



GradeCalc

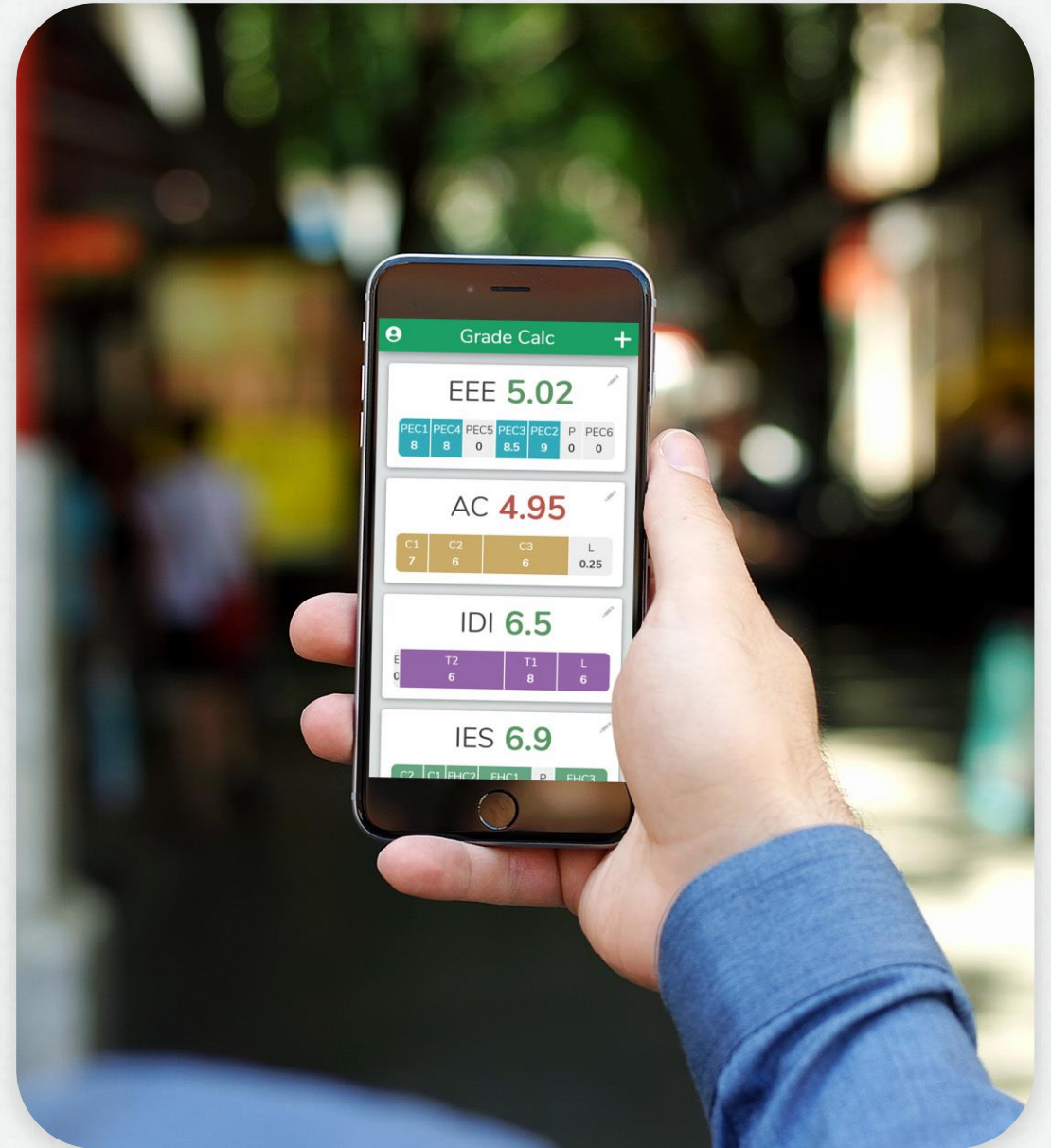
<https://gradecalc.app>

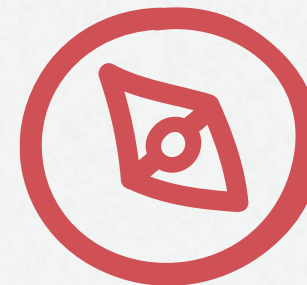
College grades manager and speculator progressive web app

2nd July, 2020

Overview

1. Introduction
2. Specification
3. Implementation
4. Evaluation
5. Conclusions
6. Demo





INTRODUCTION

The problem

State of the art



The problem

- **Students need to know the necessary grade to pass.**
 - Making speculations is complicated.
 - There is no easy method.
 - Students can't organize their study time well.

The benefits of knowing the necessary grade to pass

- **Pass with minimum effort possible.**
- Focus on important assignments.
- Decide what courses need more study time.
- Less stress.

How to calculate the necessary grade?

Find the grade to get in all the remaining exams to make the final grade equal 5

$$\text{Necessary grade} = \frac{5 - \text{Current final grade}}{\text{Sum of weights of undone exams}}$$

Exam	Weight	Grade
Parcial 1	20%	7.1
Parcial 2	20%	5.5
Final	60%	-

$$0.2 \cdot 7.1 + 0.2 \cdot 5.5 + 0.6 \cdot 0 = 2.25$$

$$\frac{5 - 2.25}{0.6} = \mathbf{4.13}$$

$$0.2 \cdot 7.1 + 0.2 \cdot 5.5 + 0.6 \cdot \mathbf{4.13} = 5$$

What do students do?

