Building the Perfect Personalised Menu!

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About Gousto

You pick from over 50 recipes each week

We deliver a box of fresh ingredients in exact proportions with step-by-step recipe cards

No planning, no supermarkets, no waste!
Building the Perfect Personalised Menu!
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Menu Creation
What’s on the menu?

14/07-21/07
21/07-28/07
28/07-04/08
Menu Size

2016

12

2018

22

30

50

2020+

50+

12

22

30

50

50+
Menu Requirements

**VARIETY**
We want to ensure we offer a wide range of inspiring recipes

**ON BUDGET**
Menu needs to be planned to hit the budget

**OPERATIONS**
Menu needs to comply to several operational constraints

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Manual Process

Manual

Data-driven with manual touches

Data-driven
Data-Driven Menu
**Genetic algorithm**

Evolutionary optimisation method based on natural selection

**INDIVIDUAL**
A member of the population (a menu)

**POPULATION**
Set of N individuals (a set of menus)

**MUTATION**
Change of an element in individual

\[
[\text{Rec 2, Rec 10... Rec 52}] \rightarrow [\text{Rec 2, Rec 12... Rec 52}]
\]

**CROSSOVER**
Combination of two individuals to make a new one

A \[\text{[Rec 2, Rec 10... Rec 52]}\] B \[\text{[Rec 5, Rec 8... Rec 47]}\]

A1 \[\text{[Rec 2, Rec 8... Rec 47]}\] B1 \[\text{[Rec 5, Rec 10... Rec 52]}\]
Genetic algorithm

INDIVIDUAL = [R123, R456, R789…]

POPULATION = [I1, I2, I3….I_N]

MAKE FINAL SELECTION

INITIALISE POPULATION

MUTATE INDIVIDUALS

CROSSOVER INDIVIDUALS

SELECT BEST INDIVIDUALS

EVALUATE INDIVIDUALS

MAKE FINAL SELECTION
DISTRIBUTED EVOLUTIONARY ALGORITHMS IN PYTHON

- Open-source library supporting a range of Evolutionary Algorithms
- Based on a toolbox - define each important function for evaluate, mutate etc.
- Fast to initially set up and start prototyping
- Parallelisation available
Algorithm Objectives

COST PER MEAL

AVERAGE VARIETY
Algorithm Objectives

COMPETING OBJECTIVES

COST PER MEAL

AVERAGE VARIETY

NUMBER OF UNIQUE INGREDIENTS
Results!

- Successfully reduced average cost per menu
- Given Food team time to spend focusing on the important things
- Allowed us to be agile through a very challenging time

We still require manual changes, mainly due to the need of a better definition of menu variety
Personalising the menu
Recommendations

- We use recommendations as a way of helping users navigate the large amount of choice.
- We offer personalised ordering as well as top choices in a personalised collection.
Thank you
Collaborative filtering

K-means clustering
PCA for visualising

Asian flavours
Pescatarian

European flavours
Vegetarian

Speedy
Hybrid approach

- CONTENT BASED APPROACH
- COLLABORATIVE BASED APPROACH
- + BORDA COUNT
- HYBRID ORDERING
- CURATION
- FINAL PERSONALISED ORDER
Results!

- Successfully seen an increase in conversion when applying personalisation
- Customers consistently order from the higher ranks of their menu

We do not have dynamic recommendations or a way for customers to give us feedback on personalisation

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Future
Future

- Tackling **recipe development** process to assess gaps in our library. Filling these should lead to better menus!

- 50 is not the end destination - when there are more recipes, we will need to much **stronger links between** menu creation and recommendations
Learnings

Good discovery sets you up for success

Make sure all involved parts understand and agree on the problem you are trying to solve, even if it takes more talking!

Ensure you think about tomorrow

Make product and architecture decisions that will be as scalable for future needs as possible

Plan for early value release

You often don’t need all the bells and whistles to start delivering value
Thank you