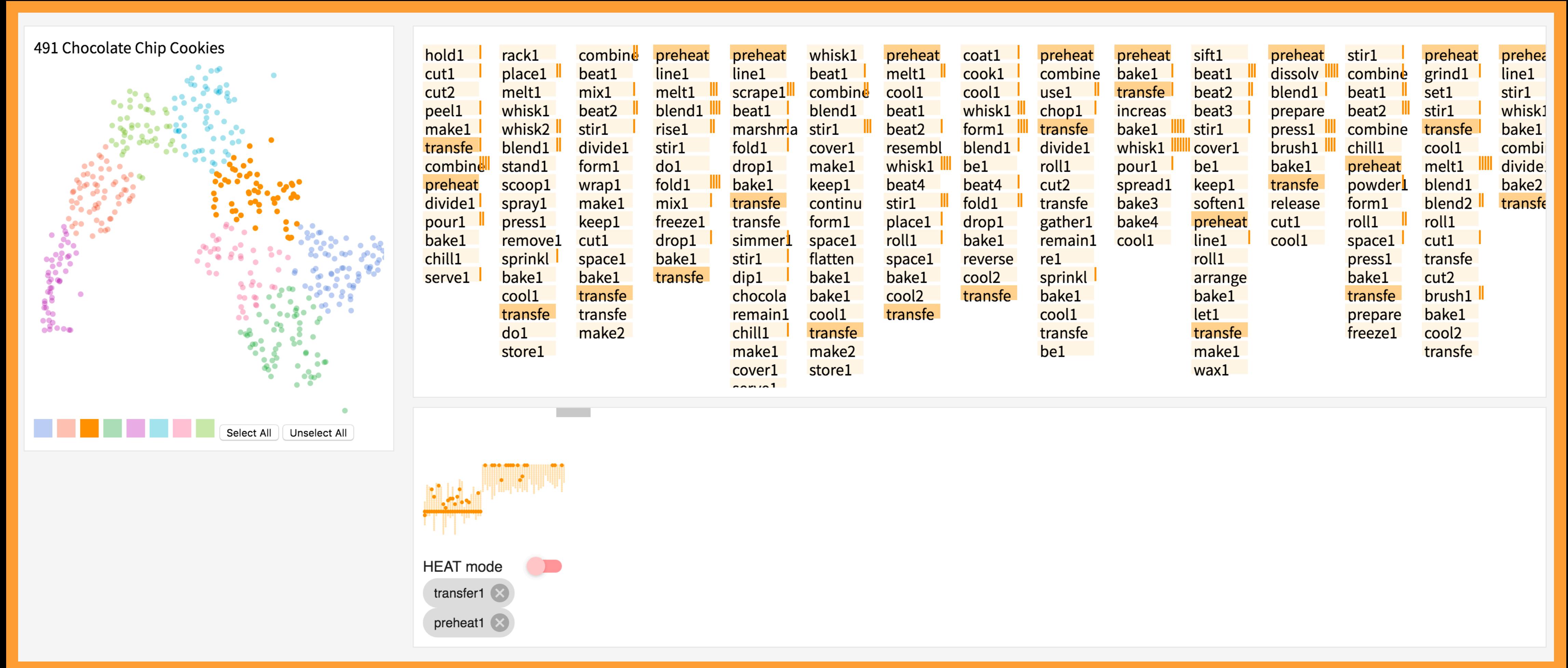


HEAT mode

preheat1

bake1

RecipeScape : within clusters



Computational Pipeline behind RecipeScape

Recipe Text

INGREDIENTS

8 ounces unsalted butter (2 sticks; 225g)

1 standard ice cube (about 2 tablespoons; 30mL frozen water)

10 ounces all-purpose flour
(about 2 cups; 280g)

3/4 teaspoon (3g) baking soda

2 teaspoons Diamond Crystal
kosher salt or 1 teaspoon table
salt (4g)

5 ounces granulated sugar
(about 3/4 cup; 140g)

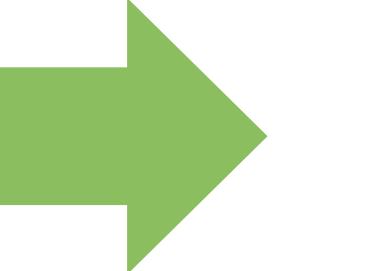
2 large eggs (100g)
2 teaspoons (10mL) vanilla extract

5 ounces dark brown sugar
(about 1/2 tightly packed cups)
plus 2 tablespoons; 140g)

8 ounces (225g) semisweet chocolate, roughly chopped with a knife into 1/2- to 1/4-inch chunks

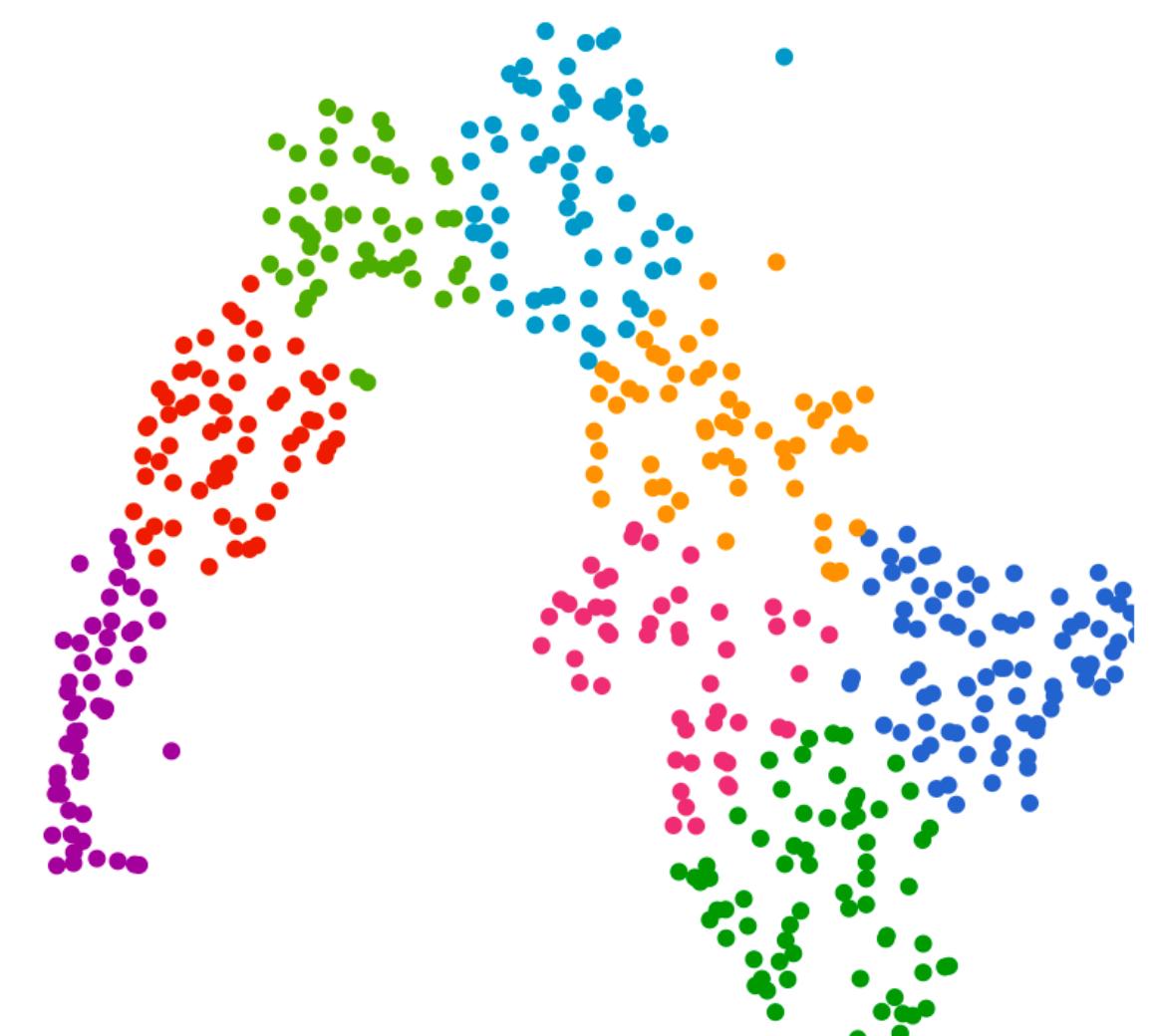
DIRECTIONS

1. Melt butter in a medium saucepan over medium-high heat. Cook, gently swirling pan constantly, until particles begin to turn golden brown and butter smells nutty, about 5 minutes. Remove from heat and continue swirling the pan until the butter is a rich brown, about 15 seconds longer. Transfer to a medium bowl, whisk in ice cube, transfer to refrigerator, and allow to cool completely, about 20 minutes, whisking occasionally. (Alternatively, whisk over an ice bath to hasten the process.)
 2. Meanwhile, whisk together flour, baking soda, and salt in a large bowl. Place granulated sugar, eggs, and vanilla extract in the bowl of a stand mixer fitted with the whisk attachment. Whisk on medium-high speed until mixture is pale brownish-yellow and falls off the whisk in thick ribbons when lifted, about 5 minutes.
 3. Fit paddle attachment onto mixer. When brown butter mixture has cooled (it should be just starting to turn opaque again and firm around the edges), add brown sugar and cooled brown butter to egg mixture in stand mixer. Mix on medium speed to combine, about 15 seconds. Add flour mixture and mix on low speed until just barely combined, with some dry flour still remaining, about 15 seconds. Add chocolate and mix on low speed until dough comes together, about 15 seconds longer. Transfer to an airtight container and refrigerate dough at least overnight and up to 3 days.



