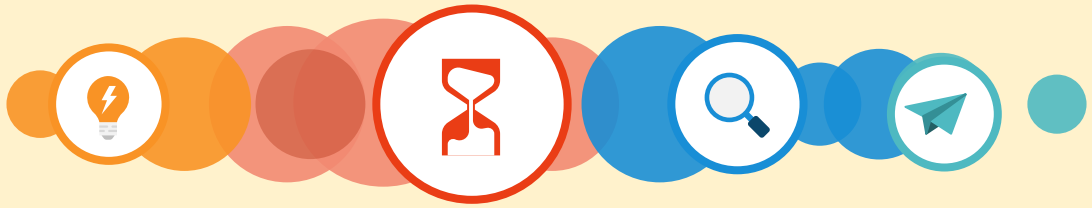
Presentation-3
September, 28



Novel Recipe Generation

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TASKS GIVEN

- COMPUTE PMF(Probability Mass Function) AND CDF(Cumulative Distribution Function) VALUES FOR EACH INGREDIENT
- DRAW THE PMF PLOT AND CDF PLOT for the RecipeDB dataset
- GENERATE A RANDOM NO. FROM 1 TO 8 (Recipe Size)
- GENERATE A RECIPE OF SIZE equal to the random number generated
  INGREDIENTS ARE chosen randomly without replacement with predefined probabilities (decided based on their frequency of use/popularity), by mapping a random number picked from a uniform distribution to the desired probability distribution. Generate 500 recipes in the same manner.

LET US NOW DISCUSS THE WORKFLOW

PMF (Probability Mass Function for an ingredient with recipe count equal to 'x')

= No. of ingredients with recipe count equal to x / Total number of ingredients

Percentage of ingredients having recipe count equal to x

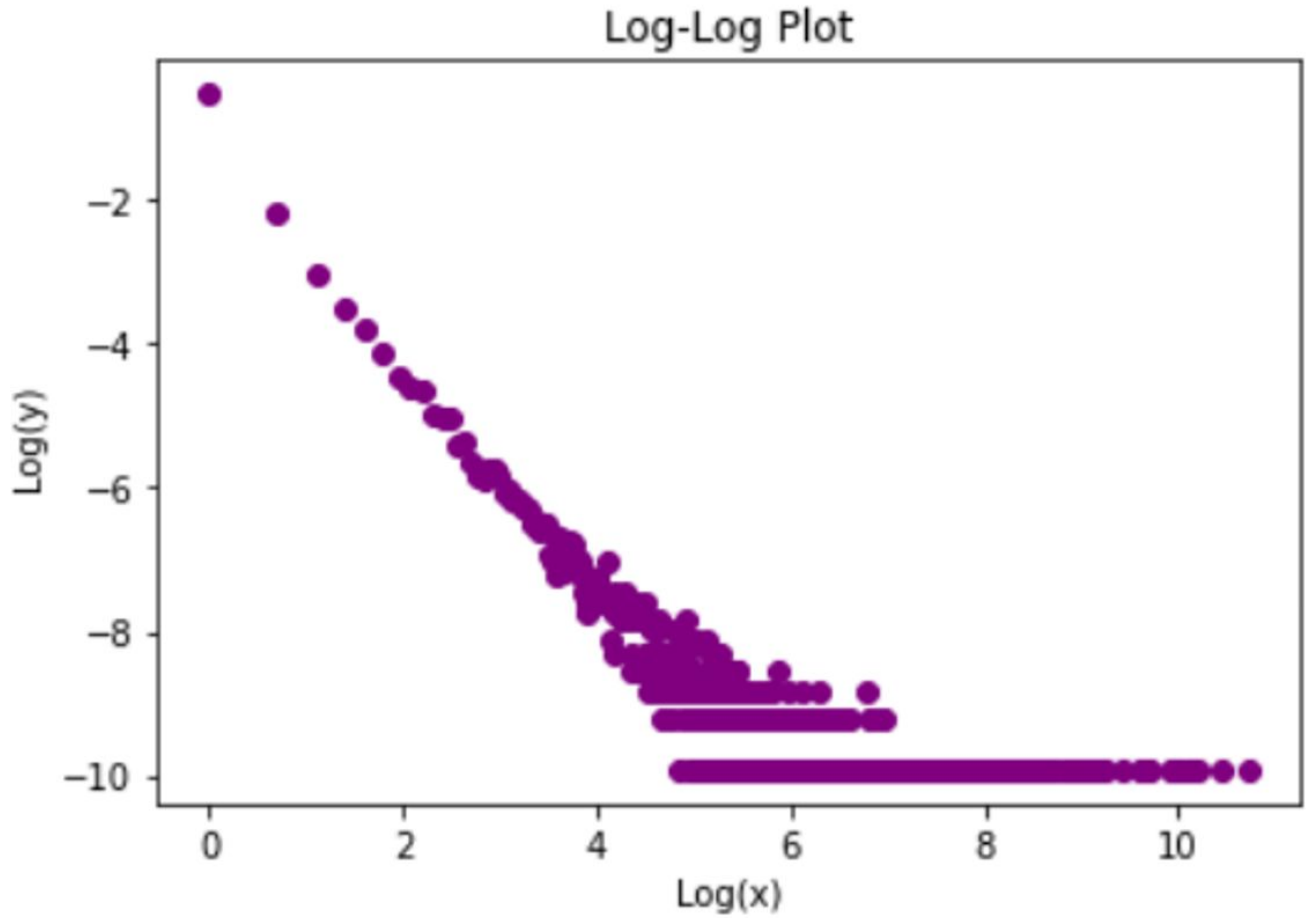
CDF (Cumulative Distribution Function for an ingredient with recipe count equal to ‘x’)
= Sum of the PMF’s of all the ingredients with recipe count greater than or equal to ‘x’

