Conceptualizing Online Support Networks

For Neurodevelopmental Disorders

Alison Huang, Sia Huang, Lauren Sims

Recap

Analyzing r/ADHD subreddit, a peer-support forum for people with ADHD.

How does the structure of this community and conversation trends reflect support group dynamics and varied perceptions of ADHD?

Finding 1

The network structure has several key opinion leaders with high degree centrality and high betweenness centrality

Finding 2

Submissions and especially comments are skewed toward positive sentiment

Hypotheses

H1 The subreddit will show distinct subgroups

H2 Submissions and comments will differ in terms of subjectivity

H3 Prominent topics will be work, sleep, and medication

H4 Users within the same submission will share similar sentiments

A. D. Kramer, J. E. Guillory, and J. T. Hancock. Experimental evidence of massive-scale emotional contagion through social networks. Proceedings of the National Academy of Sciences, page 201320040, 2014.

A. Park, M. Conway, and A. T. Chen. Examining thematic similarity, difference, and membership in three online mental health communities from reddit: A text mining and visualization approach. Computers in human behavior, vol. 78, pp. 98–112, 2018.

I. Himelboim, X. Xiao, D. K. L. Lee, M. Y. Wang, and P. Borah. A Social Networks Approach to Understanding Vaccine Conversations on Twitter: Network Clusters, Sentiment, and Certainty in HPV Social Networks. Health communication, vol. 35, no. 5, pp. 607–615, 2020.

J. Tang, G. Yu, and X. Yao. Emotional contagion in the online depression community. Healthcare (Basel), vol. 9, no. 12, pp. 1609-, 2021.

M. Yoo, S. Lee, and T. Ha. Semantic network analysis for understanding user experiences of bipolar and depressive disorders on Reddit. Information processing & management, vol. 56, no. 4, pp. 1565–1575, 2019.

Dataset

2023-10-10 to 2023-10-16

Submissions: 993 x 13
Comments: 10486 x 13

.....