RecipeScape

491 Chocolate Chip Cookies



How to extract structural similarity measure from recipe text?

Recipe Text

INGREDIENTS

8 ounces unsalted butter (2 sticks; 225g)

1 standard ice cube (about 2 tablespoons; 30mL frozen water)

10 ounces all-purpose flour (about 2 cups; 280g)

3/4 teaspoon (3g) baking soda

2 teaspoons Diamond Crystal kosher salt or 1 teaspoon table salt (4g)

5 ounces granulated sugar (about 3/4 cup; 140g)

2 large eggs (100g)

2 teaspoons (10mL) vanilla extract

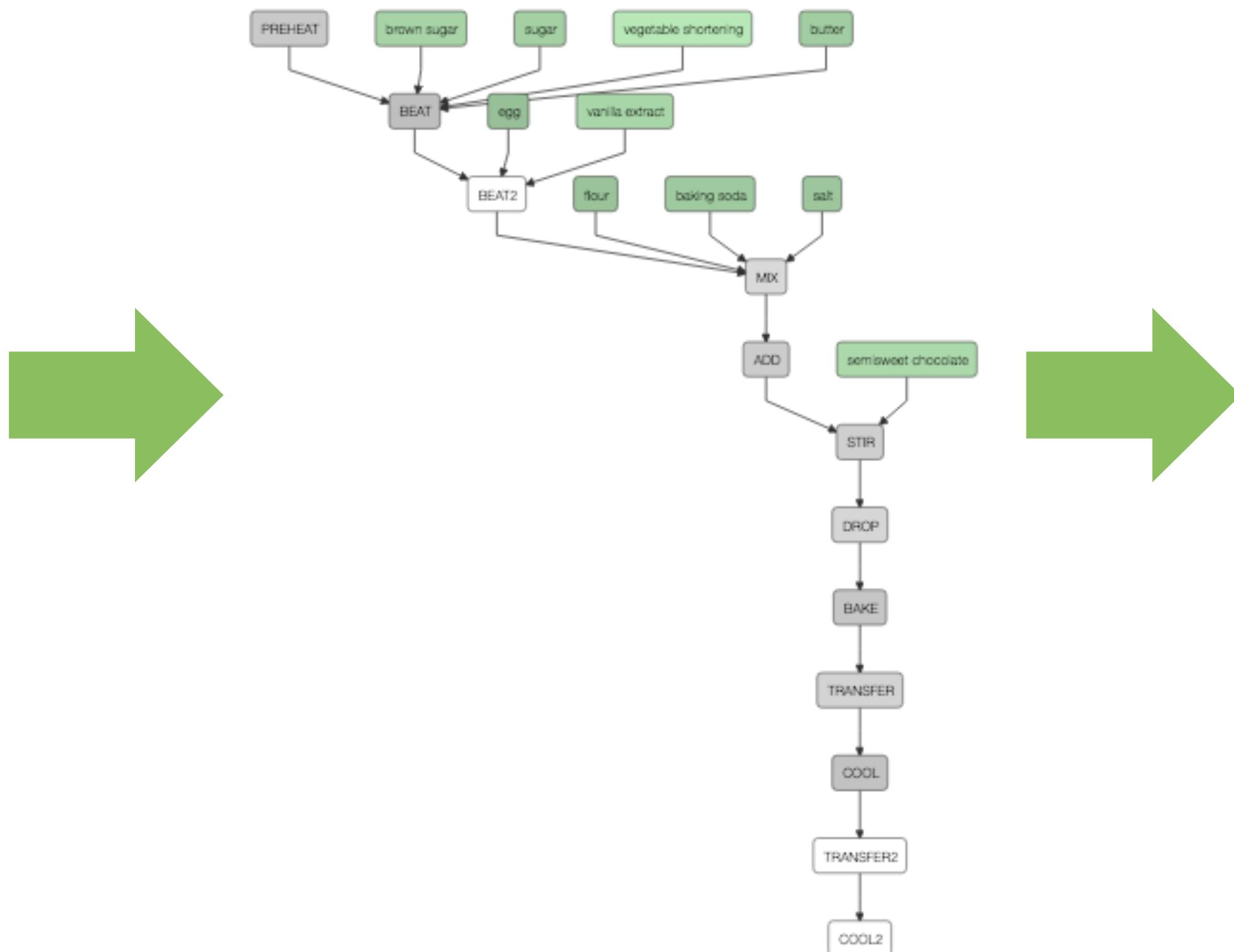
5 ounces dark brown sugar (about 1/2 tightly packed cup plus 2 tablespoons; 140g)

8 ounces (225g) semisweet chocolate, roughly chopped with a knife into 1/2- to 1/4-inch chunks

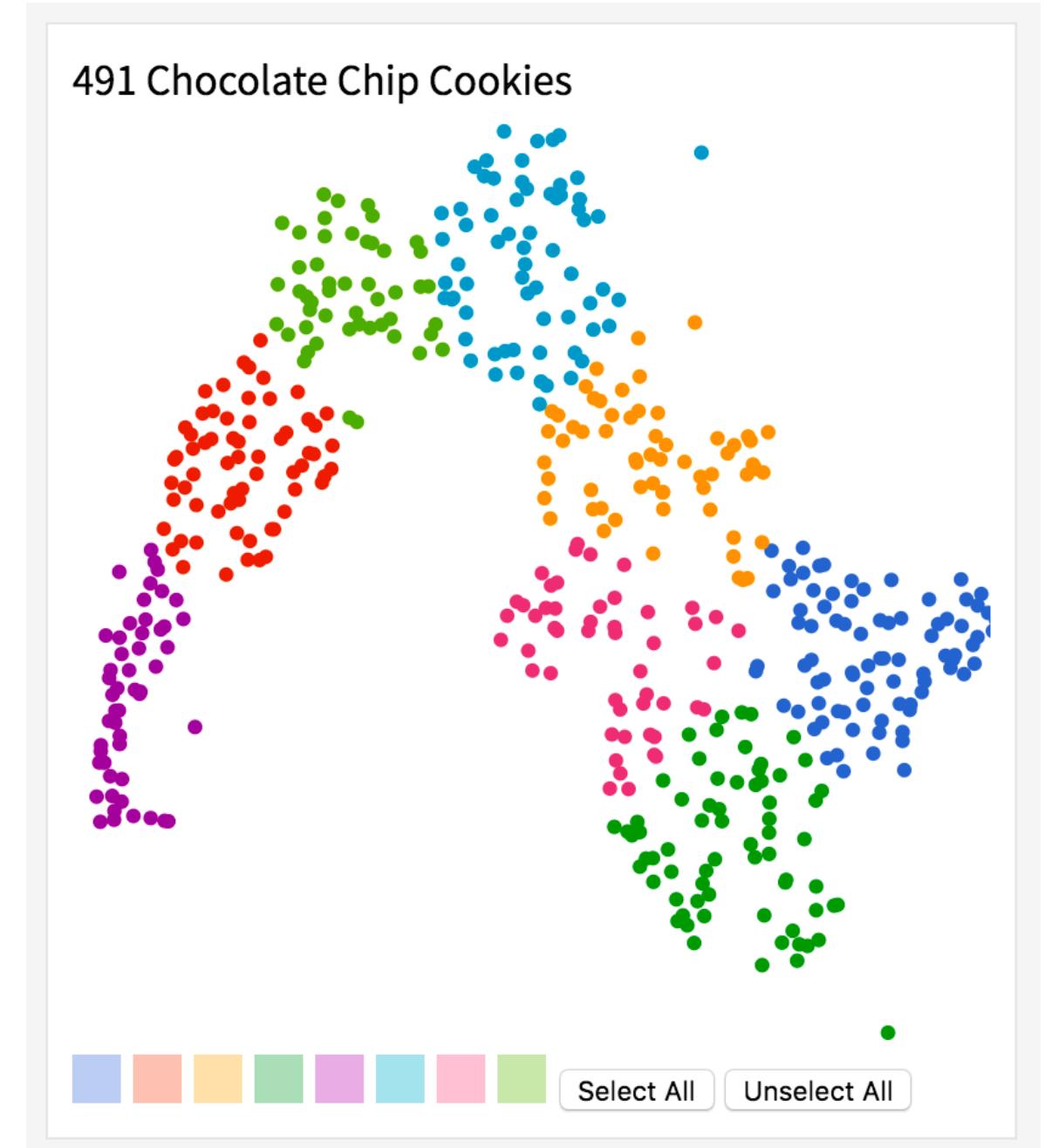
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Graphical Representation



RecipeScape



Step 1: Scrape online recipes

The screenshot shows the epicurious homepage with a prominent search bar at the top right. Below the search bar, there are several navigation links: RECIPES & MENUS, EXPERT ADVICE, INGREDIENTS, HOLIDAYS & EVENTS, COMMUNITY, VIDEO, and GIFT GUIDE. The main content area features a recipe card for "CHOCOLATE-CHOCOLATE CHIP COOKIE AND STRAWBERRY GELATO SANDWICHES". The title is displayed in large, bold, black capital letters. Below the title, it says "BY GABE SORIA & AMANDA ZUG-MOORE | BON APPÉTIT MAY 2009". To the right of the title, there is a rating section showing "4/4" with four red forks and knives, followed by "100%" and "REVIEWS (10)". Further down, there is a link "MAKE IT AGAIN". The recipe card has a green border.

