**Seazone - Challenge 1 & 2 report.**

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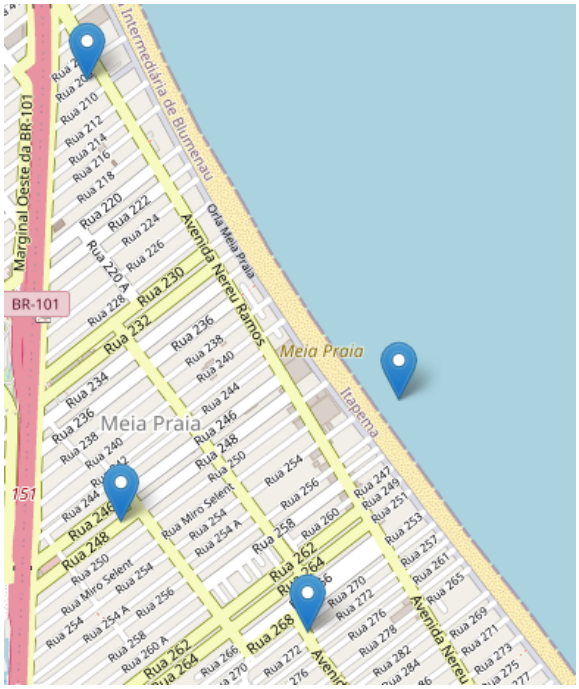
## What is the best property profile to invest in the city?

The best property profile is **42362925**, generating a revenue of **R$153,121.58** in the analyzed data.

## Which is the best location in the city in terms of revenue?

The "Meia Praia" neighborhood, situated close to Meia Praia beach, stands out for its revenue potential.




## What are the characteristics and reasons for the best revenues in the city?

| | | |
|---|---|---|
| Bedrooms | >= 2 | Average of 2,6 |
| Bathrooms | >= 2 | Average of 2,6 |
| Number of Guests | >= 4 | Average of 6,9 |
| Minimum Stay | >= 2 | |
| Price | >= R$749 <= R$2057 | Prices between average and maximum. |
| Start Rating | >= 4.5 | Average of 4.9 in the top 10 |

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## We would like to build a building of 50 apartments in the city, where should we build it and how should the apartments be designed in order to be a great investment?

- We should construct near Meia praia beach.
- The apartments must include a minimum of 2 bedrooms and 2 bathrooms, accommodating at least 4 guests.
- The building should be divided into 50% with 2-bedroom units and another 50% with 3-bedroom units.
- This dual configuration aims to cater to two statistical averages identified among the top 10 locations with the highest revenues.

| 2 bedrooms | 3 bedrooms |
|---|---|
| 1 room suite | 1 room suite |
| 2 bathroom | 2 bathroom |
| ~89m2 | ~140m2 |

## How much will be the return on investment of this building in the years 2024, 2025 and 2026?

Assuming a minimum **75% occupancy rate** for all 50 apartments and an average daily rate of R$1000 per apartment, we could achieve a monthly revenue of R$1,125,000 or an annual revenue of R$13,500,000.

| Year | Revenue | ROI |
|---|---|---|
| 2024 | -R$1.500,000,00 | -10% |
| 2025 | R$12.000,000,00 | 80% |
| 2026 | R$13.500,000,00 | 100% |

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## Technical Observations

**Sources: Python** Statistical Analysis x **MySQL Database** Analysis (Statistical Comparison)

**Improvements**

- Parking statistical information
- Enhanced coverage for holidays and vacant periods in the statistical analysis.
- Improved strategy for the Price dataset utilizing Apache Spark for parallelism. (Source: Python Memory Profiler, Price dataset is excessively large and requires a more robust architecture).

**Process & Memory Usage**

1M batch - ~ 2.8GB/ ~9.0 seconds
100K batch - ~400.00MB / ~1.3 seconds

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## Challenge 2 - Development

1. **How would you structure the architecture and stack of this platform?**

   **Microservices Architecture**: This approach is ideal for building a scalable and maintainable platform with various integrations. Each technology product can be a separate microservice, communicating with the core platform through well-defined APIs. I would also design a microservices-based system following Domain-Driven-Design (DDD) principles. This approach involves breaking down the system into smaller, and focused domains, aligning with the specific business objective to have multiples products/domains.

   **Tech Stack:**

   - Frontend: ReactJS using (Next.js or Remix.js) or VueJS for a dynamic and user-friendly interface.
   - Backend: NodeJS with NestJS framework or Python with Django for robust API development.
   - Database: PostgreSQL or MongoDB for flexible data storage and scalability.
   - API Gateway: AWS API Gateway to manage and secure API access.
   - Containerization: Docker for containerizing microservices, simplifying deployment and scaling.
   - Cloud Platform: AWS, GCP, or Azure for scalability, reliability, and access to various cloud services.
   - Data & Analytics: This is a project that we need a vision for every product, with macro and micro reports for every aspects, and monitoring services, and to collect information for future implementations for new products or services.
   - Artificial Inteligence: Collecting data it's important for future AI-driven products, like chatbot's, recommendations, search etc…

2. **What other product would you use as a benchmark for our product?**

   **Zapier**, for integration with Google Sheets and collect valuable insights into user experience, functionality, and potential challenges in building our product.
   **Slack**, for faster interaction with statistics, feedbacks, monitoring and alerts (notifications).
   **Datadog** for monitoring and reports.
   **Sentry** for bug's monitoring

3. **What will be the main technical challenges in developing this product?**

   - Data Management: Handling, normalizating data from various providers.
   - Security and Compliace.
   - Performance Optimization: Potential latency issues in a multi-vendor enviroment.

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- Reliability and Availability
- API Design and Documentation
- Scalability
- User Experience
- Testing and QA
- Collaboration Challenges (Cross Functional).
- Code base Maintenance
- Cost Management

## 4. How would you structure the development team(s) for this product?

- Dedicated squads for specific products or features.
- Every squad with this configuration 2 front-ends, 2 back-ends, 1 Tech Lead front-end, 1 Tech Lead back-end, for example: Property Management System, and 1 Product Manager and 1 Product Designer.
- Agile methodologies with SCRUM and Kanbam.
- Dedicated DevOps team