Save the grades in:



Notes app



Memory



Agenda



Paper



School portal



Spreadsheet

Speculate the necessary grades:



Phone calculator



Calculator



Spreadsheet

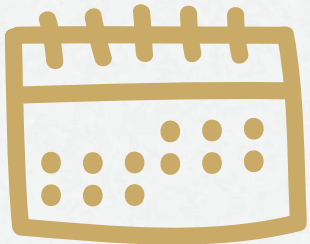
State of the art

- Generic grade calculators
- Atenea - UPC's virtual campus
- Spreadsheet document



SPECIFICATION

Requirements

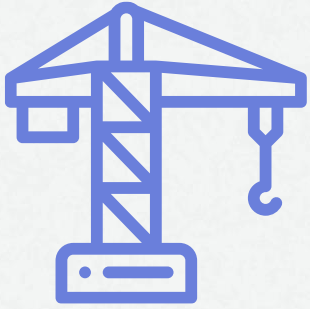


Functional requirements

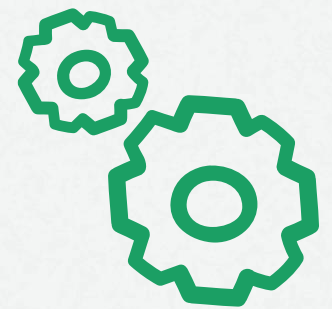
1. Calculate needed grade
2. Calculate final grade
3. See current grades
4. Sign-up
5. Log-in & Log-out
6. Save grades in cloud
7. Save grades in device
8. Create subject
9. Edit subject
10. View subject
11. Delete subject
12. Search subjects
13. Multiple evaluations
14. Dashboard
15. Auto-evaluate
16. Auto-save
17. Auto-sync
18. Responsive UI
19. Use from browser
20. Lunch icon
21. Offline
22. SEO
23. Tutorial
24. Undo
25. Notifications
26. Accessible
27. Updates
28. Analytics
29. Open-source
30. Background activity
31. In Spanish
32. Legal page