INGREDIENTS

- 2 1/4 cups all purpose flour
- 1/2 cup natural unsweetened cocoa powder
- 1 teaspoon baking soda
- 1/2 teaspoon salt
- 1 cup (2 sticks) unsalted butter, room temperature
- 1 cup (packed) dark brown sugar
- 1/2 cup sugar
- 2 large eggs
- 1 teaspoon vanilla extract
- 1/2 teaspoon almond extract
- 2 cups semisweet chocolate chips
- Fresh Strawberry Gelato , slightly softened

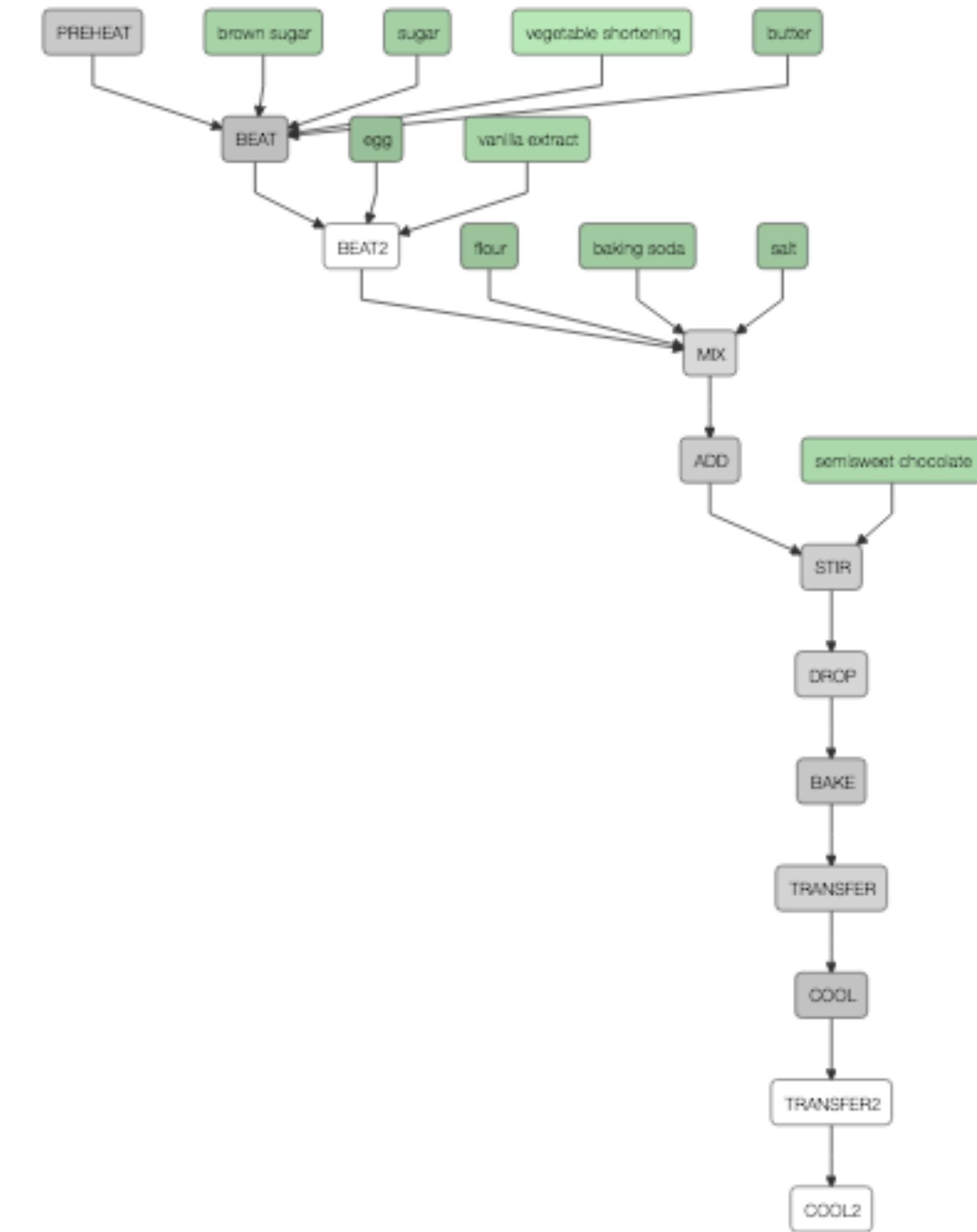
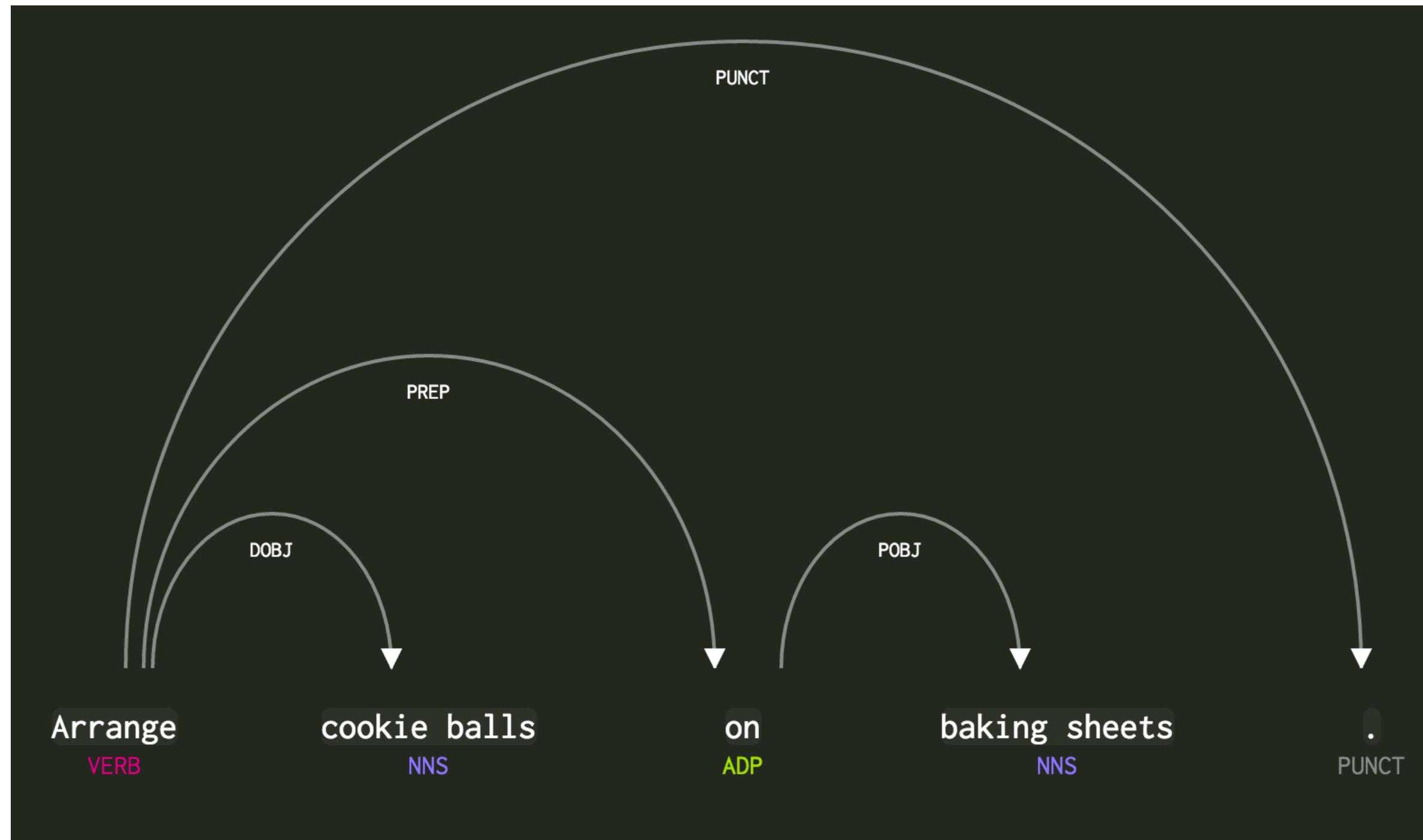
PREPARATION

Preheat oven to 375°F. Line 2 large rimmed baking sheets with parchment. Sift first 4 ingredients into bowl. Using electric mixer, beat butter in large bowl until fluffy. Beat in both sugars, then eggs, 1 at a time. Beat in extracts, then flour mixture. Fold in chocolate chips. Drop batter by heaping tablespoonfuls onto prepared sheets, spacing mounds 2 to 3 inches apart. Using moist fingertips, flatten mounds to 3/4-inch thickness.

