Computational Gastronomy MiDSem Exam

72 responses

Student Details

Name of the student (exactly as in the IIIT-Delhi records)

72 responses

Tanishi Srivastava

P Vijay Shekhar

Shreya Garg

Kamal Awasthi

Lokesh Malkani

Gayatri Panda

Anamitra Maji

Era Sharma

Kaamraan Khan

Roll Number

72 responses

MT19085

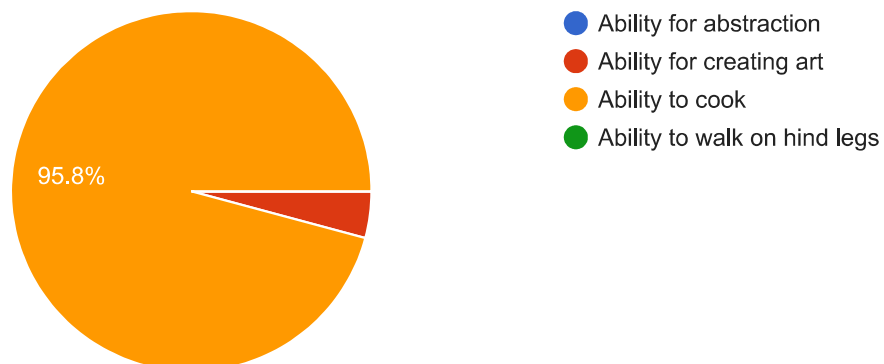MT19040

MT19101

MT20050

MT19007

MT19092

MT19013

MT19218
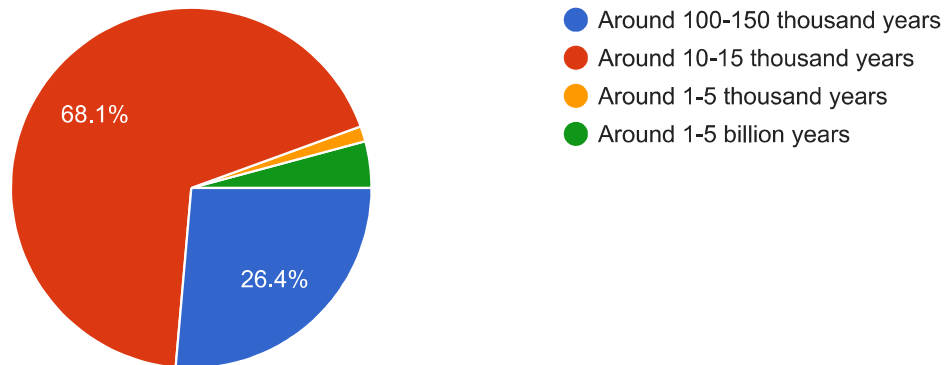
MT20112

Choose the correct alternative.

What is the following has been suggested to be a key factor responsible for the disproportionate brain size of Homo sapiens by Richard Wrangham?
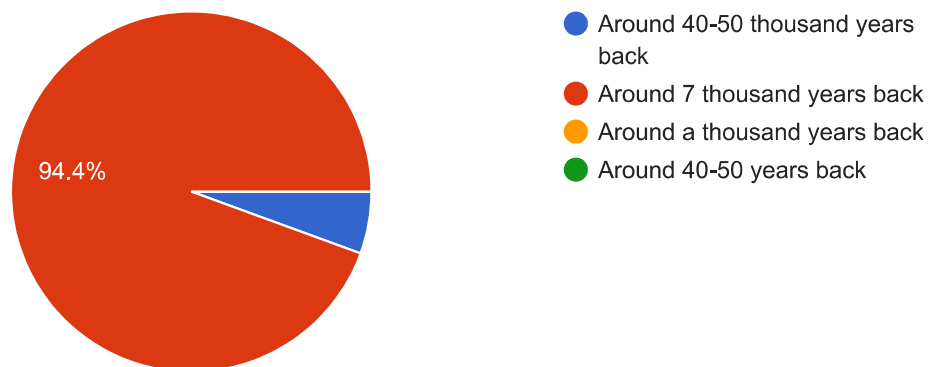
72 responses

