Imade

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Human Computer Interaction & Affective Computing

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1. Imade

Buying from a small business is a great way to support someone's dream and livelihood, as well as the local economy. Since 2020 there's been a growth in the number of small businesses online (Apple, 2020), yet why is it so difficult to search them online? After performing a market research on different platforms where small businesses can sell their goods, there doesn't seem to exist one, unified platform in which a potential buyer can easily find all local businesses.

Platform	Pros	Cons
Instagram	- a lot of small businesses in one place - huge community	- Searching by tags or location, but not both at the same time - The "algorithm" chooses what to show you - i.e. the most followed and the most advertised posts and accounts are the first to be shown - Can't directly buy from Instagram - You're redirected to the business' website or you have to send them a private message - *Instagram Shop* shows only products from accounts you already follow

Facebook	- huge community
	- many Facebook groups for local areas where you can buy/sell goods
	- Facebook Marketplace - buy/sell goods based on your location
		- *Local Facebook groups*
		  - if private: Don't appear in search results if you don't have a Facebook friend who's already joined; You have to be invited/approved to join
		  - if public: Sellers could often be scammers
		- *Facebook Marketplace*
		  - limited categories of what you can buy/sell
		  - The "algorithm" chooses what to show you - i.e. what you last searched will appear the most

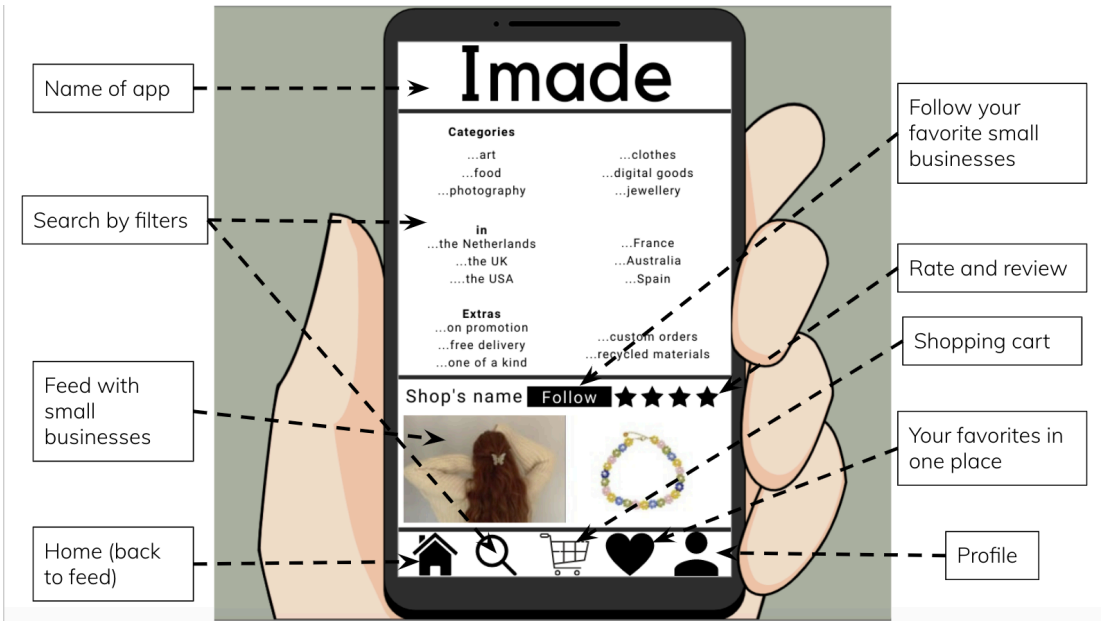
Arts & Crafts platforms	- a lot of such platforms: Etsy, eBay, Amazon Handmade, Aftcra, Shopify, Goimagine, ArtFire, indieCart, Madeit, etc. - Search through filters - Can directly purchase from these websites - Rate and review businesses and products	- limited categories of what you can sell: Jewellery, Clothing, Digital goods (printables, art, photos), Art, Stationery supplies, Candles, Soaps, Everything made from clay/polymer clay
Food platforms	- a lot of such platforms: UberEats, Foodpanda, Deliveroo, DoorDash, Etc. - Search through filters - Can directly purchase from these websites - Rate and review businesses and products	- Most small business are usually not on them as they don't have the capacity to make food in big quantities for a day - Such platforms don't allow for custom orders - something that small businesses offer
No platform found	- So many different small businesse: Photographers, Organizing picnics, Painting portraits during an event, Renting big letters of the alphabet for events, etc. - Custom orders	- They don't fit the requirements for the above platforms to be able to sell on them

Table 1: A summary of my market research, highlighting the pros and cons of different platforms where small businesses can sell their goods.