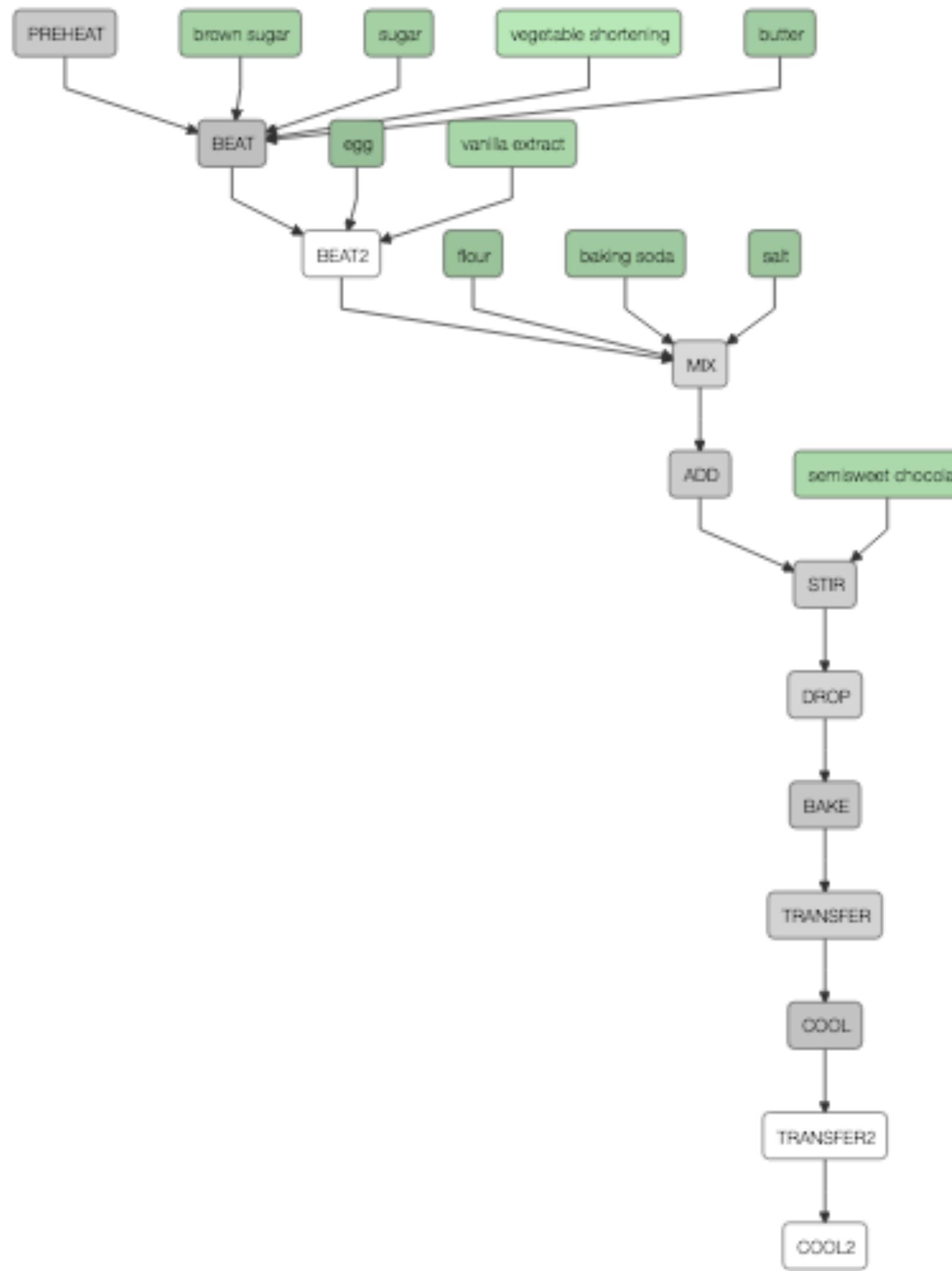
Bake cookies 5 minutes. Reverse sheets. Bake until cookies are puffed and dry-looking but soft to touch, about 5 minutes. Cool completely. Freeze on sheets 15 minutes.

Spoon 1/3 cup gelato onto flat side of 1 cookie. Top with second cookie, flat side down; press together. Wrap and freeze. Repeat with remaining gelato and cookies. DO AHEAD: *Keep frozen up to 2 days.*

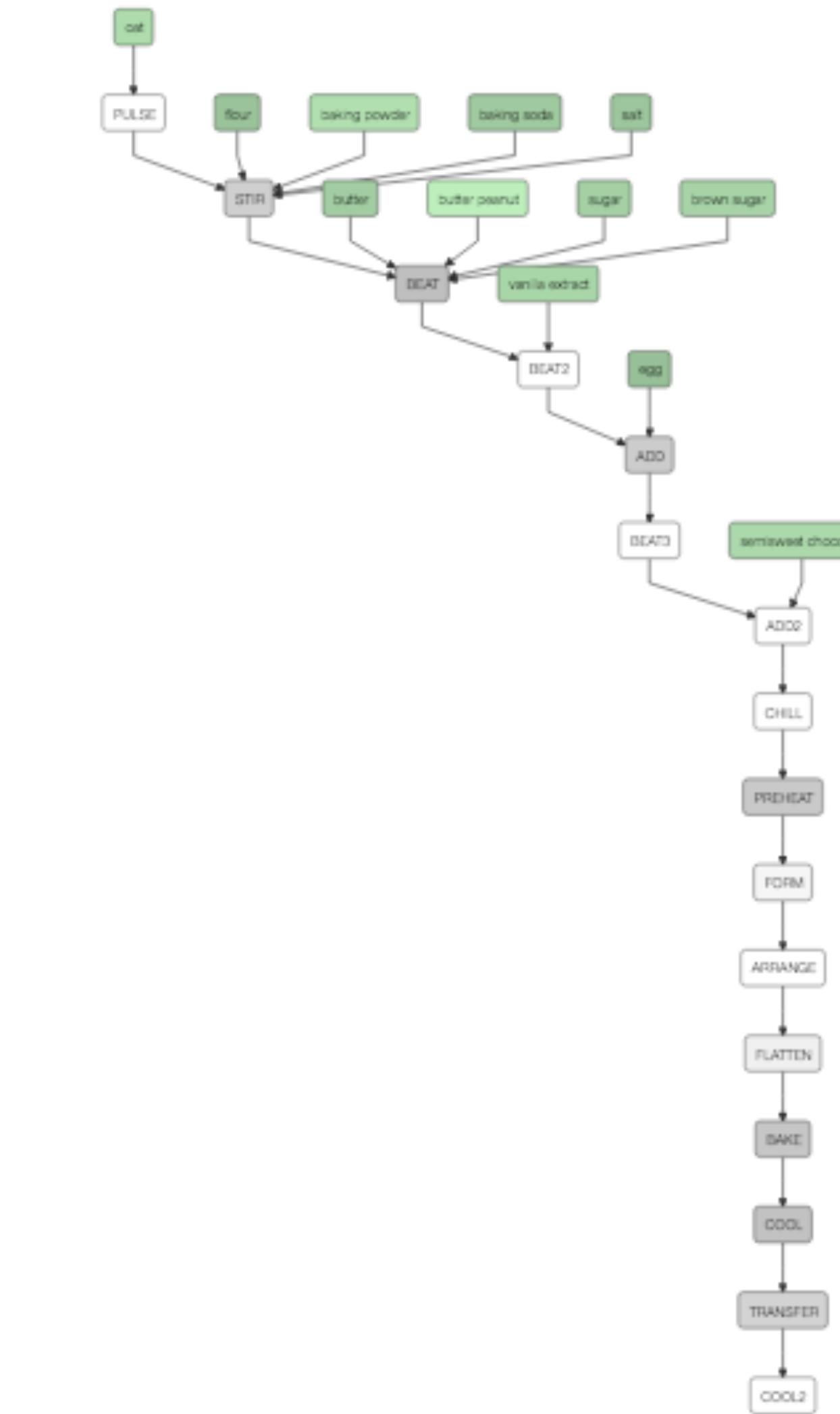
Step 2: Parse recipes and produce a tree