- 🔵 Ability for abstraction
- 🔴 Ability for creating art
- 🟠 Ability to cook
- 🟢 Ability to walk on hind legs

95.8%

Barring the invention of roasted meat, how long does the 'history of processed food' stretch back into the human history from today?
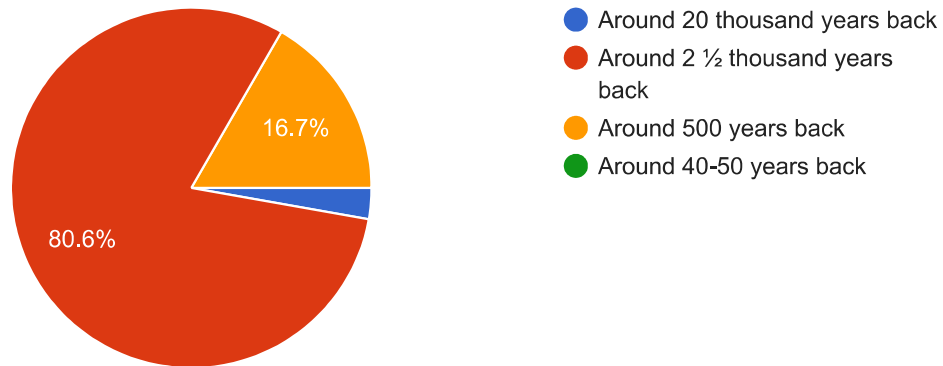
72 responses

- ● Around 100-150 thousand years
- ● Around 10-15 thousand years
- ● Around 1-5 thousand years
- ● Around 1-5 billion years

68.1%

26.4%

Approximately how long back was the oldest wine invented?

72 responses

- ● Around 40-50 thousand years back
- ● Around 7 thousand years back
- ● Around a thousand years back
- ● Around 40-50 years back

94.4%

Approximately how long back was the refined (white) sugar invented?

72 responses

- ● Around 20 thousand years back
- ● Around 2 ½ thousand years back
- ● Around 500 years back
- ● Around 40-50 years back

16.7%

80.6%

Which is the latest entrant to the processed foods' list added as late as 2013, according to the Scientific American's special issue on 'The Science of Food'?

72 responses

- ● Corn flakes
- ● Carbonated water
- ● Lab-grown meat
- ● Kimchi

100%
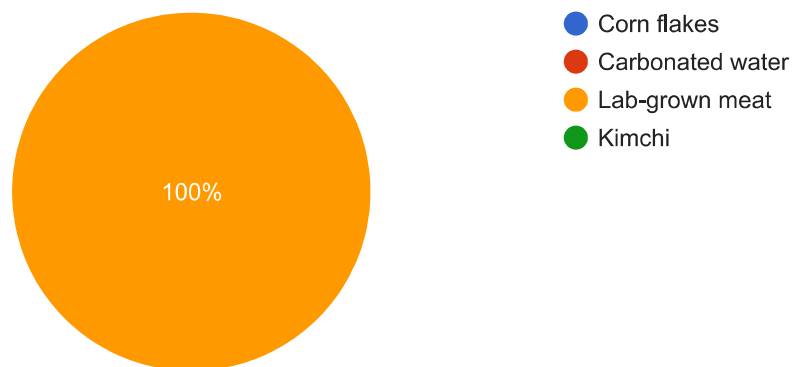
Given that a typical recipe has 10 ingredients in it and that there are around 1000 different ingredients available, what is the number of recipes that can be generated by permutations and combinations?

