

# Case Study / Technical Task for Decision Science internship at Digital Marketing Analytics team

## Introduction

Welcome to Vinterns 2024 recruitment process for the Decision Science internship at Digital Marketing Analytics team. For this task to complete you will need to have some basic Python or R coding skills required to work with small sample of data, basic ML and statistical knowledge (e.g. working with packages such as Pandas, scikit-learn and similar) also you will have opportunity to demonstrate your reasoning and problem solving skills having a realistic business problem to solve. You will have the opportunity to learn more about what business problems Data/Decision Scientists could face at Vinted. Before we start, let's discuss some ground rules for this assignment:

- This task should take **max. 4/5 hours** to complete.
- The output should be your **code** (share via git or separate file(s)) and a single **pdf file** with answers
  - Please include in your **pdf file** the answers to all of the questions below, possibly including supporting graphs or figures
  - Note that the pdf should be a standalone document
- You should use Python or R language for this assignment and **any tools** for the delivery of the results
- We expect your solutions to be insightful, justified, clearly communicated and understandable by decision makers without a background in statistics.

## Task Overview

## Deliverables

**The output should be your code (share via git or separate file(s)) and a single pdf file with answers sent to [egle.satinskaite@vinted.com](mailto:egle.satinskaite@vinted.com) before 9:00am on 22nd of April.**

- Please include in your **pdf file** the answers to all of the questions below, possibly including supporting graphs or figures
- Note that the pdf should be a standalone document

## Presentation Guidelines

- Format: you can choose **any** form of presentation (e.g., PDF for reports, .py or Jupyter notebook for Python scripts, Jupyter or PPTX for presentations etc.)
- Consultation/Appointment Scheduling (for scheduling 15-30 min. consultation on homework task):
  - [Option 1](#)
  - [Option 2](#)
  - [Option 3](#)

## Evaluation Criteria

- Understanding and application of ML and statistics
- Proficiency in Python or R language
- Creativity and originality in approach
- Completeness and thoroughness of analysis
- Clarity and effectiveness of communication

## Task Description

### Introduction

Vinted is a second hand marketplace where sellers upload items and try to sell them to buyers. It is normal that supply is larger than demand, and not all items are being sold. However, our aim is to make sellers happy. In order to provide sellers with as many opportunities to sell as possible, they can buy specific features to promote their items. One of the available promotion features is the “push up” feature that boosts item visibility.

“Push ups” increase the attention given to a specific item on the platform by increasing the visibility for potential buyers (i.e. more views on the homepage and category page) for 3 days after having purchased the “push up” feature. As a result, the item that is up for sale will get significantly more views (on average). Currently, it costs €2 to buy the “push up” feature. Vinted is considering whether this is the best monetization strategy for the value added services.

Your task is to come up with a data-driven approach to evaluate the existing “push up” monetization strategy and give suggestions on how we could improve the monetization of the platform and its long-term effects.

### Section I: Evaluate current situation

The people at Vinted often introduce new features to the platform. An important step in deciding whether to continue a certain feature is to evaluate the relevant metric(s).

(A) Based on the provided data, what metric can you define to check if users are interested in this feature and why? Calculate this metric. Which categories perform the best according to this metric?

(B) Define a metric that – apart from category – shows a strong correlation with the metric you have found in the previous question. Discuss the relationship between both metrics using a graph.

(C) Explain without additional calculations how the push up feature is performing in your opinion. Is there room for improvement? Why (not)?

(D) In the GIRLS\_CLOTHING / FOR\_BABIES category, the price of the push up feature is more than half of the average listing price. However, there are still sellers willing to pay for the feature. Why do you think this is the case?

## Section II: Analyse alternative strategies

Besides the “push up” feature in its current form, one could think of alternative ways to monetize this feature.

(A) Your colleague suggests setting a fixed price for the “push up” feature different from €2. What implications will a price increase / decrease have on the business, e.g. visibility of listing on the platform?

(B) Another colleague proposes to implement a dynamic pricing strategy, that is, make the feature price relative to the average listing price. Calculate the relative feature price percentage that maximises the push up revenue. Given this percentage, what is the expected revenue and is this an improvement over the current strategy?

We expect analytical depth in your answer here. Please leverage the data that is available to come to a data-driven estimation of the revenue improvement.

(C) What do you think are the uncertainties in your analysis of the dynamic pricing strategy?

## Section III: Next steps

Now that we have run analyses on different strategies, it's time to focus on the implications of the outcomes and associated next steps.

(A) Before fully scaling dynamic pricing of push-ups, what should we do first?

(B) If you had to restrict the original "push up" feature (i.e. fixed 2EUR pricing) to one low-level category on the platform, which one would it be and why?

(C) How would you increase the number of users that are using the "push up" feature?

### Data description

*You may assume all dates are in the same time zone*

Column	Type	Description
category_2	string	High level category available on the platform in which users can list an item
category_3	string	Low level category available on the platform in which users can list an item
number_of_listings	integer	The number of listed items per category
avg_listing_price_eur	numeric	The average price listers ask for their listed items (EUR)
revenue_from_push_ups	numeric	Revenue made by Vinted from the "push up" feature price