Step 3: Compute similarity between recipe topologies



VS

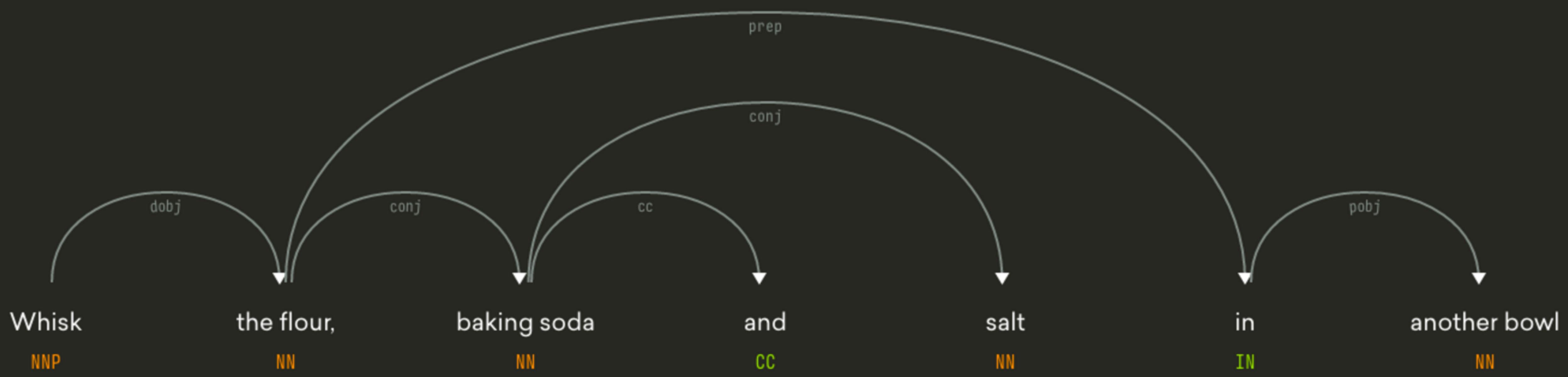


Step 4: Visualize & support analytics

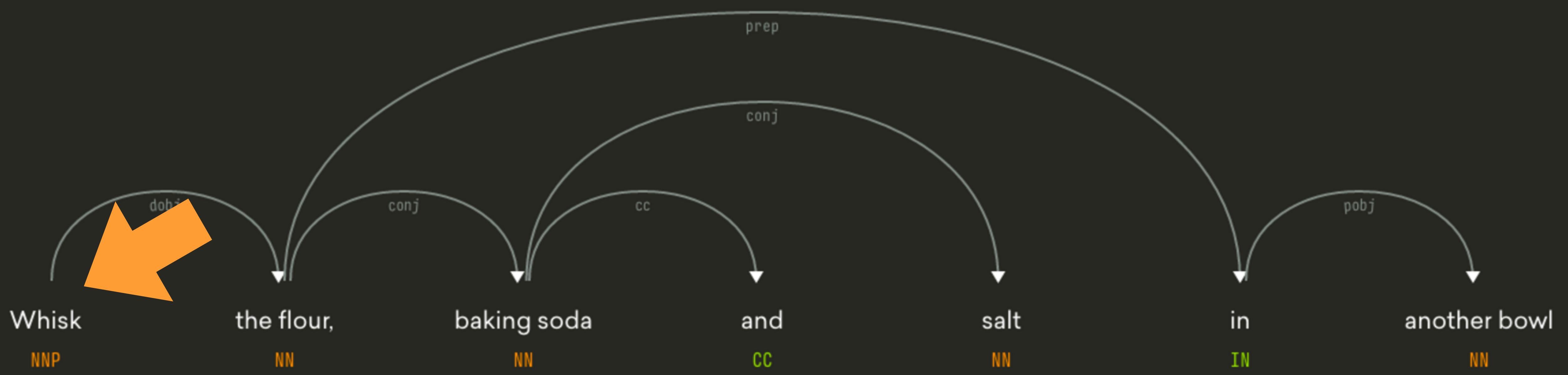
RecipeScape Prototype Interface

The interface consists of several interconnected components:

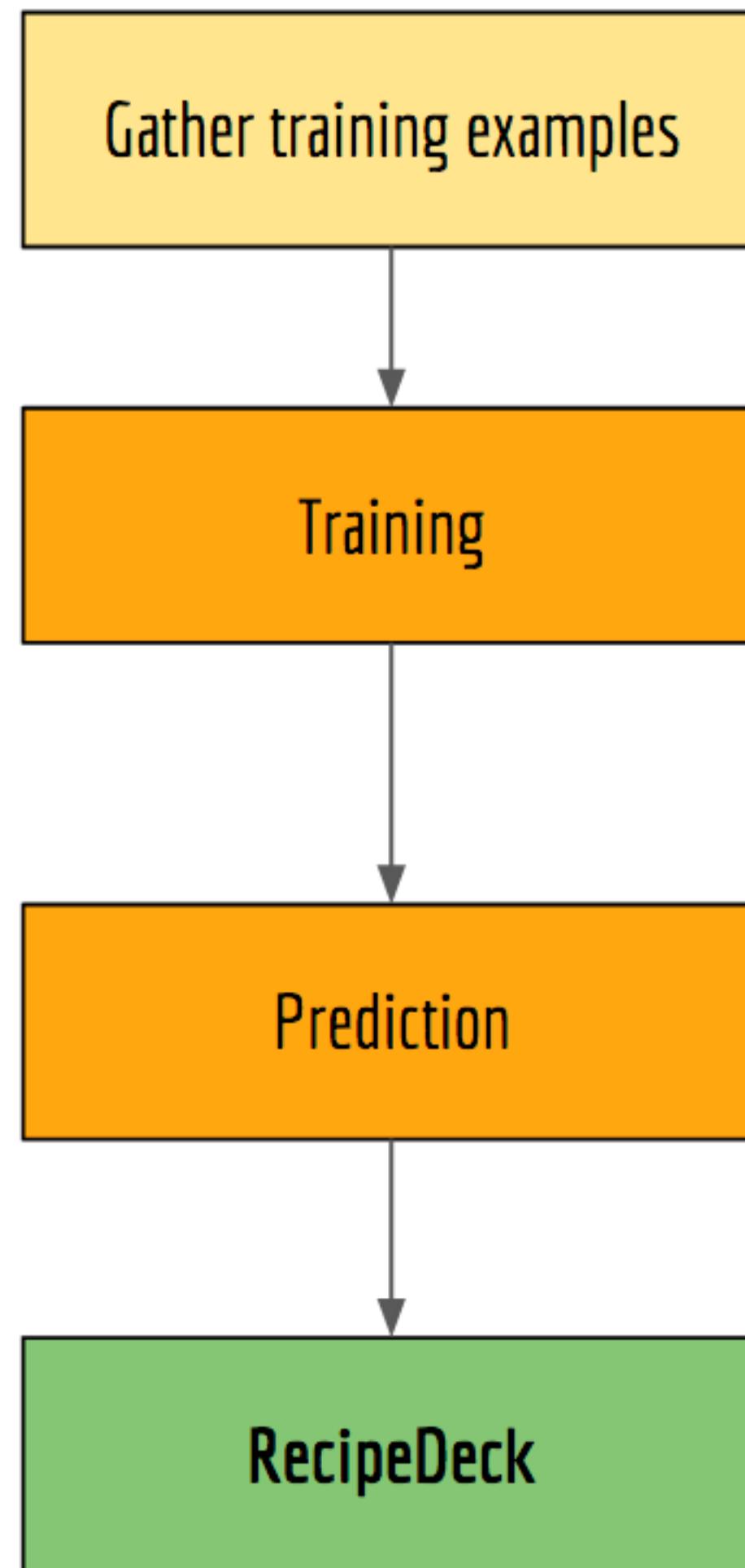
- Individual View:** A detailed view of a single recipe (e.g., "White Chocolate Chip and Cashew Cookies") showing ingredients and steps.
- Pairwise Comparison View (High Similarity):** Compares two recipes (e.g., "Chocolate Chip Cookies" vs "Coconut Chocolate Chip").
- Pairwise Comparison View (Low Similarity):** Compares two recipes (e.g., "Pumpkin Spice Latte" vs "Double French Vanilla Chocolate Chip Cookies").
- RecipeMap:** A cluster-based visualization of 491 Chocolate Chip Cookies. It shows clusters of recipes color-coded by similarity. A legend indicates colors for Select All, Unselect All, and individual clusters.
- Ingredients:** A list of cooking actions categorized by ingredients.
- Recipe as a sequence:** A sequence editor showing a timeline of cooking actions.
- HEAT mode:** A switch to enable heatmap highlighting.
- Click:** An annotation pointing to a specific action in the sequence editor.
- Highlights selected cluster:** An annotation indicating the selected cluster in the RecipeMap.
- Automatically updates RecipeDeck to show recipes in the selected cluster:** An annotation explaining how the RecipeDeck updates based on the selected cluster.
- RecipeDeck:** A large grid of cooking actions (e.g., preheat, stir, mix) color-coded by frequency or relevance.
- Sequence Editor:** A grid-based sequence editor where users can highlight sequences of actions.
- Select action(s):** An annotation pointing to the sequence editor.
- Highlights heat related cooking actions:** An annotation pointing to the RecipeDeck grid.
- HEAT mode:** A switch to enable heatmap highlighting in the sequence editor.
- Return the pan to the oven for 1 minute:** A tooltip for a highlighted action in the sequence editor.
- Hover to see the whole description of the cooking step:** A tooltip for a highlighted action in the sequence editor.
- aligns sequences around first selected action (preheat) to help to discover trends and order constraints:** An annotation explaining the purpose of the sequence editor's highlighting feature.



Problem 1: Decomposing and detecting cooking actions from the sentences



Problem 1: Decomposing and detecting
cooking actions from the
sentences



- 1) Upgraded version of NYT Cooking's Ingredient Tagger
How do we collect labeled training examples? → crowdsourcing
- 2) Training: Feed labeled examples to the CRF
ex) Whisk-Verb, Beat-Verb, Salt-Ingredient, etc...
- 3) Run CRF for unlabeled sentences to get cooking verbs
- 4) The cooking verbs are stacked in the order they appear

Recipe Tagger

Navigate

Recipe 1

Sentence 3

GO

NEXT SENTENCE

Sentence

[Sprinkle] with 1/2 cup nuts ; press nuts into dough .