I decided to create an app, in which the customer can easily search different small business through filters, follow their favourite shops, rate and review them and their products, and directly purchase from the app. My app *Imade* incorporates all the pros of other platforms and allows for all kinds of small businesses to be found.

Picture 1: A storyboard (a low fidelity prototyping technique) of how my app *Imade* came to be.

Since I want my app to be used by all people, I wanted to see how easy *Imade* would be to use by testing learnability. Instagram seems to be the most popular choice for small businesses as it doesn't have restricting categories and has the most users. Hence, I used Instagram's layout as a blueprint to my app, then improved it by adding Filter, Rate & Review, Shop and Favorites (see picture 2). My hypothesis is that people who spend more time on Instagram will complete the tasks faster as there is a **familiarity and consistency** (principles of **learnability**) between *Imade* and Instagram.



Picture 2: *Imade*'s interface layout with explanation of what each button does.

For user testing I made 3 tasks:

1. **Task 1:** Sign in into the app (No need to write username and password!). Follow the small businesses CatMadeCrafts, FantasyLandDesigns, and NinaEightyThree in this order. Then check if they have been added to your Favorites tab.
2. **Task 2:** Find the small business Paola Art Cake and purchase one Unicorn cake. (Hint: Use the filters)
3. **Task 3:** You have changed your mind about the Unicorn cake. Go to My Orders and cancel your order.

Link to prototype: https://xd.adobe.com/view/55f73c7a-448b-46bd-9f75-bbdb58868db2-00a4/?fullscreen&hints=off (See Appendix A for instructions on how to test my prototype.)

Here's how to perform all tasks (see picture 3 for screens):

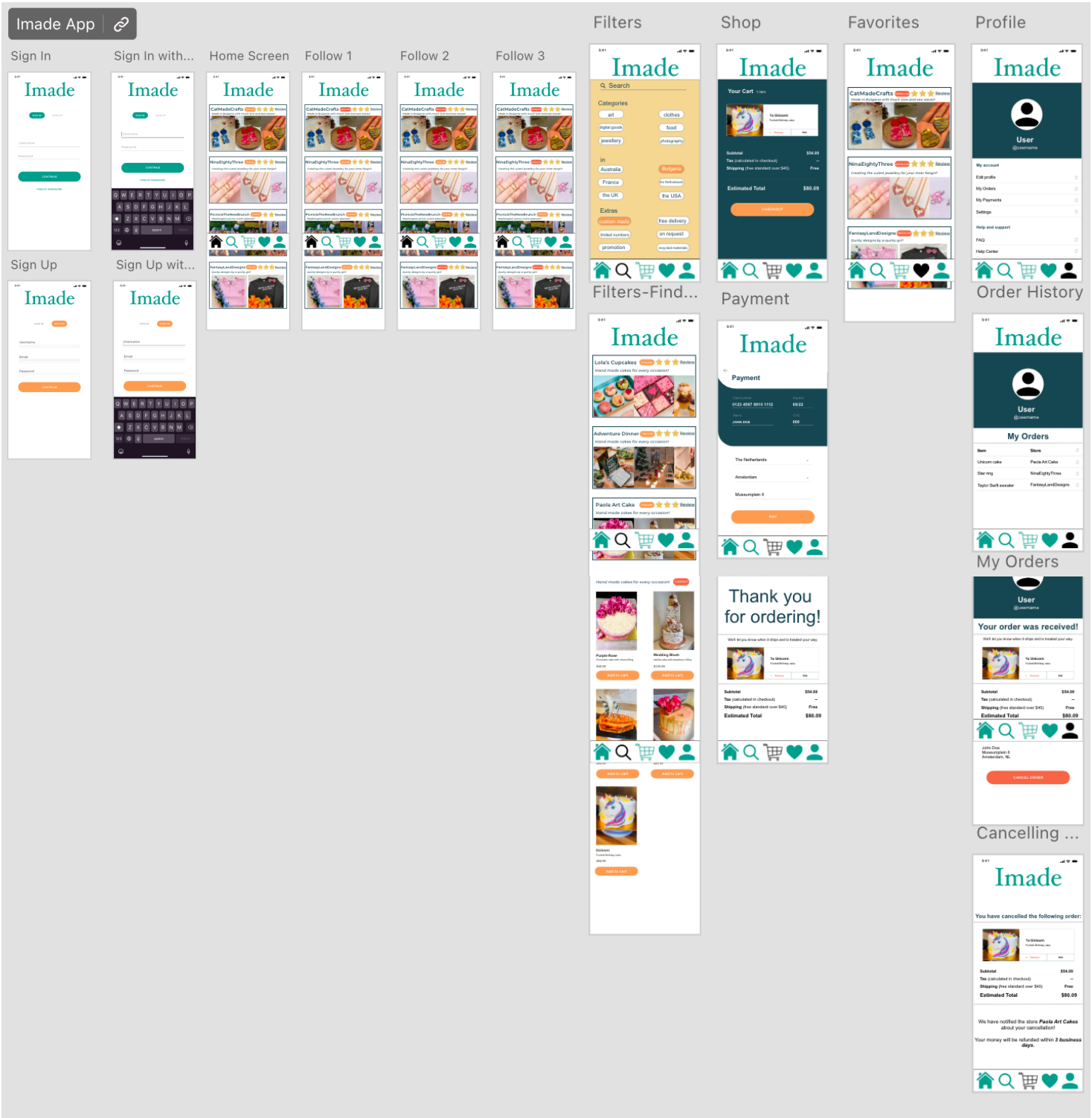
1. **Task 1:** You start at Sign In (Sign Up screen is also clickable) => Click on Continue => You're at Sign In/Sign Up with Keyboard => Click on Continue => You're at Home Screen => Follow the small businesses CatMadeCrafts, FantasyLandDesigns, and NinaEightyThree **in this specific order** (by clicking the orange Follow button next to their names). Only then Favorites (the heart icon) will be available to be clicked. => Click on Favorites
2. **Task 2:** Click on Filters (the magnifying glass icon) => Click on "food" => Find the small business Paola Art Cake and click on it => Find the Unicorn cake and click "Add to cart" => You're redirected to Shop => Click on "Checkout" => You're redirected to Payment => Click on "Pay" => Your order was confirmed
3. **Task 3:** Click on Profile => Click on "My Orders" => Click on "Unicorn cake" or "Paola Art Cake" => Click on "Cancel Order" => Your order was cancelled.