	ingredient	Recipe_Count	Pmf	Cdf
0	salt	45206	0.000049	0.000049
1	onion	34544	0.000049	0.000099
2	butter	27012	0.000049	0.000148
3	garlic clove	24893	0.000049	0.000197
4	water	24775	0.000049	0.000247
5	olive oil	22391	0.000049	0.000296
6	egg	21860	0.000049	0.000345
7	sugar	20271	0.000049	0.000394
8	tomato	16622	0.000049	0.000444
9	black pepper	15973	0.000049	0.000493
10	garlic	15436	0.000049	0.000542
11	milk	14588	0.000049	0.000592
12	pepper	12304	0.000049	0.000641
13	salt pepper	10387	0.000049	0.000690
14	flour	9836	0.000049	0.000740
15	parsley	9718	0.000049	0.000789

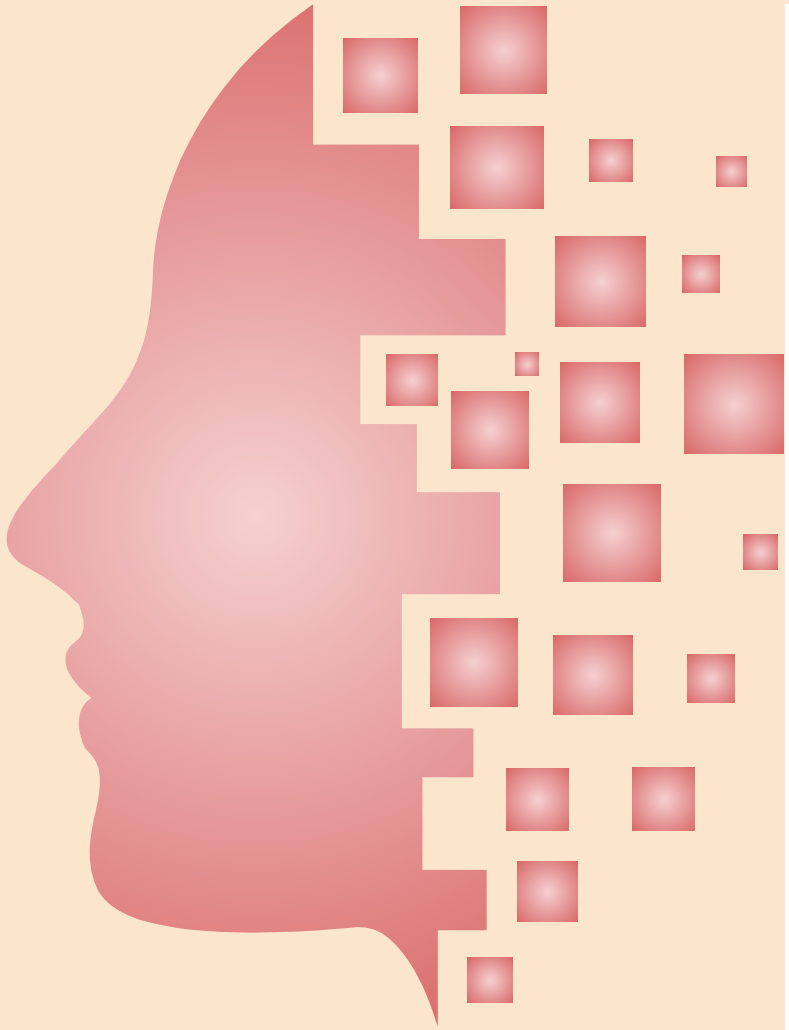
20268	baby leek green part	1	0.590376	1.0
20269	brown stock chicken broth	1	0.590376	1.0
20270	champagne sparkling wine	1	0.590376	1.0
20271	snow pea sprout shoot	1	0.590376	1.0
20272	berry fruit	1	0.590376	1.0
20273	jaboticaba	1	0.590376	1.0
20274	fruit bread white	1	0.590376	1.0
20275	crocodile tail steak	1	0.590376	1.0
20276	tic toc biscuit	1	0.590376	1.0
20277	musk lifesaver five flavor candy	1	0.590376	1.0
20278	capsicum salsa	1	0.590376	1.0
20279	kitchen aluminum foil	1	0.590376	1.0
20280	butternut pumpkin mm	1	0.590376	1.0
20281	german chamomile	1	0.590376	1.0