Available Tags

Ingredients

1

Cooking Action

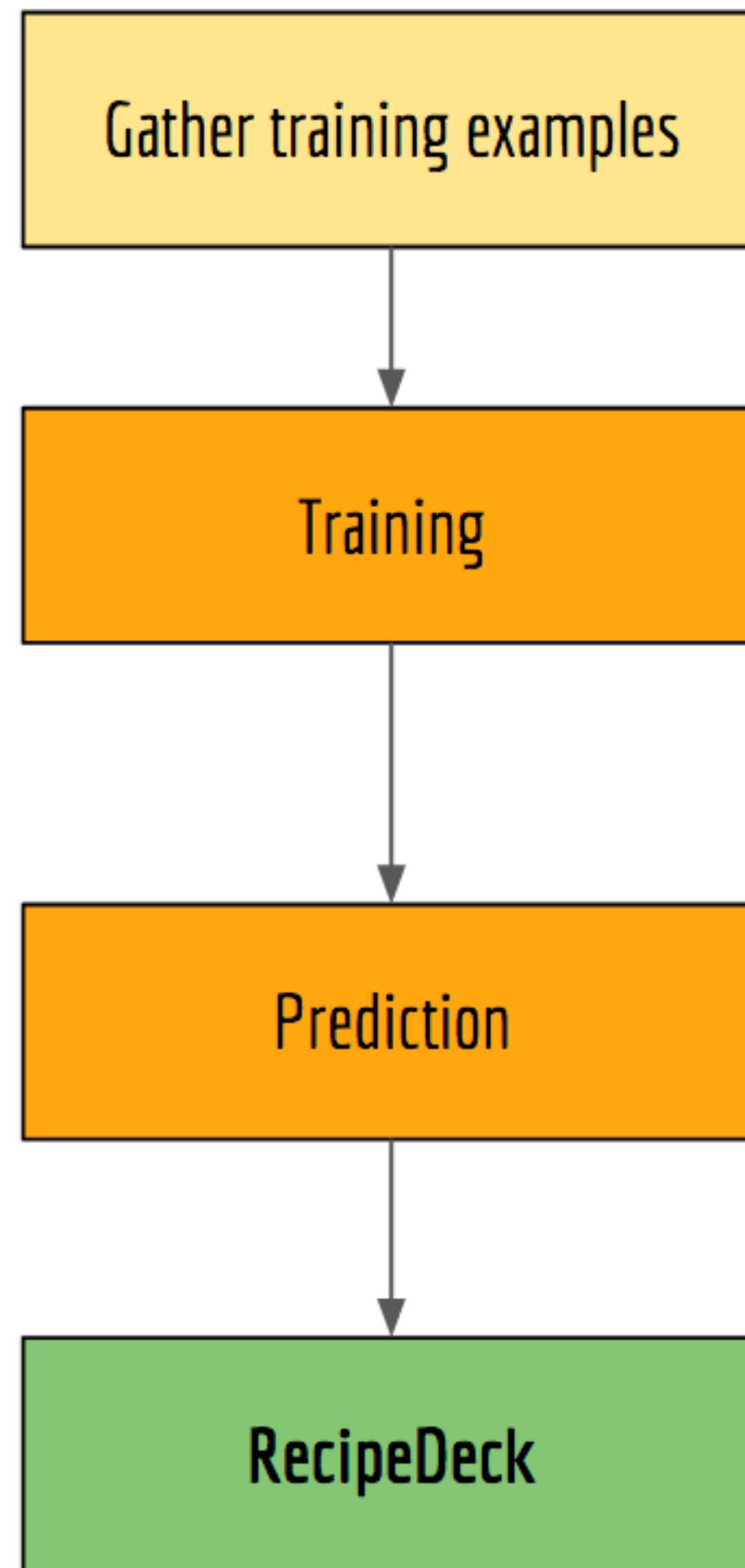
2

Cooking Tool

3

Cancel

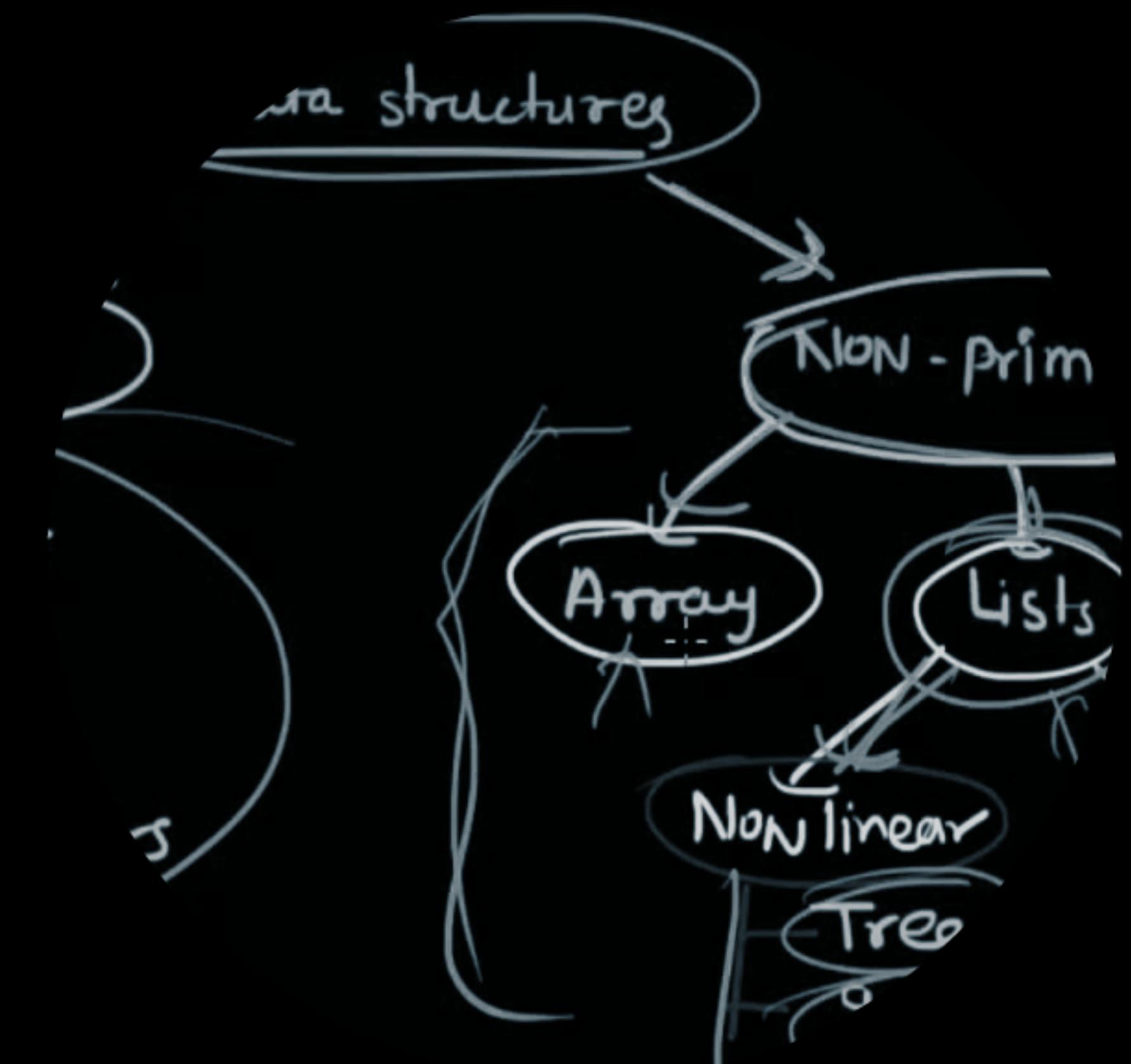
4



- 1) Upgraded version of NYT Cooking's Ingredient Tagger
How do we collect labeled training examples? → crowdsourcing
- 2) Training: Feed labeled examples to the CRF
ex) Whisk-Verb, Beat-Verb, Salt-Ingredient, etc...
- 3) Run CRF for unlabeled sentences to get cooking verbs
- 4) The cooking verbs are stacked in the order they appear

Problem 2:

Finding the appropriate representation for recipes!



PREPARATION

Preheat oven to 160°C (325°F). Place the butter, both the sugars, egg, vanilla, flour, baking soda and cocoa in a food processor and process until a dough forms.

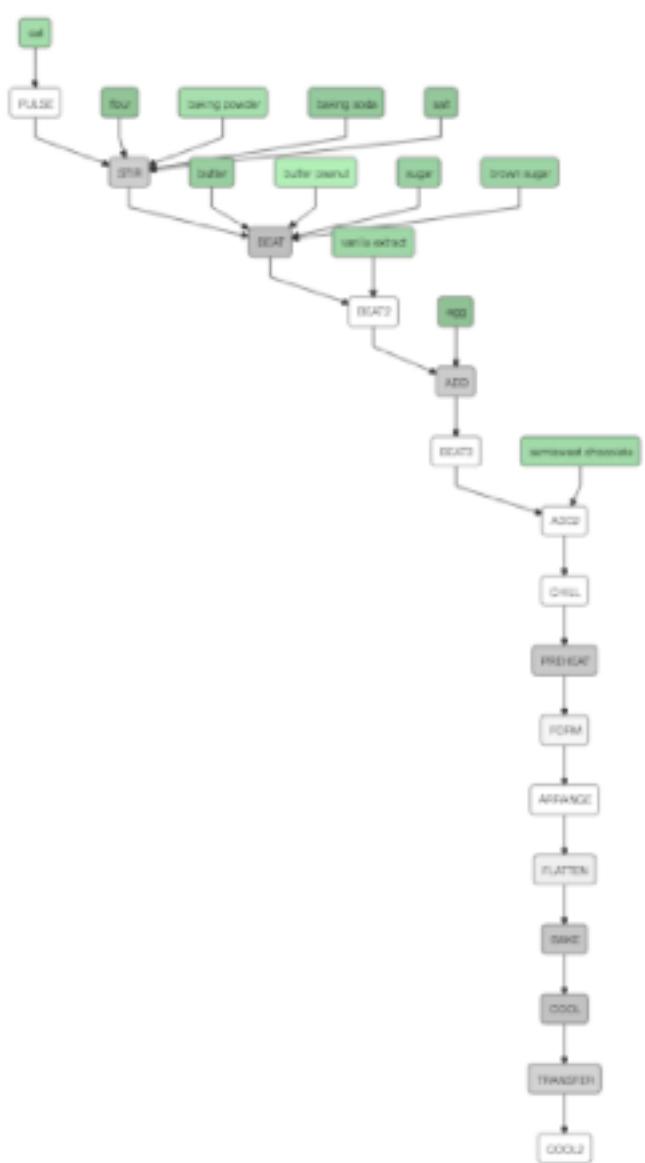
Press the dough out to a 10-inch round on a baking tray lined with non-stick baking paper, scatter with the chocolate and lightly press the pieces into the dough. Bake for 15–20 minutes or until firm to the touch. Allow to cool slightly on the tray. Serve warm with ice cream and caramel sauce.