2023-10-10 to 2023-11-15

Submissions: 3064 x 13
Comments: 43764 x 13

More than 3x submissions and more than 4x comments

Network Analysis

Constructing the Network

Network Metrics and Analysis

Visualization of the Communities

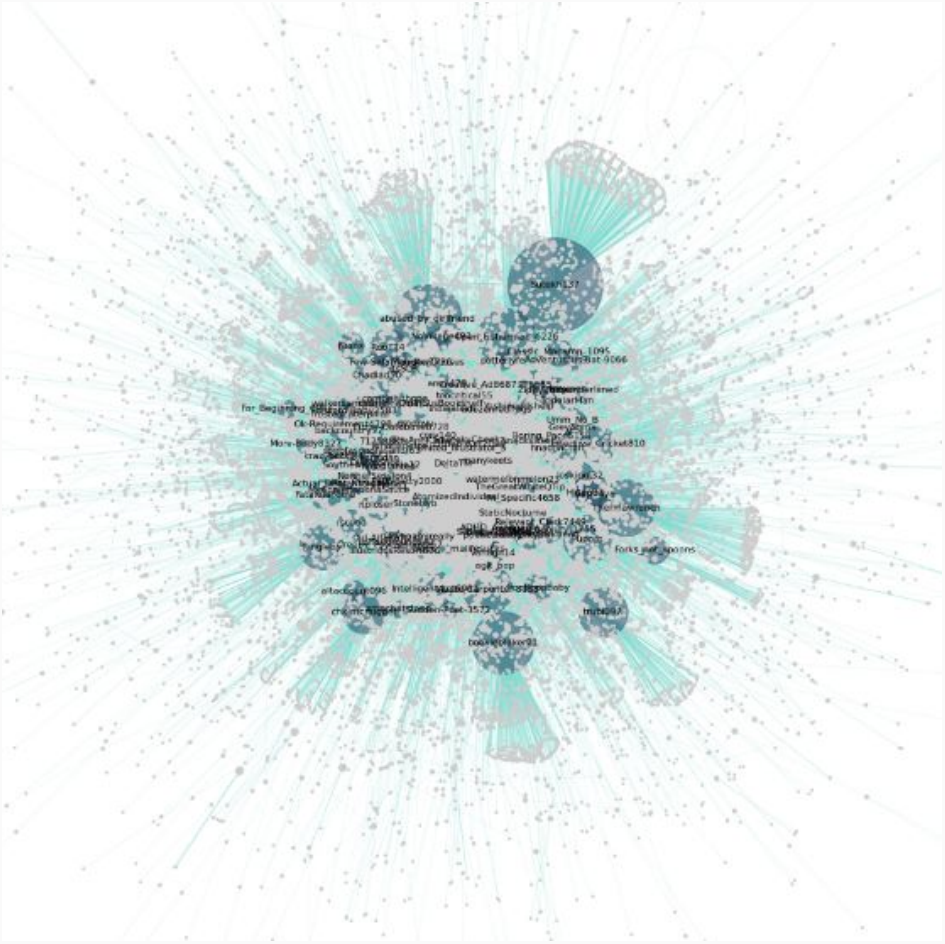
Potential Discussions

H1 The subreddit will show distinct subgroups

Constructing the Network

Number of nodes (users): 18,096

Number of edges (interactions): 32,045



Network Metrics and Analysis

Network density

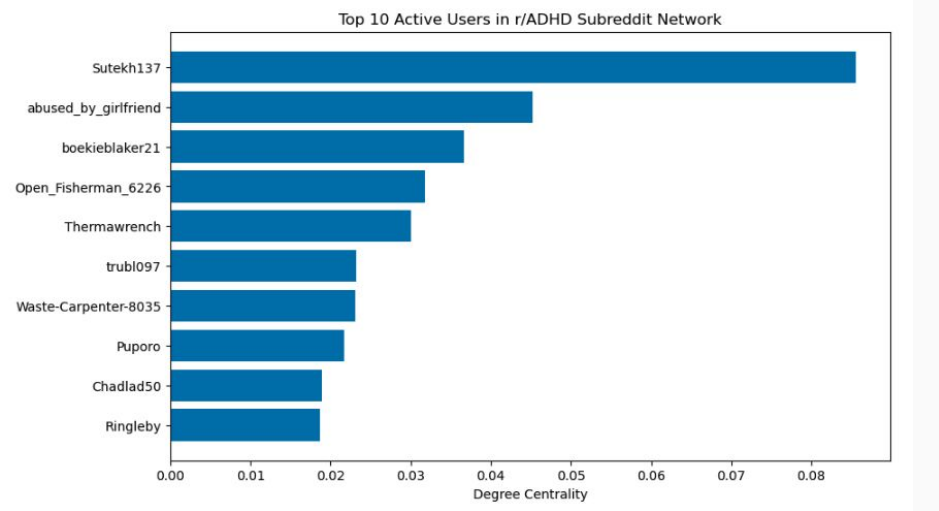
Degree distribution