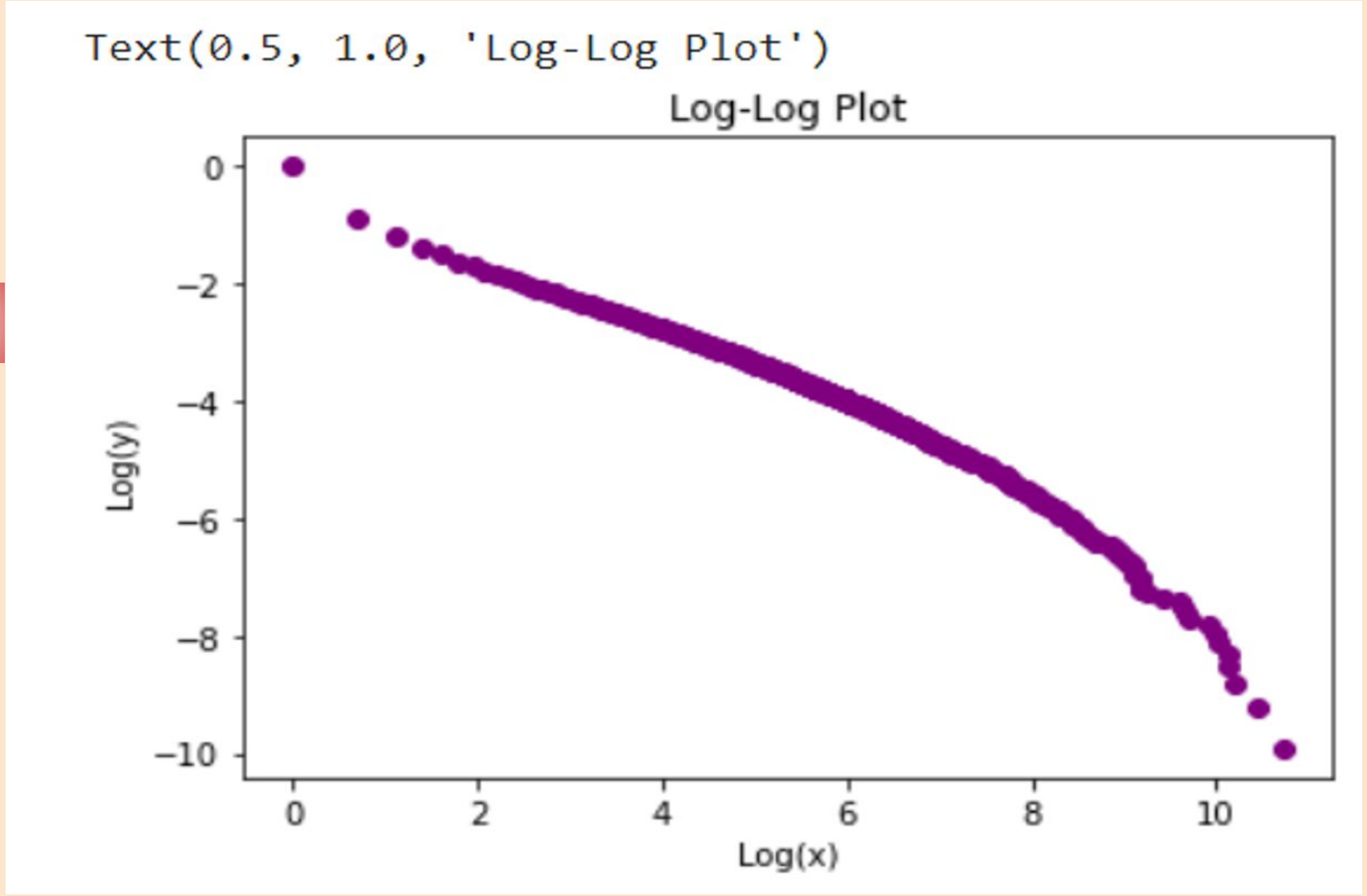
The PMF LOG-LOG PLOT For The RecipeDB

```
Text(0.5, 1.0, 'Log-Log Plot')
```