NLP

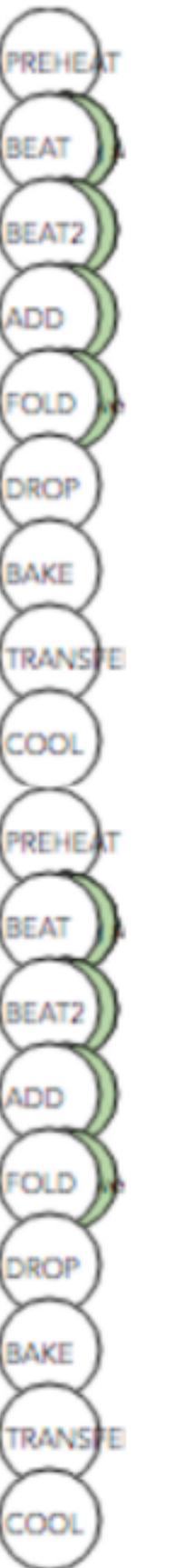
Cooking Action	Ingredient
Preheat	
Place	{Butter, sugar, egg, r...}
Process	
...	



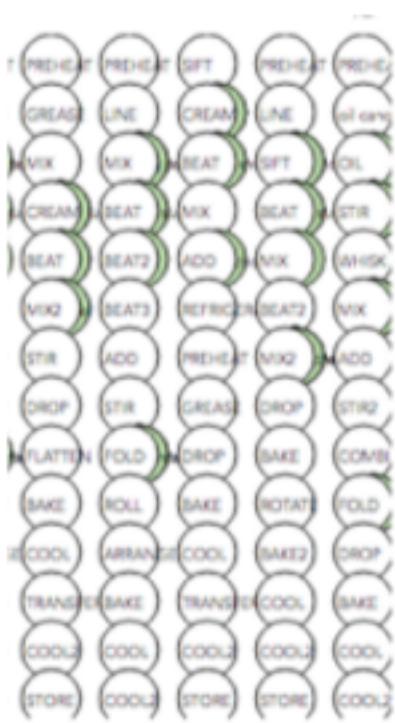
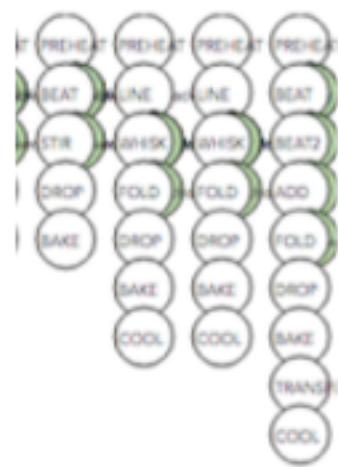
Tree
Construction

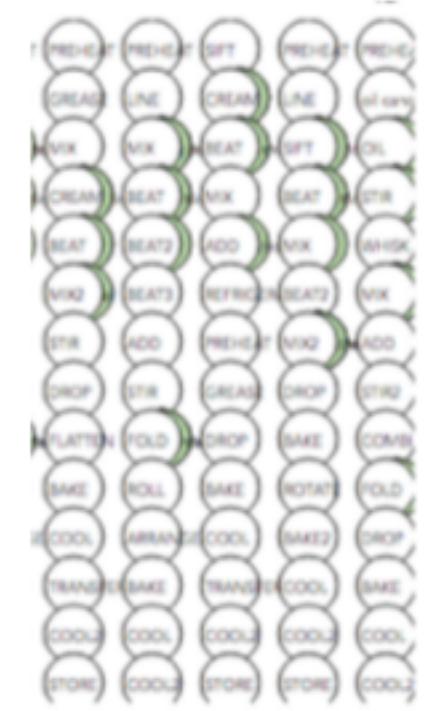
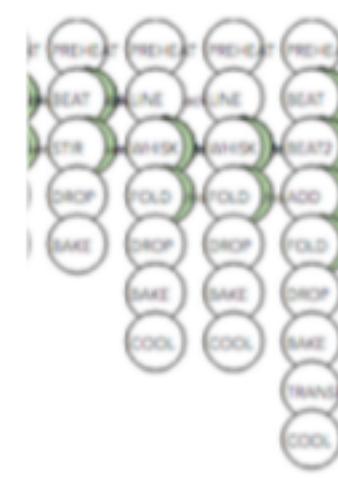


Topological Sort



Repeat all steps upto here for all Recipes

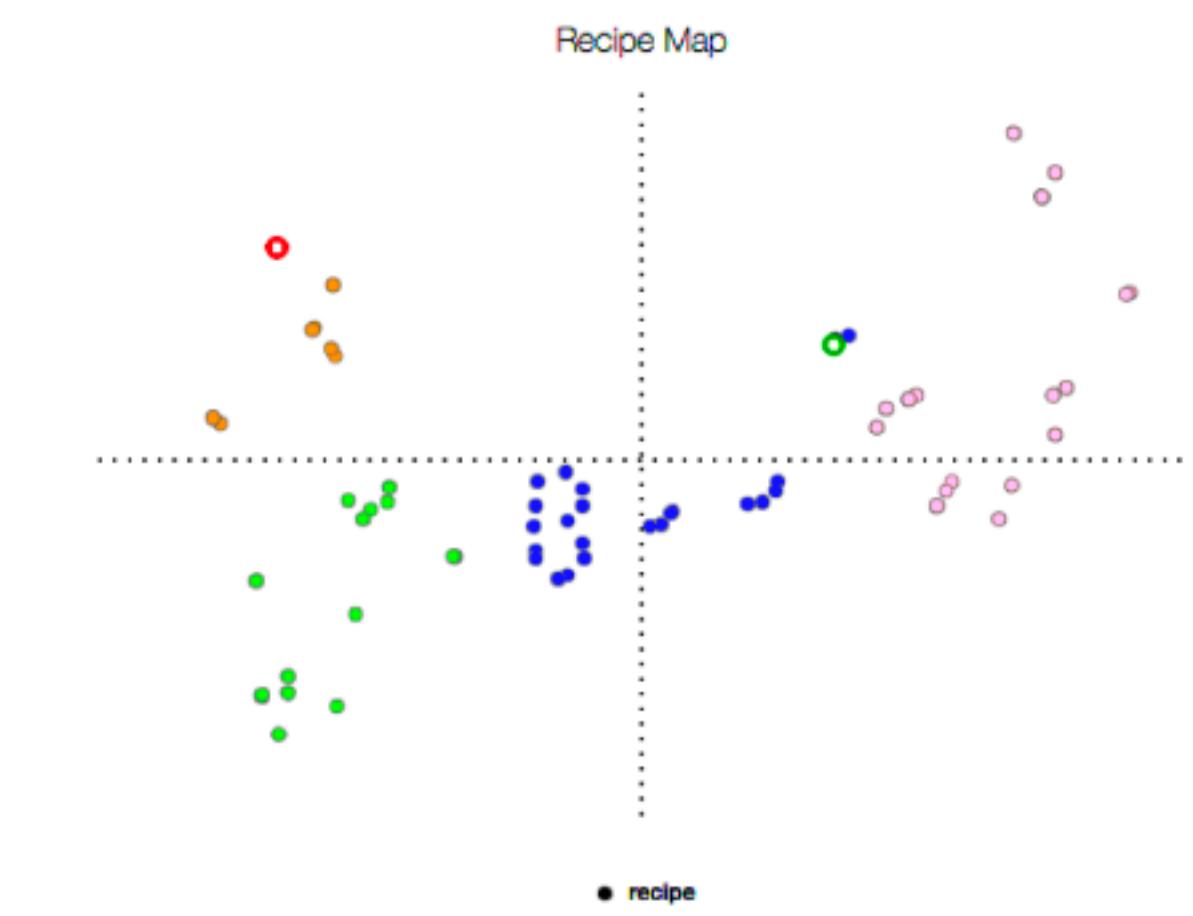




Edit Distance

	Recipe 1	...	Recipe N
Recipe 1			
...			
Recipe N			

T-SNE



VISION AND NEXT STEPS

- Cookie icon RecipeScape: Recipe analytics tool
- Cookie icon Analyzing cooking recipes in aggregate and at scale helps us better understand collective knowledge and practice around cooking.
- Cookie icon Generalizable technique. Interesting & fun applications like makeup instructions, travel guides, path planning etc
- Cookie icon Cooking is essentially applying different kinds of heat transfer to various ingredients. How can we utilize this insight?
- Cookie icon Can we augment all recipes to support learning/cooking applications?
- Cookie icon Video-based recipes?



Kixlab

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RECIPE TAGGER INTERFACE

Recipe Tagger

Navigate

Recipe 1 Sentence 3 GO NEXT SENTENCE

Sentence

[Sprinkle] with 1/2 cup nuts ; press nuts into dough .