Non-functional requirements

- Reliable
- Easy to use
- Engaging
- Cheap to produce



IMPLEMENTATION

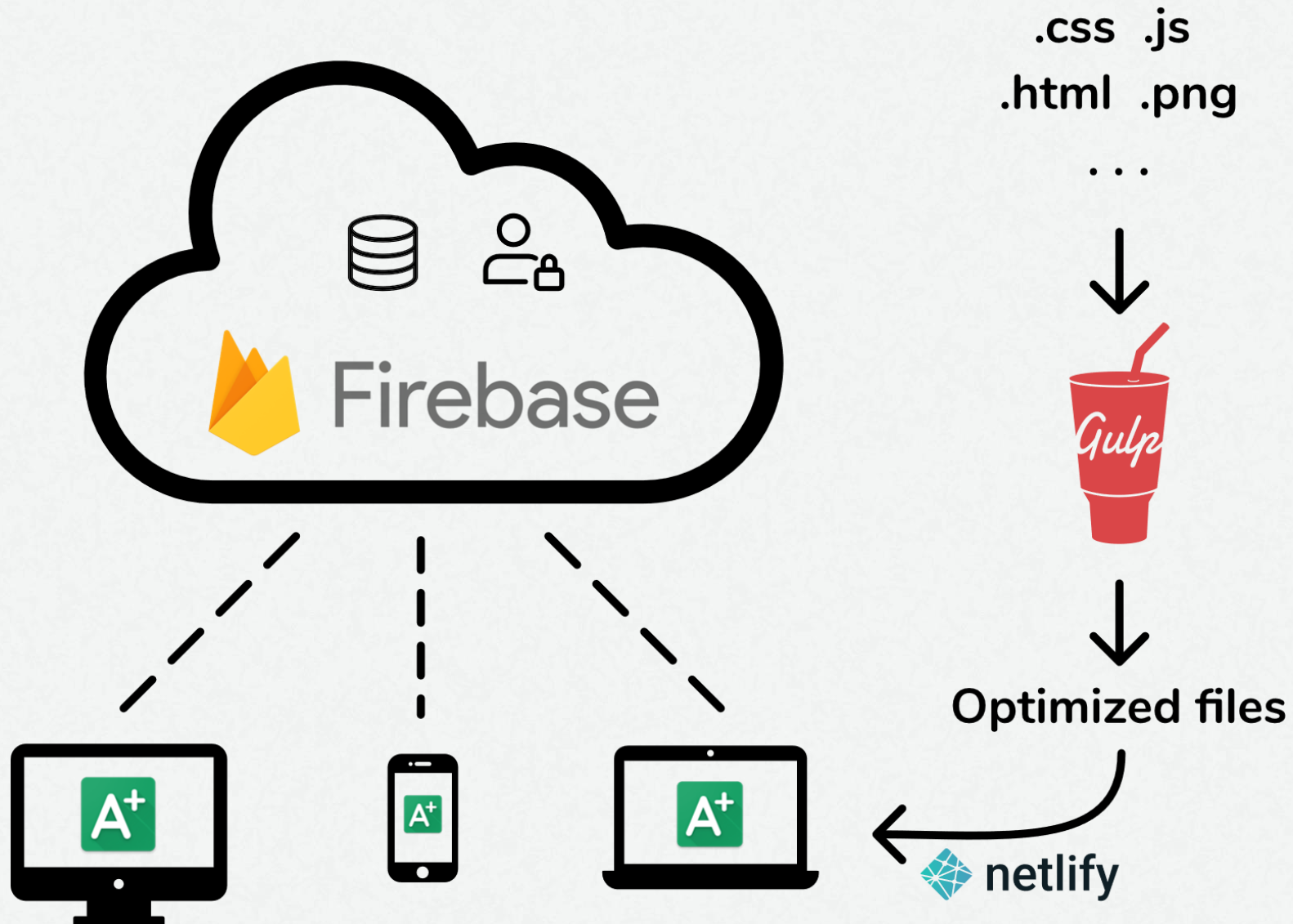


Architecture

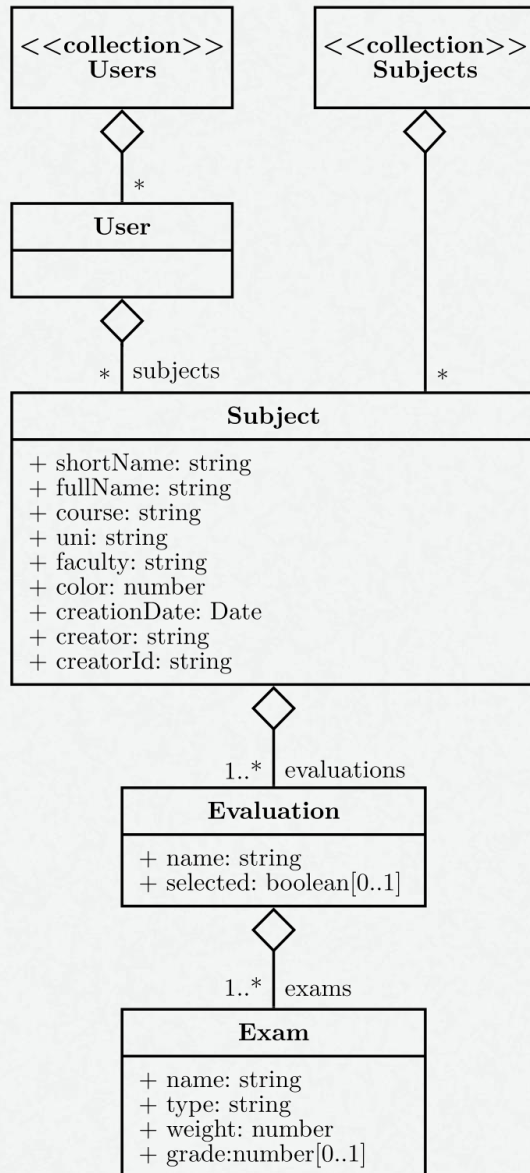
Database

Brand

Architecture



Database

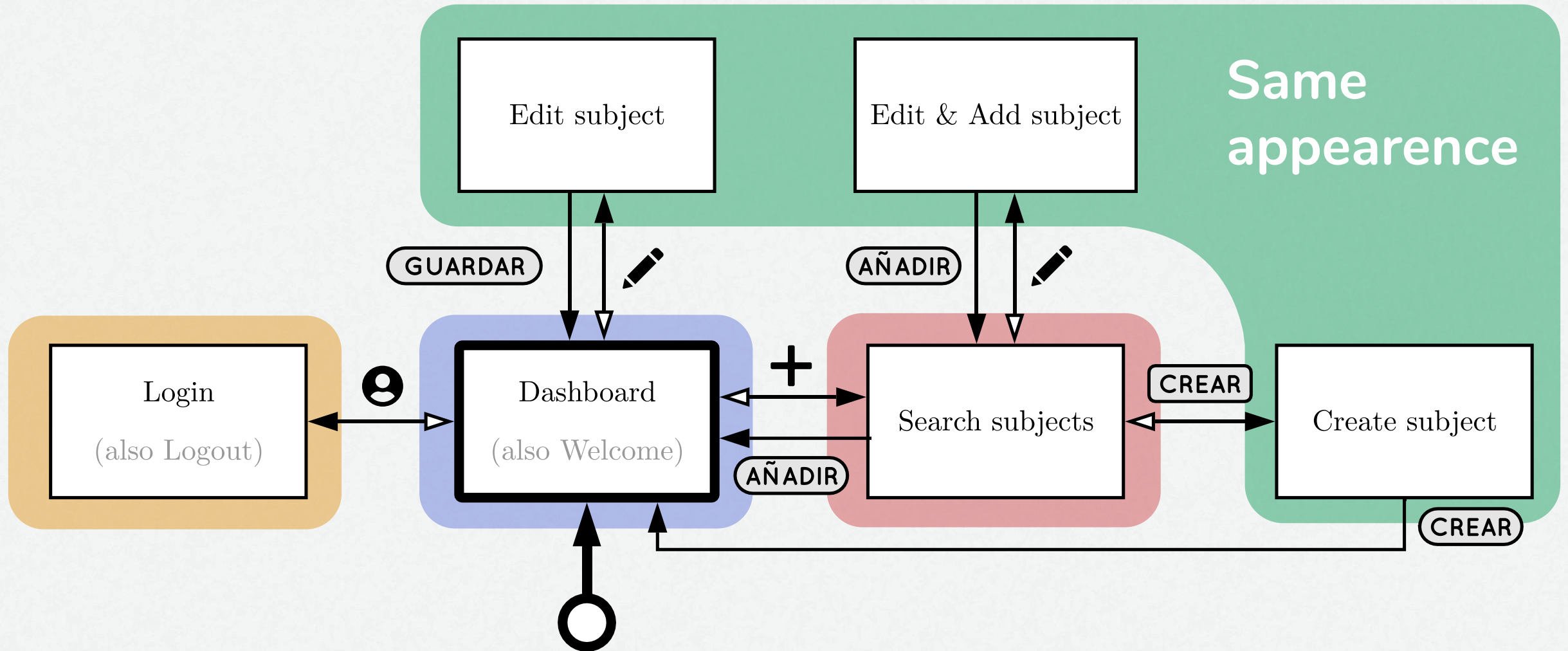


```

{
  shortName: "EDA",
  fullName: "Estructures de Dades i Algorismes",
  course: "Q2 2019-2020",
  uni: "UPC",
  faculty: "FIB",
  color: 2,
  evaluations: [
    {
      name: "Continua",
      exams: [
        { name: "P1", weight: 0.3, type: "Exàmens", grade: 8.33 },
        { name: "PC", weight: 0.3, type: "Exàmens", grade: 5.5 },
        { name: "F", weight: 0.3, type: "Exàmens" },
        { name: "Joc", weight: 0.2, type: "Joc" }
      ]
    }, {
      name: "Final",
      exams: [
        { name: "PC", weight: 0.3, type: "Exàmens", grade: 5.5 },
        { name: "F", weight: 0.6, type: "Exàmens" },
        { name: "Joc", weight: 0.2, type: "Joc" }
      ]
    }
  ],
  creationDate: "February 28, 2020 at 9:39:50 PM UTC+1",
  creator: "Maurici Abad Gutierrez",
  creatorId: "4wUPZqVqt1Y9K6CAWLBNIzwe3b12"
}
  