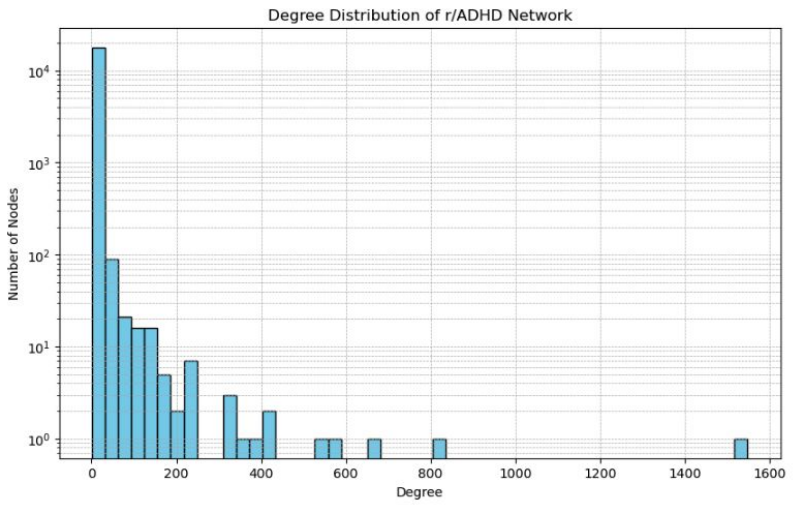
Centrality measures : degree centrality

Network components : number and size of connected components

```
# Calculate network density
network_density = nx.density(G)

network_density
```

```
9.786312977802339e-05
```





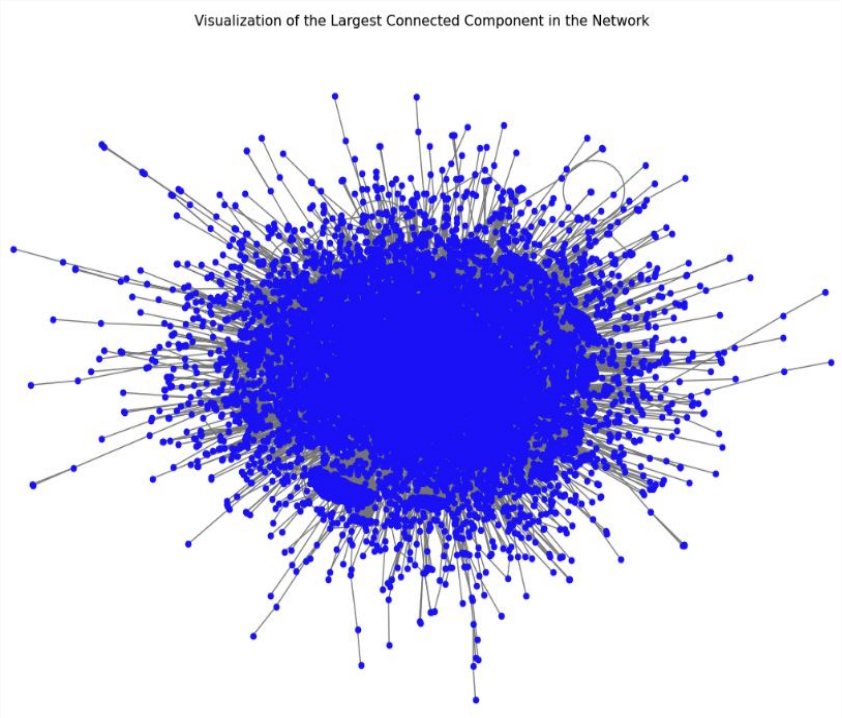
Network Components

Number of Connect Components (user interactions): 221
221 groups of users who are all connected through a series of replies or interactions

Size of Largest Component: 17,605
the number of nodes (users) in the largest connected group in the network