Available Tags

Ingredients Cooking Action Cooking Tool Cancel

1 2 3 4

RecipeScape Prototype Interface

Individual View

Select individual recipe

Pairwise Comparison View (High Similarity)

Select two nearby recipes

Pairwise Comparison View (Low Similarity)

Select two recipes

Highlights selected cluster

Automatically updates RecipeDeck to show recipes in the selected cluster

Select cluster from color map

RecipeMap

Click

Ingredients

preheat	cut1	split1	make1	place1	combine	heat1	line1	preheat	spray1	whisk1	drop1	stir1	spray1	put1
cut1	make1	expose1	scald1	season1	raisel	bel	melt1	coat1	remain1	press1	freeze1	press1	whisk1	whisk1
form1	expose1	roll1	squeeze	arrange	coat1	pour1	pour1	remain1	sprinkl	stir1	beat1	chill1	stir1	stir1
sprinkl	roll1	make1	roll1	combine	bake1	scatter	store1	set1	scraps1	beat2	beat1	heat1	beat2	beat1
bake1	make1	line1	include	bake1	roll1	pour1	store1	set1	freeze1	gather1	sift1	remove1	add1	reduce1
top1	line1	chop1	chop1	heat1	roll1	cool1	cool1	cut1	wrap1	roll1	roll1	roll1	roll1	bake1
														bake1

RecipeDeck

preheat	cut1	split1	make1	place1	combine	heat1	line1	preheat	spray1	whisk1	drop1	stir1	spray1	put1
cut1	make1	expose1	scald1	season1	raisel	bel	melt1	coat1	remain1	press1	freeze1	press1	whisk1	whisk1
form1	expose1	roll1	squeeze	arrange	coat1	pour1	pour1	remain1	sprinkl	stir1	beat1	chill1	stir1	stir1
sprinkl	roll1	make1	roll1	combine	bake1	scatter	store1	set1	scraps1	beat2	beat1	heat1	beat2	beat1
bake1	make1	line1	include	bake1	roll1	cool1	cool1	set1	freeze1	gather1	sift1	remove1	add1	reduce1
top1	line1	chop1	chop1	heat1	roll1	cool1	cool1	cut1	wrap1	roll1	roll1	roll1	roll1	bake1
														bake1

HEAT mode

Highlights heat related cooking actions

Select action(s)

HEAT mode

aligns sequences around first selected action (preheat) to help to discover trends and order constraints

Return the pan to the oven for 1 minute.

Hover to see the whole description of the cooking step

d1	preheat	stir1	beat1	sift1	arrange	rack1	combine	beat1	rack1	set1	whisk1	c
s1	line1	stir2	beat2	blend1	place1	beat2	beat2	beat2	beat2	simmer1	beat1	c
e1	preheat	whisk1	hold1	blend2	set1	beat1	beat2	beat3	beat1	beat1	beat1	v
z1	line1	chill1	preheat	use1	mel1	beat1	beat2	beat2	beat1	grind1	beat1	f
l1	preheat	chill2	hold2	shape1	set2	beat1	beat2	beat3	beat1	cool1	beat1	t
o1	line1	cool1	removel	shapel	mel2	beat1	beat2	beat2	beat1	lighten1	beat1	b
u1	preheat	stir1	remove1	beat1	mel3	beat1	beat2	beat3	beat1	cover1	beat1	b
u1	line1	stir2	place1	beat2	mel4	beat1	beat2	beat2	beat1	keep1	beat1	b
u1	preheat	stir3	removel	beat3	mel5	beat1	beat2	beat2	beat1	combining	beat1	b
u1	line1	stir4	place1	beat4	mel6	beat1	beat2	beat2	beat1	makel	beat1	b
u1	preheat	stir5	removel	beat5	mel7	beat1	beat2	beat2	beat1	keep2	beat1	b
u1	line1	stir6	place1	beat6	mel8	beat1	beat2	beat2	beat1	drop1	beat1	b
u1	preheat	stir7	removel	beat7	mel9	beat1	beat2	beat2	beat1	mix1	beat1	b
u1	line1	stir8	place1	beat8	mel10	beat1	beat2	beat2	beat1	reduce1	beat1	b
u1	preheat	stir9	removel	beat9	mel11	beat1	beat2	beat2	beat1	set1	beat1	b
u1	line1	stir10	place1	beat10	mel12	beat1	beat2	beat2	beat1	simmer1	beat1	b
u1	preheat	stir11	removel	beat11	mel13	beat1	beat2	beat2	beat1	beat1	beat1	b
u1	line1	stir12	place1	beat12	mel14	beat1	beat2	beat2	beat1	grind1	beat1	b
u1	preheat	stir13	removel	beat13	mel15	beat1	beat2	beat2	beat1	cool1	beat1	b
u1	line1	stir14	place1	beat14	mel16	beat1	beat2	beat2	beat1	lighten1	beat1	b
u1	preheat	stir15	removel	beat15	mel17	beat1	beat2	beat2	beat1	cover1	beat1	b
u1	line1	stir16	place1	beat16	mel18	beat1	beat2	beat2	beat1	keep1	beat1	b
u1	preheat	stir17	removel	beat17	mel19	beat1	beat2	beat2	beat1	combining	beat1	b
u1	line1	stir18	place1	beat18	mel20	beat1	beat2	beat2	beat1	makel	beat1	b
u1	preheat	stir19	removel	beat19	mel21	beat1	beat2	beat2	beat1	keep2	beat1	b
u1	line1	stir20	place1	beat20	mel22	beat1	beat2	beat2	beat1	drop1	beat1	b
u1	preheat	stir21	removel	beat21	mel23	beat1	beat2	beat2	beat1	mix1	beat1	b
u1	line1	stir22	place1	beat22	mel24	beat1	beat2	beat2	beat1	reduce1	beat1	b
u1	preheat	stir23	removel	beat23	mel25	beat1	beat2	beat2	beat1	set1	beat1	b
u1	line1	stir24	place1	beat24	mel26	beat1	beat2	beat2	beat1	simmer1	beat1	b
u1	preheat	stir25	removel	beat25	mel27	beat1	beat2	beat2	beat1	beat1	beat1	b
u1	line1	stir26	place1	beat26	mel28	beat1	beat2	beat2	beat1	grind1	beat1	b
u1	preheat	stir27	removel	beat27	mel29	beat1	beat2	beat2	beat1	cool1	beat1	b
u1	line1	stir28	place1	beat28	mel30	beat1	beat2	beat2	beat1	lighten1	beat1	b
u1	preheat	stir29	removel	beat29	mel31	beat1	beat2	beat2	beat1	cover1	beat1	b
u1	line1	stir30	place1	beat30	mel32	beat1	beat2	beat2	beat1	keep1	beat1	b
u1	preheat	stir31	removel	beat31	mel33	beat1	beat2	beat2	beat1	combining	beat1	b
u1	line1	stir32	place1	beat32	mel34	beat1	beat2	beat2	beat1	makel	beat1	b
u1	preheat	stir33	removel	beat33	mel35	beat1	beat2	beat2	beat1	keep2	beat1	b
u1	line1	stir34	place1	beat34	mel36	beat1	beat2	beat2	beat1	drop1	beat1	b
u1	preheat	stir35	removel	beat35	mel37	beat1	beat2	beat2	beat1	mix1	beat1	b
u1	line1	stir36	place1	beat36	mel38	beat1	beat2	beat2	beat1	reduce1	beat1	b
u1	preheat	stir37	removel	beat37	mel39	beat1	beat2	beat2	beat1	set1	beat1	b
u1	line1	stir38	place1	beat38	mel40	beat1	beat2	beat2	beat1	simmer1	beat1	b
u1	preheat	stir39	removel	beat39	mel41	beat1	beat2	beat2	beat1	beat1	beat1	b
u1	line1	stir40	place1	beat40	mel42	beat1	beat2	beat2	beat1	grind1	beat1	b
u1	preheat	stir41	removel	beat41	mel43	beat1	beat2	beat2	beat1	cool1	beat1	b
u1	line1	stir42	place1	beat42	mel44	beat1	beat2	beat2	beat1	lighten1	beat1	b
u1	preheat	stir43	removel	beat43	mel45	beat1	beat2	beat2	beat1	cover1	beat1	b
u1	line1	stir44	place1	beat44	mel46	beat1	beat2	beat2	beat1	keep1	beat1	b
u1	preheat	stir45	removel	beat45	mel47	beat1	beat2	beat2	beat1	combining	beat1	b
u1	line1	stir46	place1	beat46	mel48	beat1	beat2	beat2	beat1	makel	beat1	b
u1	preheat	stir47	removel	beat47	mel49	beat1	beat2	beat2	beat1	keep2	beat1	b
u1	line1	stir48	place1	beat48	mel50	beat1	beat2	beat2	beat1	drop1	beat1	b
u1	preheat	stir49	removel	beat49	mel51	beat1	beat2	beat2	beat1	mix1	beat1	b
u1	line1	stir50	place1	beat50	mel52	beat1	beat2	beat2	beat1	reduce1	beat1	b
u1	preheat	stir51	removel	beat51	mel53	beat1	beat2	beat2	beat1	set1	beat1	b
u1	line1	stir52	place1	beat52	mel54	beat1	beat2	beat2	beat1	simmer1	beat1	b
u1	preheat	stir53	removel	beat53	mel55	beat1	beat2	beat2	beat1	beat1	beat1	b
u1	line1	stir54	place1	beat54	mel56	beat1	beat2	beat2	beat1	grind1	beat1	b
u1	preheat	stir55	removel	beat55	mel57	beat1	beat2	beat2				