```

Navigational map

Minimum number of screens



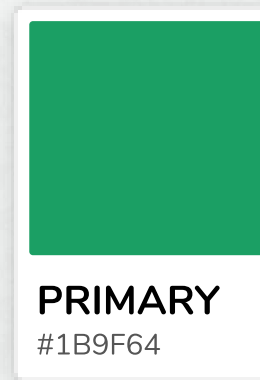
Brand identity

- Logo
- Colors
- Font
- Voice

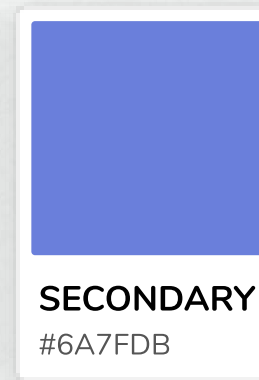
A⁺



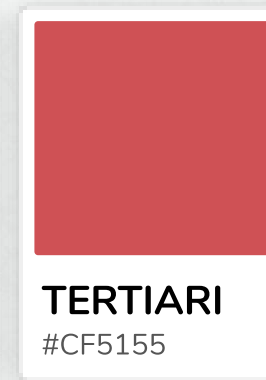
Tetradic
combination



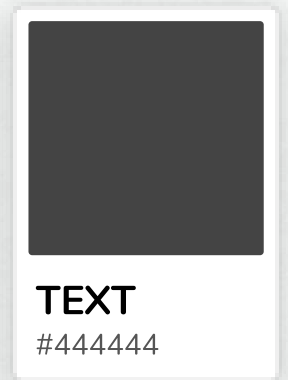
PRIMARY
#1B9F64



SECONDARY
#6A7FDB



TERTIARY
#CF5155



TEXT
#444444

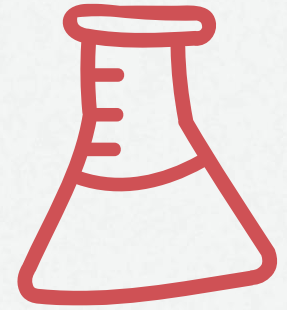


- Friendly
- Practical
- Fresh

Nunito

The quick brown fox
Jumps over the lazy dog.

Nunito Extralight
Nunito Light
Nunito Regular
Nunito Semibold
Nunito Bold
Nunito Extrabold
Nunito Black



EVALUATION



Tests
DevOps
Survey



Tests

Manual tests

End to End tests

- **Account:** Log-in / Log-out / Sign-in
- **Subjects:** Search / Create / Edit / Delete
- Edit grades
- Offline