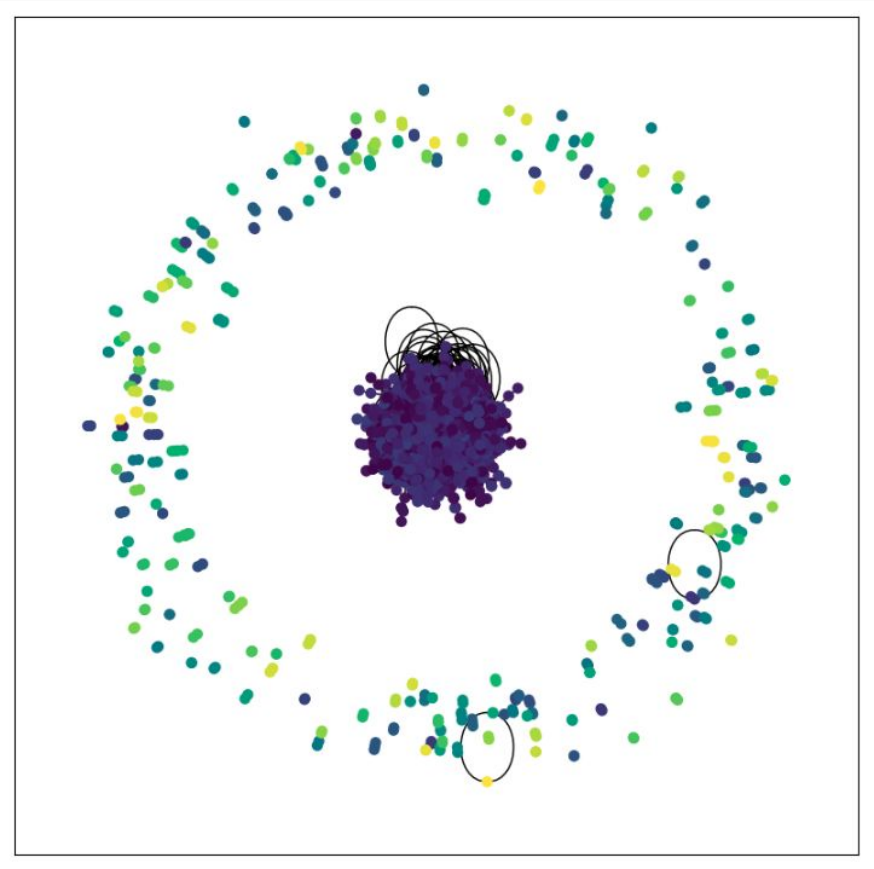
```
import networkx as nx
import pandas as pd

data = pd.read_csv('comm557_network_df.csv')

# Create a graph from the data
G = nx.from_pandas_edgelist(data, 'source', 'target')
G_undirected = G.to_undirected()

# Find connected components
connected_components = list(nx.connected_components(G_undirected))
num_connected_components = len(connected_components)
largest_component = max(connected_components, key=len)
size_largest_component = len(largest_component)

# Results
print("Number of Connected Components:", num_connected_components)
print("Size of Largest Component:", size_largest_component)
```

```
Number of Connected Components: 221
Size of Largest Component: 17605
```