THE CDF LOG-LOG PLOT FOR THE RECIPEDB





takeRandomInput Function Workflow

01 Step 1

Take random number between 1 to 8.Say n.

02 Step 2

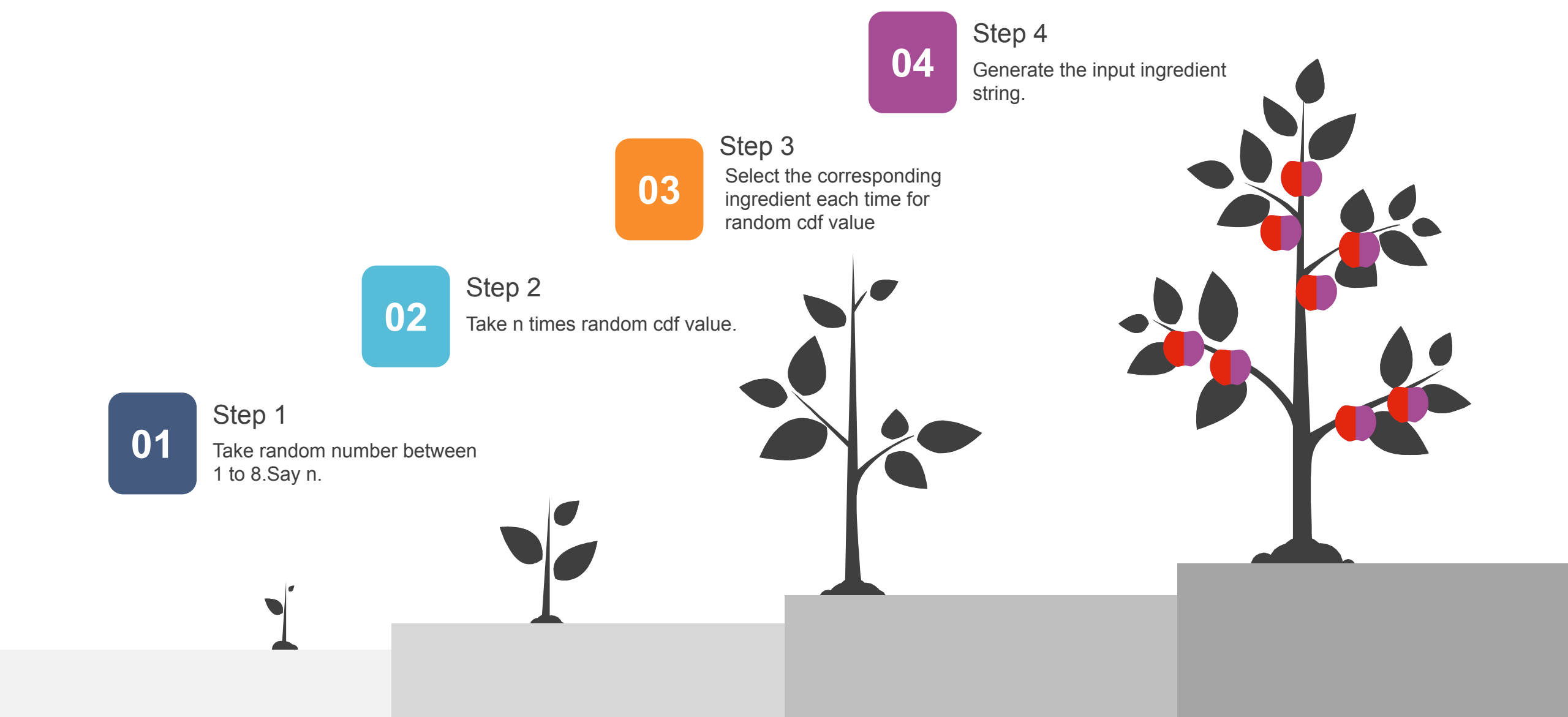
Take n times random cdf value.