Automatic tests

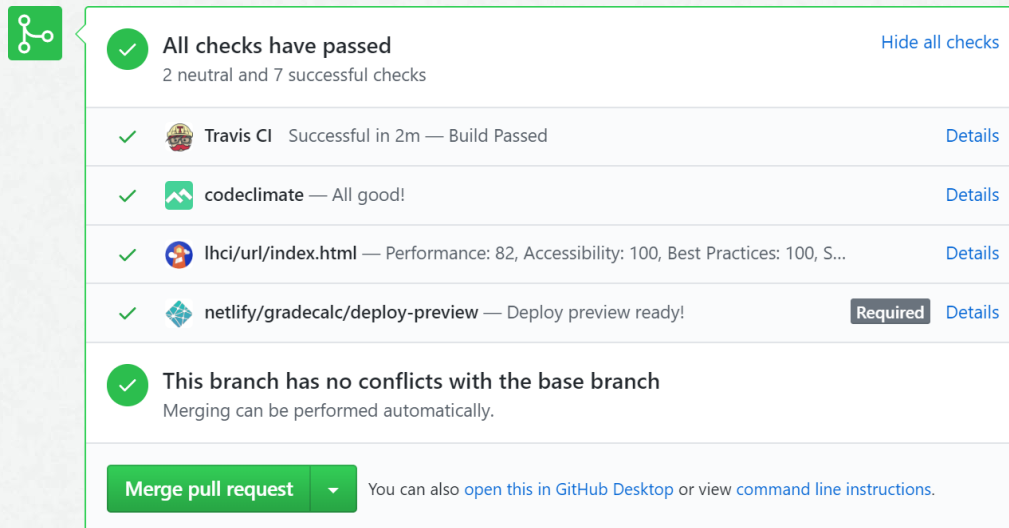
Unitary tests

- Necessary grade
- Final grade

DevOps

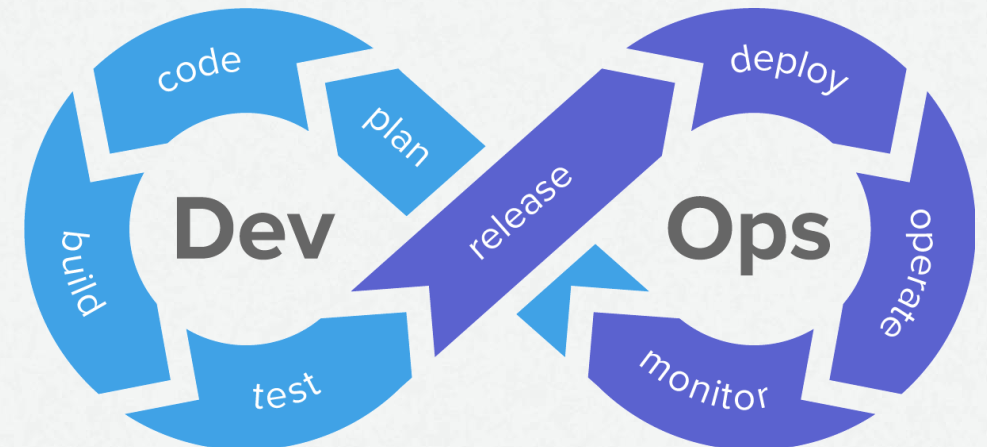
Continuous Integration

- Automatic tests
- Lighthouse audits
- Static code analysis



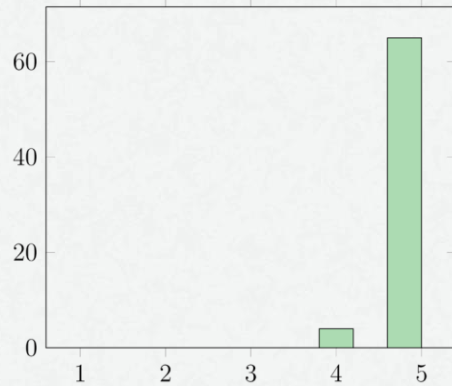
Continuous Deployment

- Deploy previews
- Deploys master automatically

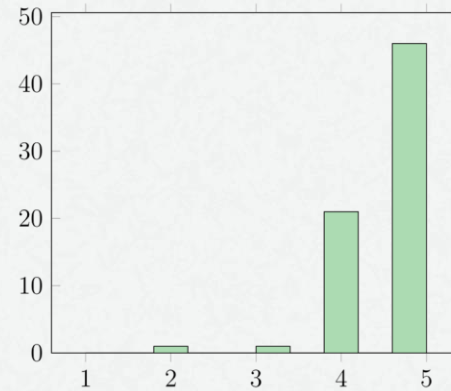


Satisfaction survey

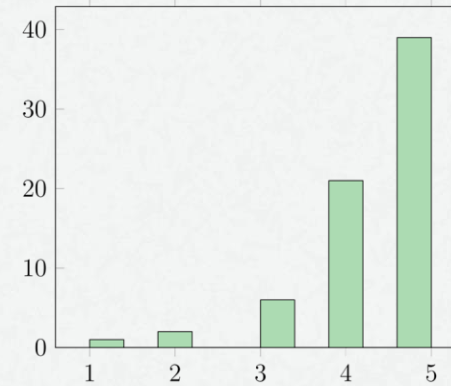
70 participants in 4 days (26.4% of participation)



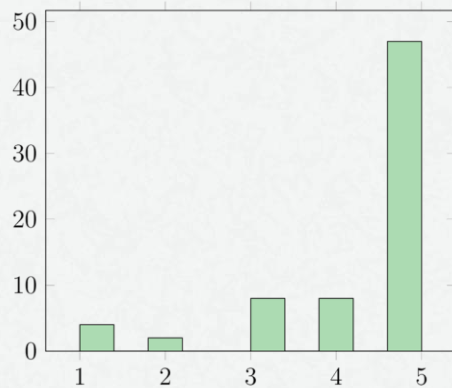
7. La aplicación es fácil de usar.



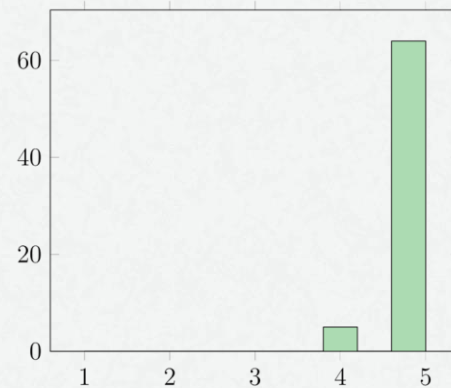
12. Disfruto usando la aplicación.



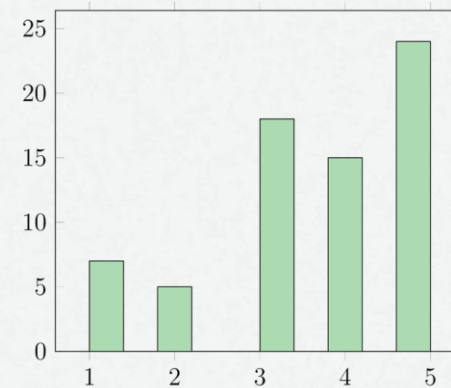
17. Abro la aplicación con frecuencia.