72 responses

- ~ 〖10〗 ^30
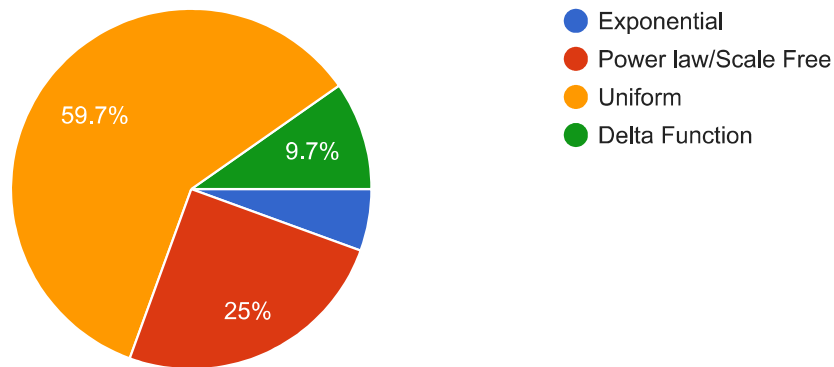- ~ 〖30〗 ^10
- ~ 〖10〗 ^1000
- ~ 〖1000〗 ^10

91.7%
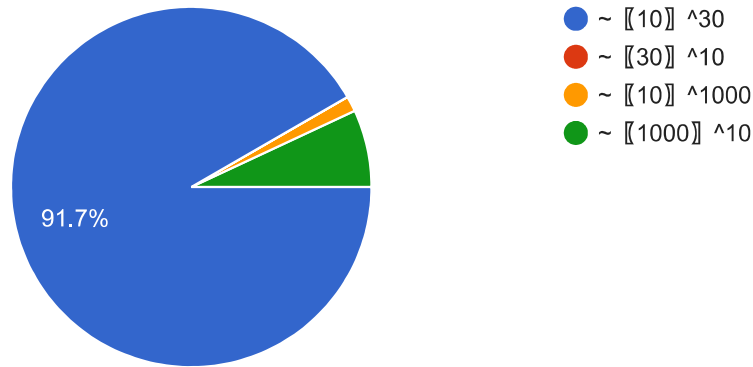
Which of the following distributions best describes the nature of the frequency-rank (ingredient popularity) plot of cuisines from across the world?

72 responses

- Exponential
- Power law/Scale Free
- Uniform
- Gaussian

97.2%
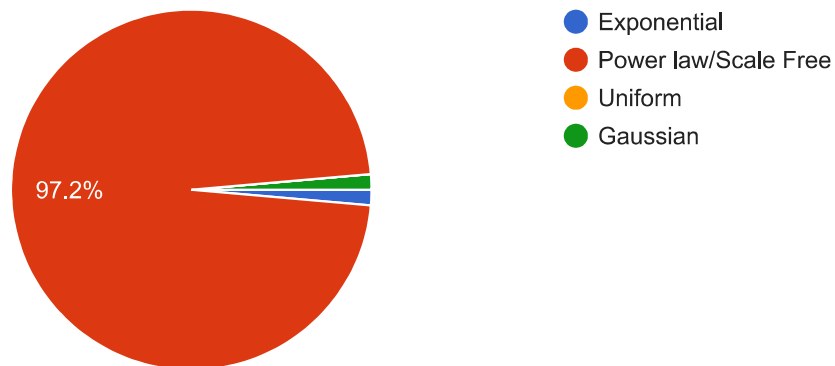
As part of cuisine evolution strategy, starting with a randomized bunch of recipes of a fixed size, copy-mutate strategy was implemented. After 1000 generations what would be the nature of the recipe size distribution of the resulting cuisine?

72 responses

Legend:
- Exponential
- Power law/Scale Free
- Uniform
- Delta Function

Pie chart values: 59.7%, 25%, 9.7%

Answer in brief

Define Computational Gastronomy.

72 responses

Computational Gastronomy is a data science that blends food, data and computation for data driven food innovations.