With these tasks I'm testing:

- **Easiness to use:** Does the app seem familiar to them? Is it predictable?
- **Efficiency:** How fast did the user complete the task?
- **User satisfaction:** Can they understand the task and the app? Where's the user on the Theory of flow model?

Due to my hypothesis, I tested one version of my prototype and split my users into two groups: Group A spends more than 2 hours on Instagram; Group B spends 2 or less hours on Instagram (see Appendix B). Thus, I used unpaired two-sample t-test with H_0: $\mu_A=\mu_B$ and H_1: $\mu_A\neq\mu_B$ to analyse the data I've collected (See Table 2). My predictions were the following:

1. Group A will perform the tasks overall faster than Group B
2. Group A will be on the "Control" part of the Theory of flow mode, as their abilities will be high and they will find the tasks moderately challenging.



Picture 3: All screens of my prototype. Each screen has clickable buttons needed to perform the 3 tasks.

2. Discussion and Conclusions

As expected, Group A performed the tasks faster than Group B. Further, H_0 is accepted since abs(t)=1.61 is lower than 2,18 (the critical value for α=0.05 and df=12):

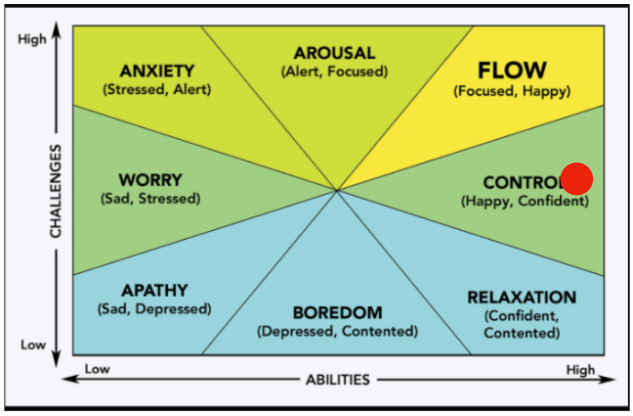
Group	Sample size (n)	Average (X-bar) of Total time of the 3 tasks combined (in seconds)	Standard deviation (s)
Group A	6	75,45	36,48
Group B	8	141,79	94,70
Alpha level (α)	0,05		
Degrees of freedom (df)	12		
Critical value for given α and df	2,18		
Difference between the population means for the two groups:		66,34	
Pooled variance (s_p^2)	5785,88183333333		
Pooled standard deviation	76,064984278795		
Standard error of difference	41,0797866116117		
Test statistic (t)	1,61490614903166		
Critical region	Accept H_0 since abs(t)=1.61 is lower than 2,18 (which is the critical value for α=0.05 and df=12)		