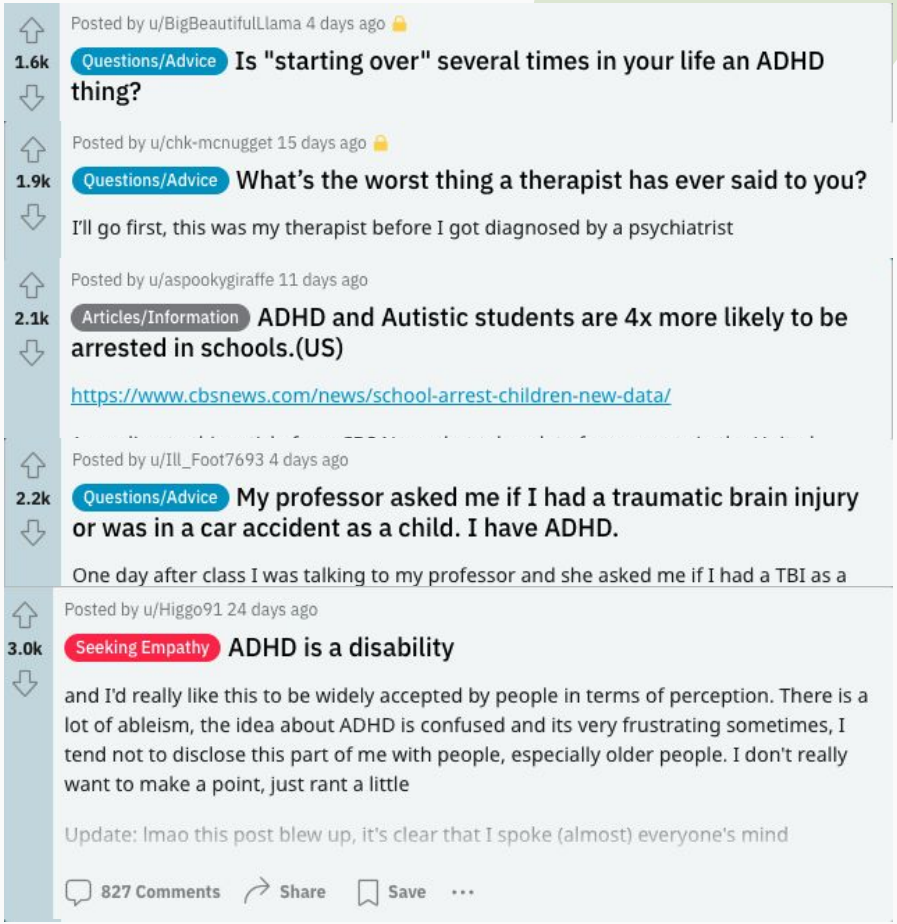
Visualization of the Communities

- A community is a group of nodes (users) that have denser connections amongst themselves compared to the rest of the network
- These dense connections often indicate shared interests or topics of discussion



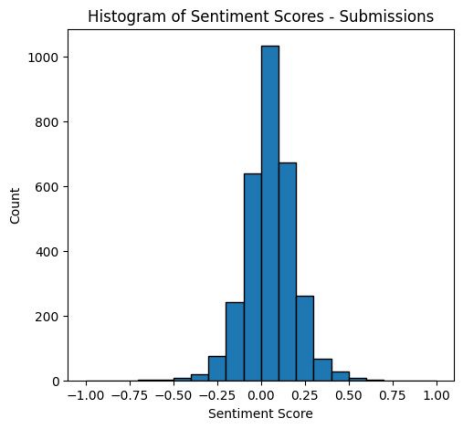
Potential Topics of Discussion

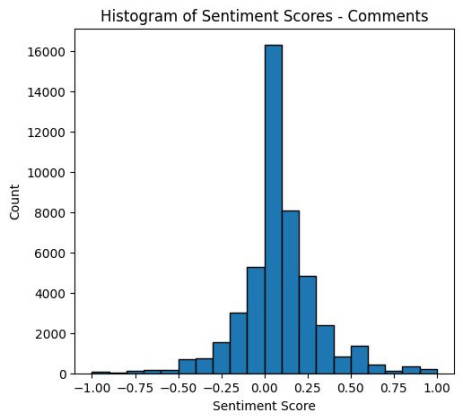
Within this month:
2,305 Comments
10,800 Upvotes



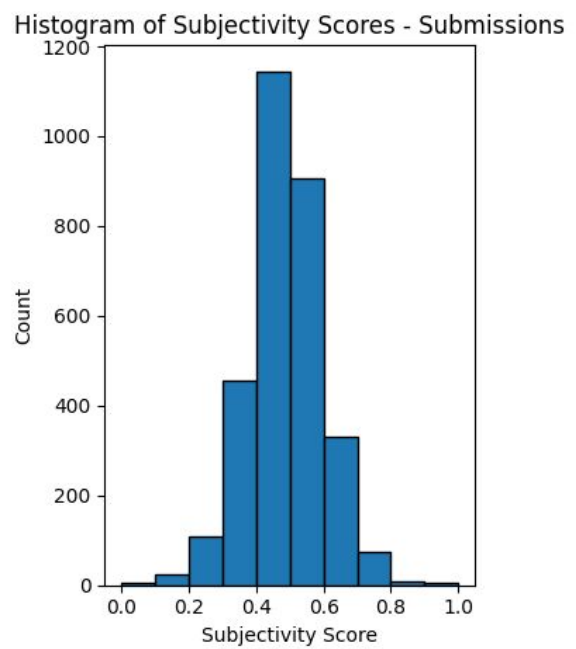
Previous Sentiment Analysis Takeaways Remain