Computational Gastronomy is a data science that blends food, data, and computation for data-driven food innovations.

Computational Gastronomy is a data science discipline that blends together food, data, computation for data-driven food innovation.

Computational Gastronomy is a field of data science that mix food and data which give us new innovations related to foods and their flavours.

Computational Gastronomy is a branch of data science that blends data, computation and Food for data-driven food innovations.

Computational Gastronomy is a data science technique that uses food, data , and computation for data-driven food innovations.

Name four major "ingredient categories" and write 2-3 examples of ingredients for each.

72 responses

vegetable:- potato, spinach, brinjal
diary:- milk, butter, curd
spices:- cumin, garam masala, cardamom
meat:- chicken, pork, mutton

1. Vegetables: lettuce, peas, potato
2. Fruits: banana, apple, orange
3. Dairy: milk, curd, butter

1. Spice = Clove, Cumin, Turmeric, Cinnamon
2. Herb = Coriander, Rosemary, Mint, Basil
3. Dairy = Milk, Curd/Yogurt, Cream, Butter
4. Nut/ Seed = Peanut, Walnut, Hazelnut, Filbert

The four major ingredient categories are :

1. Vegatables - It includes all kinds of leaf based vegetables (ex : spinatch, etc),
beans (ex : kidney beans etc.) and other kinds of vegetables.

What does MSG stand for? How does it taste?

72 responses

Monosodium Glutamate.
it is used as a taste enhancer in many processed and fast food.
it tastes savory(sweet, sour, bitter, and tangy).

MSG: Monosodium glutamate. Its taste as umami.

MSG stands for Monosodium Glutamate
It tastes Savory

i). MSG stands for Monosodium glutamate.
ii). It has umami or savoriness taste.
iii). It enhances the meaty, savory flavor of food.

MSG stands for MonoSodium Glutamate
It tastes like a Umami, means somewhat meaty/savoury.

MSG stands for monosodium glutamate
Its taste is savoury

Provide brief definitions/descriptions of the following: Cuisine, Ingredient
Category

72 responses

Cuisine:- cuisine is a collection of recipes that are generally influenced by geographic
and cultural factors. Recipes that come under a cuisine tends to be using some of the
ingredients and ingredients categories dominantly. some of the famous cuisines:-
Italian, Mughlai, South Indian, Thai, Mexican, Punjabi, Bengali.

Ingredient Category:- Ingredient Categories are basically categories made to
differentiate among various ingredients based on their usage or their sources or
having similar flavors.
The predominantly consumed food categories are:- vegetables, dairy, meat, spices
and etc.

Cuisine: is a set of recipes of similar geo-cultural origin.
Ingredient Category: is a set of ingredients of similar nature.

Cuisine = Cuisine can be defined as a set of recipes, grouped by either Geographically
or Geo culturally.
Ingredient Category = Ingredient category is a set of ingredients that share similar
nature in terms of their sources.

What are the different analytics that could be done with recipes data? Briefly describe each.

72 responses

different analytics which we can use with the recipes data are as follows:-
1. finding similar cuisines:- by clustering of recipes data we can club cuisines in the clusters.
2. finding culinary fingerprints of food by using food pairings.
3. finding the prominent ingredients and ingredient category in any cuisine:- by simple computation we can have this information.
4. predicting the cuisine of any recipe:- by making ingredients as features and making cuisine as the target variable, we can develop a multi-class classification algorithm for the prediction of the cuisine of the testing recipe.
5. generating new recipes of any particular cuisine using Copy-Mutate models.

1. Recipe : It includes ingredients and its distribution and cooking instructions.
2. Ingredients popularity: ingredients popularity and its patter across cuisines eg: Japanese cuisine is very different from Brazilian cuisine even salt is not common in both but Japanese and Korean cuisine are similar.
3. Category composition.
4. Mining patterns: ingredients pairing and frequent item sets mining.