03 Step 3

Select the corresponding ingredient each time for random cdf value

04 Step 4

Generate the input ingredient string.



startRatotouileModel Function Workflow

Step 3
Provide input ingredients to this method as a parameter.

Step 2
Import tokenizer and model from previous work done.

Step 4
Add tags to input ingredients string.

Step 1
Define the model classes for GPT2 model.

Step 5
Generate the novel recipe.

RESULTS

Testing the above methods to generate single recipe with randomly selected ingredients

```
randomIngredients=takeRandomInput()
novelRecipeGenerated=startRatatouileModel(randomIngredients)
```

```
100%|██████████| 768/768 [00:33<00:00, 23.06it/s]
```

```
[44] randomIngredients
```

```
'salad green,beer,chicken broth,beef bouillon cube,safflower oil,mayonnaise,dark brown sugar;'
```

```
[45] generated_recipe = str(novelRecipeGenerated.replace('<TITLE_START>', '## Recipe Name:- ##\n').replace('<TITLE_END>', '\n')) \
                            .replace('<INGR_START>', '\n## Ingredients ##\n    -').replace('<NEXT_INGR>', '\n    -').replace('<INGR_END>', '\n\n') \
                            .replace('<INSTR_START>', '## Cooking instructions ##\n    -').replace('.','.\n    -').replace('<NEXT_INSTR>', '\n    -').replace('- <INSTR_END>',
                            .replace(' <RECIPE_END>', '\n\n\n\nVoila Enjoy your recipe :)\n\n\n\n\n\n ----------\n')
```

```
[46] generated_recipe
```

```
'## Recipe Name:- ##\n Tilsiter Beef Bananas \n \n## Ingredients ##\n    - 3 tablespoons safflower oil, not olive oil \n    - 2 1/2 lbs prime rib-cut beef top sirloin steak, all visible fat removed, cut into 1/2-inch dice \n    - 1 1/2 cups low sodium chicken broth \n    - 3/4 cup light beer \n    - 1/4 cup light mayonnaise \n    - 1 beef bouillon cube, crushed \n    - safflower oil ( for frying ) \n    - salad greens \n    - diced dark brown sugar \n\n ## Cooking instructions ##\n    - Heat oil in 12 inch nonstick skillet over medium heat until just shimmering \n    - Add beef <INSTR_END>\n\n\n\nVoila Enjoy your recipe :)\n\n\n\n\n\n ----------\n <RECIPE_START> <INPUT_START > chinese five spice powder <NEXT_INPUT> ginger <NEXT_INPUT> lemon juice <NEXT_INPUT> brown sugar <NEXT_INPUT> onion <NEXT_INPUT> molasses <NEXT_INPUT> water <NEXT_INPUT> beef shoulder <NEXT_INPUT> salt <NEXT_INPUT> allspice <NEXT_INPUT> sauce <NEXT_INPUT> paprika <NEXT_INPUT> black pepper <NEXT_INPUT> clove <NEXT_INP...'
```

THANK YOU