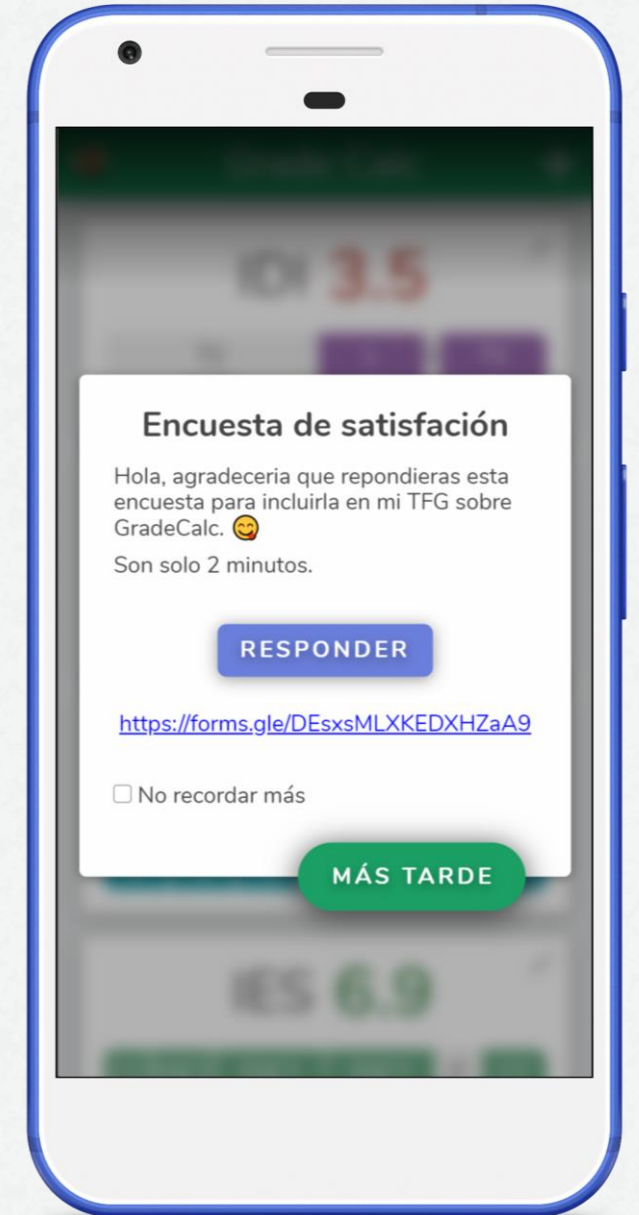
14. Hay personas que usan la aplicación gracias a mí.



13. Recomendaría la aplicación.



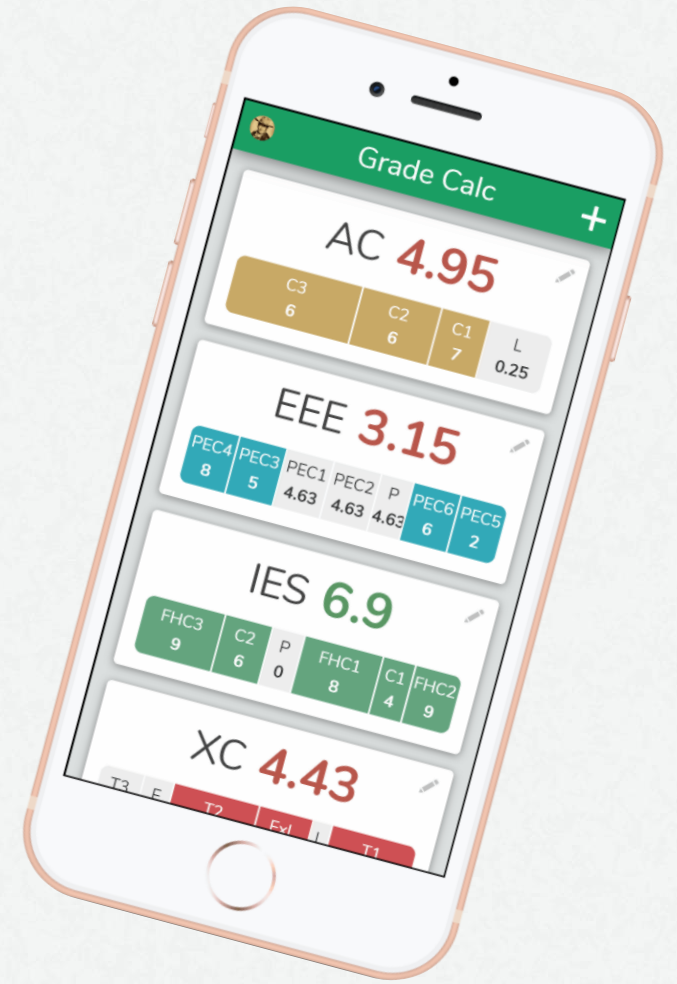
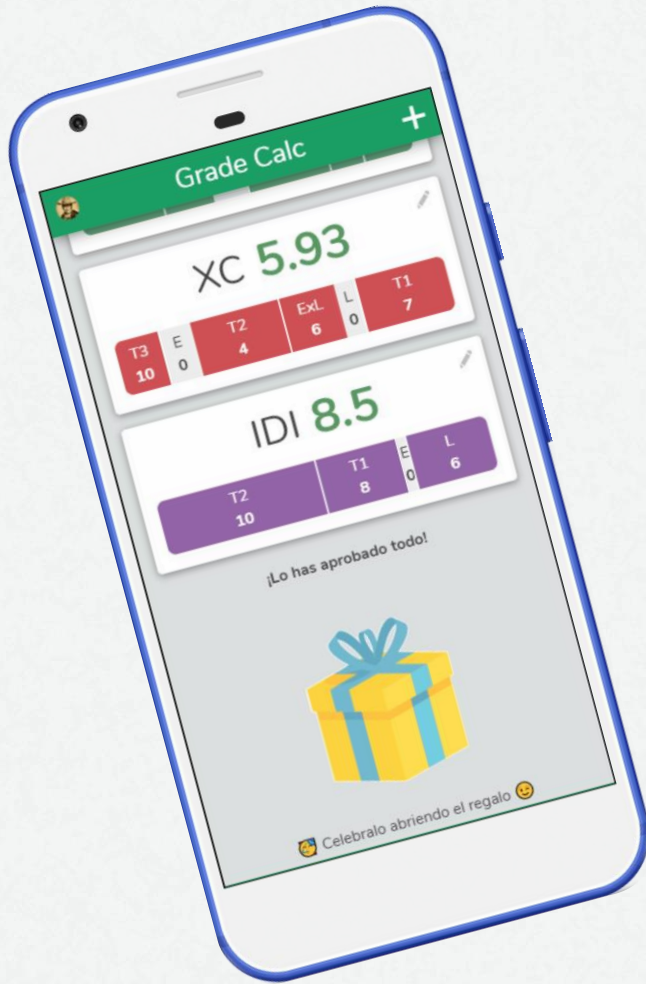
16. La aplicación me ayuda a aprobar las asignaturas.

