

# WorldQuant

## software development challenge

Living in 2021 is living in a world of unexploited data sources. We invite you to create a platform that turns data into a marketable, fun product that lures in users, while generating revenue.

### Introduction to the Challenge

WorldQuant strives to utilize a wide variety of data sources in their market prediction strategies. From daily returns through exchange rate fluctuations to the popularity of a certain brand on social media, we pride ourselves in running the extra miles to turn data into business decisions. Our challenge aims to depict the complexity of business logic and to demonstrate the engineering challenges our colleagues face on a daily basis.

In this challenge your task is to design and implement a betting platform. Given a defined universe of (quantifiable) entities to bet on, the users of the platform should be able to submit binary (increase/decrease) bets on the change of the entities within a specific observation window. Only bets of future events should be allowed.

Examples (without the desire of being exhaustive):

"The USD-HUF exchange rate will **increase** between 2021.05.01. 17:00 and 2021.05.01. 18:00" - the rate observation at the second timestamp will be greater than it is at the first timestamp.

"The number of active players at chess.com will **decrease** between 2021.05.01. 17:00 and 2021.05.01. 17:05" - the active player count at the second timestamp will be less than it is at the first timestamp.

You will be given liberty to design your own bet evaluation system and apply creative solutions in your business model within the limitations of the binary betting detailed above.

Your platform should handle the submissions and reward the successful bets. Your evaluation and reward schema should aim for providing attractive betting opportunities capable of luring in a large amount of users. At the same time, your solution should be cash-flow positive on the provider's side.

As far as the clustering of the various bets and observations windows are concerned, we encourage you to choose the granularity of the observations in a way that reflects the volatility of the underlying products. That being said, we do not restrict your imagination by providing exact requirements; on the contrary, we endorse experimentation with different approaches (keeping in mind the overall time limitation of the Hackathon). Since you are sourcing the data, you are the most appropriate to know these properties.

While we are not expecting fully polished submissions, your solutions should be a working prototype that is capable of receiving bets, evaluating them, and providing feedback on the outcome to the users. Please provide sufficient documentation on how your platform should be utilized. We are also chuffed to hear about your technical and business decisions that made you arrive to your current solution. We value original ideas and technical solutions that get the job done, while staying simple and sustainable.

Below we provide an extensive list of features we find relevant. Aim for picking the ones that best reflect your team's strengths. Feel free to enrich your solution with custom features of your own. Note that we value high quality design and execution over checking many boxes with half-backed solutions.

#### TASK SHOPPING LIST:

- user interface to submit bets and receive feedback on the transaction
- designed bearing the following in mind: fault tolerance, scalability, high availability, diagnostics, monitoring, profiling... anything that helps us handle our next 1 million users of the platform 😊
- painless introduction of new data sources into the system
- pairing bets in a way that allows continuous involvement of users
- ways to analyze past data and bet accordingly
- find a way to host your solution in production

Plus, anything that feeds into the goals of developing this platform.

### Who we are?

WorldQuant is a **quantitative, data & technically driven** quantitative asset management firm — **over 80% of our employees** code on a daily basis. We use computer science, math, and other techniques to seek to produce high-quality predictive signals (alphas) focused on exploiting market inefficiencies. Technologists

at WorldQuant research, design, code, test, and deploy projects while **working collaboratively** with researchers and portfolio managers.

Technologists at WorldQuant research, design, code, test and deploy projects while working collaboratively with researchers and portfolio managers. Our environment is relaxed yet intellectually intense. Our teams are lean and agile, which means rapid prototyping of products with immediate user feedback. We seek people who think in code, aspire to solve undiscovered computer science challenges and are motivated by being around like-minded people. In fact, of the 600 employees globally, approximately 500 of them code on a daily basis.

## What we will provide

A fair amount of the design and implementation details of the challenge is intentionally under-specified to give room to your creative thoughts and solutions. That being said, we will provide live mentoring during the contest to answer your questions and provide further clarification when necessary.

## Judging criteria

### Prototype / Presentation

- We value a nicely constructed demo that captures the key points in your software. Don't be shy about going technical.
- Can we fire up your product and give it a try?
- Are you aware of the prototype's limitations? Revealing them is better than making it crash.
- We value facts and references over opinions.
- Can you provide us a peek under the hood in your presentation?
- An authentic presenter deeply understands their stuff

**The below criteria are thought starters and can be included in the written documentation, but not necessarily part of the 2-minute video pitch.**

### Innovation

Innovation for a product's early life span is like sunlight for blooming flowers. Get your roots right and the rest will sprout.

- Use your original ideas to create the best business model paired alongside the most spot-on technical solutions that serve the goal.
- How does your approach stand out from the crowd? Why does your system differ from the rest of the competitors?

**Impact / Value**

- How would your business model work in a real-world scenario? Is it able to bring money on the table? Tell us about your approach on attracting users and keeping them in the long run.
- Is your product able to generate revenue early?
- Can your solution be developed iteratively?
- Share your ideas on the expansion of the product. What are the key decisions for tech and business?
- Does your software contain a niche tech solution that serves the given purpose best? Show us why you chose this and why it's the best.

**Sustainability**

In 2019 the failure rate for startups is around 90%. Almost 50% of them are dropping in their 5th year.

- Give us some details about how your business model is going to strive past the 5-year mark.
- Early development / tech decisions are key in sustaining a product. What are the calls and practices that make it easy to maintain and develop your software?
- Easily understandable software is easily developable software.
- There are decisions that act as a one-way-street in the software industry. Did you make any? Can you identify any rat-traps in your code? What are your limitations?
- What is your roadmap on maintaining the solution for the first 1 million users? What is your roadmap for the first 10 million?
- Are you going to face any legal issues on your journey?

**Feasibility**

- Show us how your product will withstand the real world.
- What attracts potential users, who is your target group? Are there any unique selling points?
- Tell us more about your plans to fund the idea.
- We are especially interested in the technical details on how you are making your software feasible and scalable in the short and long run.
- Is it easy to involve new personnel in your project?

**Prize**

The winner team of the challenge will get 500 EUR.