State all the parameters that are used in the Copy-Mutate model of the Cuisine Evolution.

72 responses

Parameters of Copy-Mutate algorithms are as follows:-
1. Ro:- Initial number of recipes at t=0.
2. T:- total number of recipes to be generated before halting the algorithm.
3. K:- Average recipe size (average no. of ingredients per recipe)
4. L:- the number of ingredients which has to be mutated/ replaced in the mother recipe for each epoch.
5. M:- ingredients pool size/recipes pool size

1. Number of generations
2. Number of Ingredients per recipe
3. Number of ingredients in each recipe to be mutated
3. Initial number of recipe in cuisine
4. Ratio between size of pool of ingredients and pool of recipes.

1. I = List of all available ingredients in the cuisine
2. S bar = Average Recipe size of the cuisine
3. m = Size of initial ingredient list sampled randomly from available ingredient list "I"
4. R0 = Initial recipe formed by choosing "m" ingredients randomly
5. n = size of R0 i.e. initial recipe size

State three major aspects of culinary data with a brief description of each.

72 responses

major aspects of culinary data are:-
1. Recipes:- recipes can be most basically explained as a set of an unordered list of ingredients. But this is only a coarse-grained form of recipe data as it loses the vital information such as the quantity of an ingredient, state of the ingredients, ingredients sequence, platting information and etc.
2. Flavor:- Flavor is basically the taste and odor properties of any ingredient, flavor comes because of flavor molecules. Ingredients can be represented with the unordered list of flavor molecules.
3. Health and Nutrients data:- Each Ingredient can be associated with health impacts which may be positive or negative.

1. Recipes: Information about sequence and size of each and every ingredients.
2. Ingredient's Flavour: Every ingredient have their own taste and smell. For each recipes similar flavoured ingredients are selected.
3. Health association of Ingredients: Each ingredients have different impact on one's health. Few ingredients help in the treatment of illness. Turmeric help in body pain and inflammation.

1. Recipes = Recipe is consists of ingredient and cooking instructions. The

Name any three potential directions for data-driven food innovations.

72 responses

possible data-driven innovations can be
1. Taste/odor prediction:-with having detailed data about the flavor molecules, ingredients flavor profiles, chemical properties about flavor molecules. The taste prediction of the recipe/ingredient is been done with more than 80% accuracy, but odor prediction is still not been conducted with needed accuracy.

2. developing personalized diet plans:- With the change in the lifestyle and food habits of the modern human being, the health of humans are adversely affected and this gives rises to many health issues such as Obesity, type -2 Diabetes, macronutrient deficiencies, cardiovascular diseases, and many more health-related issues. Research has been done to predict the rise in glucose levels in the person after the meal if we had known blood reports, gut microbes, BMI, meals macronutrients. So similar to this project, we can increase our use case to generate personalized meal plans based on the person's medical problems and state.

3. Novel recipes Design:- Cooking is basically how to process ingredients to get food prepared. Developing new recipes is always appreciated in society. So this is exactly what we are trying to do with the food-data we have. In here we make various combinations of ingredients that can go together and also appreciated for their taste.

Visit FlavorDB (http://cosylab.iiitd.edu.in/flavordb/). Pick any ingredient of your choice. List the following details: (a) Name of the ingredient, (b) Ingredient Category, (c) Number of flavor molecules in it, and (d) Name of any one of the flavor molecules.

72 responses

(a) Ketchup
(b) Additive
(c) 5 flavor molecules
(d) Thiamine, betaine are two of its flavor molecules.

Name: Mango
Category: Fruit
No of molecules: 238
Name of one molecule: 1-Dodecanol

1. Cheese
2. Dairy
3. 117
4. 1-Decanol

(a) Name of ingredient - Onion
(b) Ingredient Category - Vegatable
(c) Number of flavor molecules in it - 180
(d) Name of any one of the flavor molecule - Delta-Cadinene