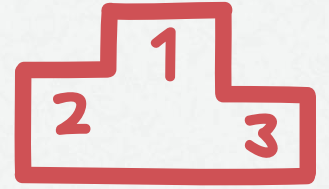




DEMO TIME

<https://gradecalc.app>

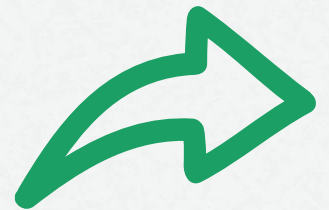




CONCLUSIONS

Future work

Conclusion

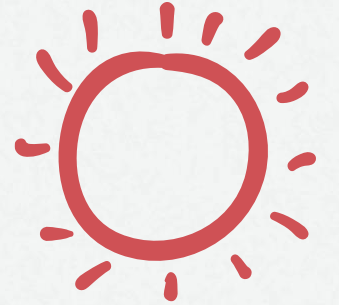


Future work

- Monetize the app.
- Complex evaluation formulas.
- Find a system to avoid duplicate subjects.
- Improve the dashboard.
- Fix all the known bugs.

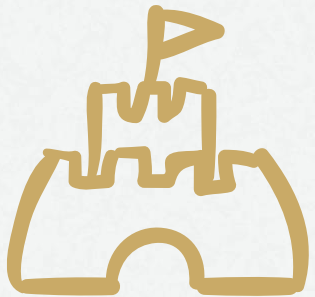
Conclusions

- GradeCalc fulfills the requirements.
- Project objectives achieved successfully.
- I learned a lot.
- The app is published.
- FIB Students use and love the app.



THANK YOU

Have a nice summer!





GradeCalc

<https://gradecalc.app>

College grades manager and speculator progressive web app

2nd July, 2020

APPENDIX

Web performance 1

All Users
100.00% Users

+ Add Segment

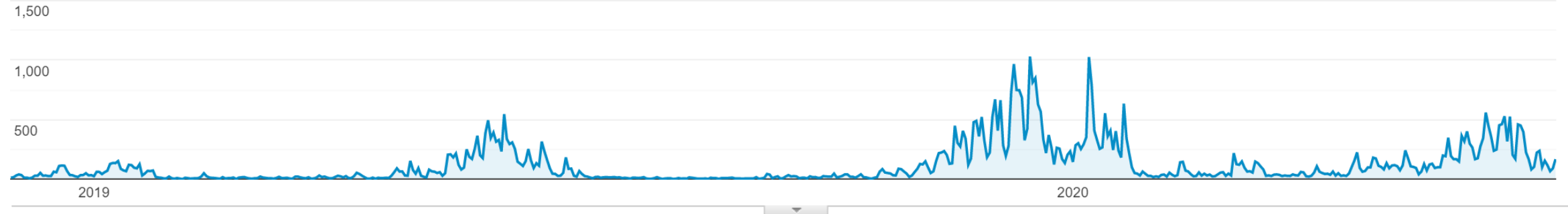
Dec 1, 2018 - Jun 29, 2020 ▾

Overview

Sessions ▾ vs. [Select a metric](#)

Hourly Day Week Month

● Sessions



Users

7,065



New Users

7,108



Sessions

66,023



Number of Sessions per User

9.35



Pageviews

92,711



Pages / Session

1.40



Avg. Session Duration

00:01:44

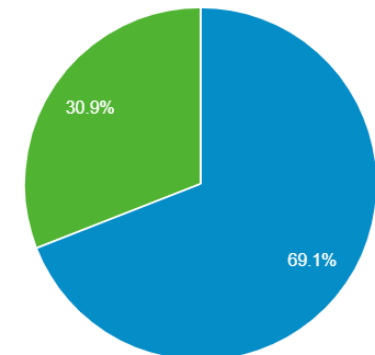


Bounce Rate

79.04%



■ New Visitor ■ Returning Visitor



Web performance 2

 All Users
100.00% Users

 + Add Segment

Dec 1, 2018 - Jun 29, 2020 ▾

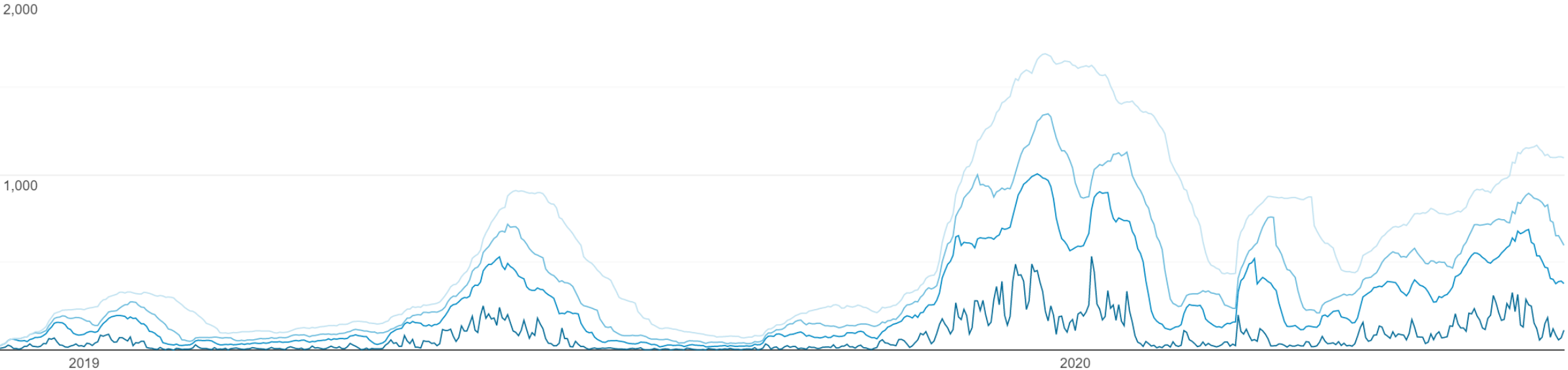
Active Users

☒ 1 Day Active Users

☒ 7 Day Active Users

☒ 14 Day Active Users

☒ 28 Day Active Users



1 Day Active Users

113

% of Total: 100.00% (113)