Table 2: Two-sample t-test

As predicted, Group A is on the “Control" part of the Theory of flow mode. They found all tasks to be easy and felt confident that they could successfully finish them (see Diagram 1 and Table 3). On the other hand, Group B had mixed feelings for every task. Here users fall on the “Control" part, but also on the “Anxiety" part. This could be due to some biases I didn't account for:

- Sampling bias: I didn’t ask for the users’ age as my app aims to be used by all people. However, younger people tend to be more digitally versed.
- Experimenter bias: The difficulty level of tasks could be more difficult/easier for different users than I planned.
- Subject bias: I’m accounting only for time spent on Instagram. However, if users spend more time on another social media platform, they still could perform well. Thus, I also asked all users how much time they spend a day on other social media platforms, but I didn’t include this data in my thesis nor t-test. Users 2, 6, and 13 spend less than 1 hour a day on other social media, which is the least amount of time compared from the rest of the users in this group. Hence, it’s expected that they’ll find the tasks more challenging and will need more time to perform them.

Overall, after performing each task, Group B became more familiar with the interface (see Diagram 1 and Table 4).



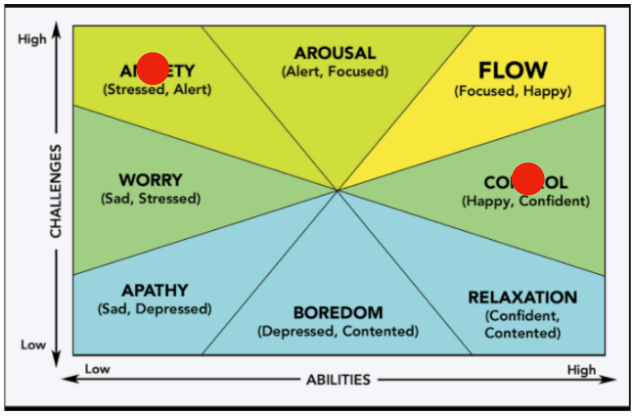


Diagram 1: Group A (left). Group B (right). The red dot indicates where the users are on the Theory of flow model based on their abilities (i.e. time spent on Instagram) and how challenging they found the tasks to be.

Users	Difficulty of Task 1 (1-Too Complicated; 5-Super easy!)	Emotions from Task 1 (1-Stressed; 5-Confident)	Difficulty of Task 2 (1-Too Complicated; 5-Super easy!)	Emotions from Task 1 (1-Stressed; 5-Confident)	Difficulty of Task 2 (1-Too Complicated; 5-Super easy!)	Emotions from Task 3 (1-Stressed; 5-Confident)	Difficulty using my app (1-Too Difficult; 5-Very Easy To Use)	Overall familiarity (1-Unfamiliar ; 5-Felt Like The Others)
1	4	4	4	4	5	5	5	5
4	4	4	5	5	5	5	5	3
5	5	5	5	5	5	5	5	5
11	5	5	5	5	5	5	5	4
12	5	5	5	5	5	5	5	5
14	5	5	5	5	4	5	5	4

Table 3: Group A's reported difficulty of each task and their experienced level of emotions while performing said task.

Users	Difficulty of Task 1 (1-Too Complicated; 5-Super easy!)	Emotions from Task 1 (1-Stressed; 5-Confident)	Difficulty of Task 2 (1-Too Complicated; 5-Super easy!)	Emotions from Task 2 (1-Stressed; 5-Confident)	Difficulty of Task 3 (1-Too Complicated; 5-Super easy!)	Emotions from Task 3 (1-Stressed; 5-Confident)	Difficulty using my app (1-Too Difficult; 5-Very Easy To Use)	Overall familiarity (1-Unfamiliar ; 5-Felt Like The Others)
2	4	4	4	4	3	3	3	1
3	4	4	5	5	5	5	5	5
6	1	2	5	5	5	5	4	3
7	4	4	3	3	4	4	3	4
8	5	5	5	5	5	5	5	5
9	5	5	5	5	5	5	5	5
10	4	4	4	5	4	4	4	3
13	1	3	1	4	4	4	5	5

Table 4: Group B's reported difficulty of each task and their experienced level of emotions while performing said task.