7 Day Active Users

379

% of Total: 100.00% (379)

14 Day Active Users

597

% of Total: 100.00% (597)

28 Day Active Users

1,095

% of Total: 100.00% (1,095)

Calculate final grade

$$Final = w_1x_1 + w_2x_2 + \cdots + w_nx_n$$

$$Final = \sum_1^{Exams} w_nx_n$$

Example

Exam	Weight	Grade
Parcial 1	20%	7.1
Parcial 2	20%	5.5
Final	60%	-

$$0.2 \cdot 7.1 + 0.2 \cdot 5.5 + 0.6 \cdot 0 = 2.25$$

$$\frac{5 - (0.2 \cdot 7.1 + 0.2 \cdot 5.5)}{(0.6)} = 4.1\bar{3}$$

$$0.2 \cdot 7.1 + 0.2 \cdot 5.5 + 0.6 \cdot 4.1\bar{3} = 5$$

Calculate necessary grade

$$Final = \sum_1^{DoneExams} w_nx_n + \sum_1^{UndoneExams} w_ny_n$$

$$5 = \sum_1^{DoneExams} w_nx_n + \left(\sum_1^{UndoneExams} w_n \right) \cdot y$$

$$5 - \sum_1^{DoneExams} w_nx_n = \left(\sum_1^{UndoneExams} w_n \right) \cdot y$$

$$\frac{5 - \sum_1^{DoneExams} w_nx_n}{\sum_1^{UndoneExams} w_n} = y$$

Total costs

Category	Category cost	Amount	Total cost
Human resources	5460€/month	3months	16380.00€
Hardware	3890€	1	3890.00€
Software	15€/year	5years	75.00€
Other	140€/month	3months	420.00€
Contingencies	586€/month	3months	1758.00€
Unforeseen	3147.75€	1	31477.50€
Total			25670.75€

Calculated expenses

Category	Category cost	Amount	Total cost
Human resources	0€/month	3months	0.00€
Hardware	0€	0	0.00€
Software	15€/year	1years	15.00€
Other	0€	0	0.00€
Contingencies	0€	0	0.00€
Unforeseen	25€	1	25.00€
Total			40.00€

Payed expenses

Detailed expenses

Rol	Weekly hours	Pay	Gross salary	Expense
Project Manager	10h	25€/h	1000€/month	1300€/month
Front-end developer	20h	20€/h	1300€/month	2080€/month
Full-stack developer	20h	20€/h	1300€/month	2080€/month
Total	50h		4200€/month	5460€/month

Table 2.4 Ideal team

Service	Rate	Company	Cost
Co-working space	Mini Flex [38]	SOWO	140€/month + VAT
Total			140€/month + VAT

Table 2.8 Indirect expenses

Item	Model	Amount	Cost	Useful life	Expense
Laptop	Apple MacBook Pro 2019	3	4500€	5 years	75€/month
Mobile	Google Pixel 4 XL	1	760€	3 years	21.11€/month
Mobile	Apple iPhone 11	1	630€	4 years	13.13€/month
Total			3890€		108.24€/month

Table 2.5 Ideal hardware

Category	Cost	Percentage	Contingency
Human resources	5460.00€/month	10%	546.00€/month
Hardware	58.24€/month	10%	5.83€/month
Software	1.25€/month	10%	0.13€/month
Other	140.00€/month	10%	14.00€/month
Total			586€/month

Table 2.9 Contingencies expenses

Service	Plan	Cost
Domain	Domain Renewal	15€/year
Firebase	Spark Plan	Free
Algolia	Community	Free
Jira	Free	Free
Netlify	Starter	Free
Total		1.25€/month

Table 2.7 Software expenses

Event	Event cost	Odds	Cost
Extra month	6295.49€	50%	3147.75€
Total			3147.75€

Table 2.10 Unforeseen expenses



AC 4.95

C3	C2	C1	L
6	6	7	0.25

Teoria 80%

C3:	6	C2:	6	C1:	7
-----	---	-----	---	-----	---

Laboratorio 20%

L:	0.25
----	------

EEE 3.15

PEC4	PEC3	PEC1	PEC2	P	PEC6	PEC5
8	5	4.63	4.63	4.63	6	2

Micro 45%

PEC4:	8	PEC6:	6
-------	---	-------	---

PEC5:	2
-------	---

Macro 45%

PEC3:	5	PEC1:	4.63
-------	---	-------	------

PEC2:	4.63
-------	------

Participación 10%

P:	4.63
----	------

IES 6.9

FHC3	C2	P	FHC1	C1	FHC2
9	6	0	8	4	9

Teoria 65%

FHC3:	9	FHC1:	8
-------	---	-------	---

FHC2:	9
-------	---

Lab 35%

C2:	6	P:	0	C1:	4
-----	---	----	---	-----	---

XC 4.43

T3	E	T2	ExL	L	T1
1.84	1.84	4	6	1.8	7

IDI 3.5

T2	T1	E	L
2.86	8	2	6