From this sample, I can derive that on a population level, users, who don't use social media a lot on a daily basis, might need more time or even additional help to navigate and use my app until they become familiar with it. Overall, all users who tested my app seem to enjoy using it. However, since my sample is small (N=14), it can't be said much about the population with certainty, but I'm optimistic that the population will follow the trend of my sample and will enjoy using my app in the future.

Word count: 1498

3. Works Cited

Apple. (November 18, 2020). *Apple announces App Store Small Business Program* [Press Release]. https://www.apple.com/newsroom/2020/11/apple-announces-app-store-small-business-program/

Adobe XD Kits: Signup Screen UI kit and Social Meet Up UI kit

4. Appendix A: My prototype

Link to test my prototype: https://xd.adobe.com/view/55f73c7a-448b-46bd-9f75-bbdb58868db2-00a4/?fullscreen&hints=off

To test my prototype, open the link on any browser and start clicking on the buttons. To enter the app, you don't need to actually sign up or sign in as this is just a prototype. Thus, click on "Continue" until you are redirected to the Home Screen.

Some of the buttons work only in a specific order due to how I set up the hard coded tasks for the user testing. That's why, to test all functionalities of my prototype, I suggest following the 3 tasks in the user testing. Here are some additional instructions you can test:

- You start at Sign In (Sign Up screen is also clickable) => Click on Continue => You're at Sign In/Sign Up with Keyboard => Click on Continue => You're at Home Screen
- You're at Home Screen => You can click on Filters and Profile
- To access the Favorites (the heart icon), follow **Task 1**
- To test the Filters and make a purchase, follow **Task 2**
- To test the Profile and cancel your order, follow **Task 3**

Attention: If you click on "Cancel Order", you won't be able to click on anything else anymore, as this is the end of the testing.

5. Appendix B: User testing

Link to do the user testing on Useberry: https://app.useberry.com/t/kZjthDXcXb5z/

Group A: User spends more than 2 hours on Instagram

Users	Task 1 (time in seconds)	Task 2 (time in seconds)	Task 3 (time in seconds)	Total time of the 3 tasks combined (in seconds)	Time spent on Instagram a day	Time spent on other social media a day	Difficulty using my app (1-Too Difficult; 5-Very Easy To Use)	Overall familiarity (1-Unfamiliar ; 5-Felt Like The Others)
1	20,9	29,2	10,7	60,8	3-4h	3-4h	5	5
4	50,1	57,5	9,4	117	3-4h	Less than 1h	5	3
5	21,9	22,5	14,1	58,5	3-4h	Less than 1h	5	5
11	22,0	19,6	15,4	57	5-6h	Less than 1h	5	4
12	44	35,3	16,2	95,5	3-4h	Less than 1h	5	5
14	21,6	26,1	16,2	63,9	5-6h	1-2h	5	4
Mean	30,08	31,70	13,67	75,45				
Median	21,95	27,65	14,75	62,35				
Mode	⚠	⚠	16,2	⚠				
Standard Deviation (STD)	16,63	17,36	5,82	36,48				
Variance	327,645666666667	361,451	35,9306666666667	1596,58				

Group B: User spends 2 or less hours on Instagram

Users	Task 1 (time in seconds)	Task 2 (time in seconds)	Task 3 (time in seconds)	Total time of the 3 tasks combined (in seconds)	Time spent on Instagram a day	Time spent on other social media a day	Difficulty using my app (1-Too Difficult; 5-Very Easy To Use)	Overall familiarity (1-Unfamiliar ; 5-Felt Like The Others)
2	18,3	64,8	41,3	124,4	1-2h	Less than 1h	3	1
3	19,5	23,5	21,8	64,8	1-2h	1-2h	5	5
6	113	72,8	42,6	228,4	None. I don't use Instagram.	Less than 1h	4	3
7	86,3	87,2	28,8	202,3	None. I don't use Instagram.	1-2h	3	4
8	26,4	52,6	15,4	94,4	Less than 1h	1-2h	5	5
9	14,1	32,1	14,5	60,7	Less than 1h	6+h	5	5
10	27,7	23,6	17,0	68,3	1-2h	1-2h	4	3
13	123,9	99,5	67,6	291	Less than 1h	Less than 1h	5	5
Mean	53,65	57,01	31,13	141,79				
Median	27,05	58,70	25,30	109,40				
Mode	⚠️	⚠️	⚠️	⚠️				
Standard Deviation (STD)	46,74	33,16	20,13	94,70				
Variance	1563,41125	873,379285714286	206,899285714286	5876,08982142857				