1. Overall, among submissions and comments, sentiments are primarily positive, followed by negative then neutral
2. Average sentiment slightly positive for both, but higher for comments than submissions
3. Comments show more extreme sentiment (higher positives and lower negatives) than submissions
4. Comments are much more likely to be neutral than submissions

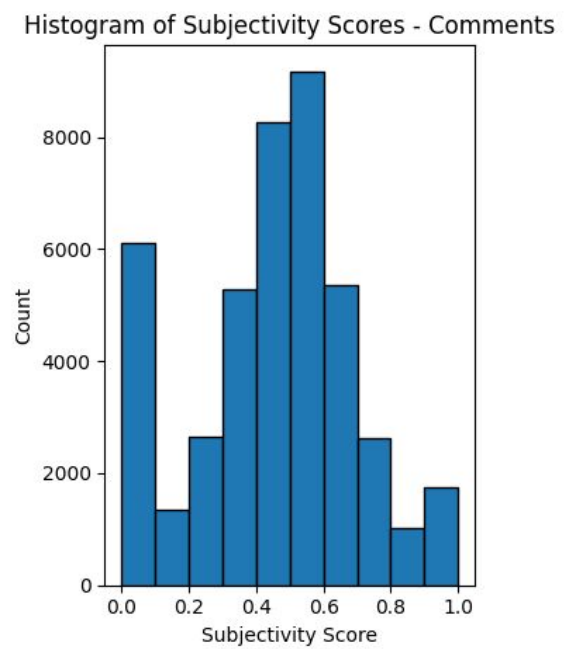




Subjectivity

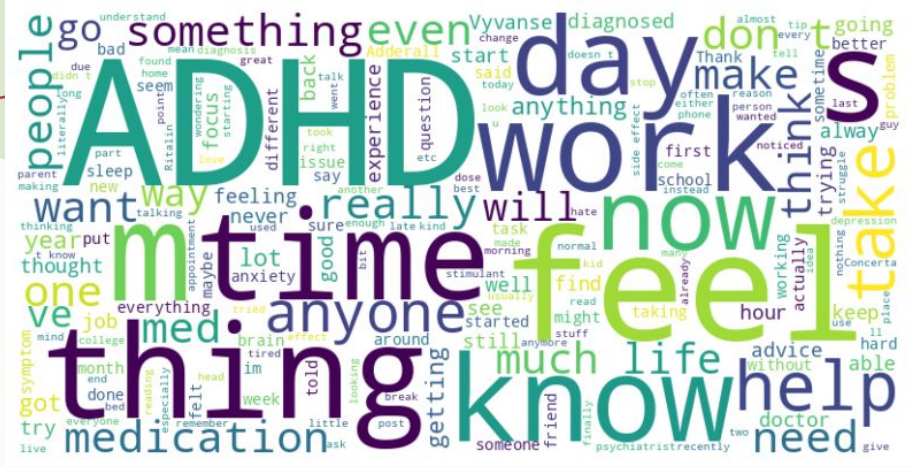


Avg Subjectivity: 0.49



Avg Subjectivity: 0.44

H2 Submissions and comments will differ in terms of subjectivity



Submissions

Comments

H3

Prominent topics will be work, sleep, and medication

Top 3 Non-Trivial Words After "ADHD"

Submissions		Comments	
1	feel: 0.86	1	time: 0.67
2	work: 0.59	2	work: 0.67
3	time: 0.58	3	feel: 0.51

- No noteworthy correlations with sentiment
- The 0.86 vs. 0.51 frequency of "feel" contributes to how comments are more likely to be neutral and tend to be lower in subjectivity
- People are more able to be neutral and objective about other's experiences than their own
- Relates to psychological principles: selective attention, self-serving bias, etc.

Opportunity for Increased Satisfaction with Medications

Medication	Avg Sentiment Score*
Vyvanse	0.036
Concerta	0.029
Adderall	0.023
Ritalin	0.023
Guanfacine	0.018
Dexedrine	0.001
Atomoxetine	-0.01
Clonidine	-0.012

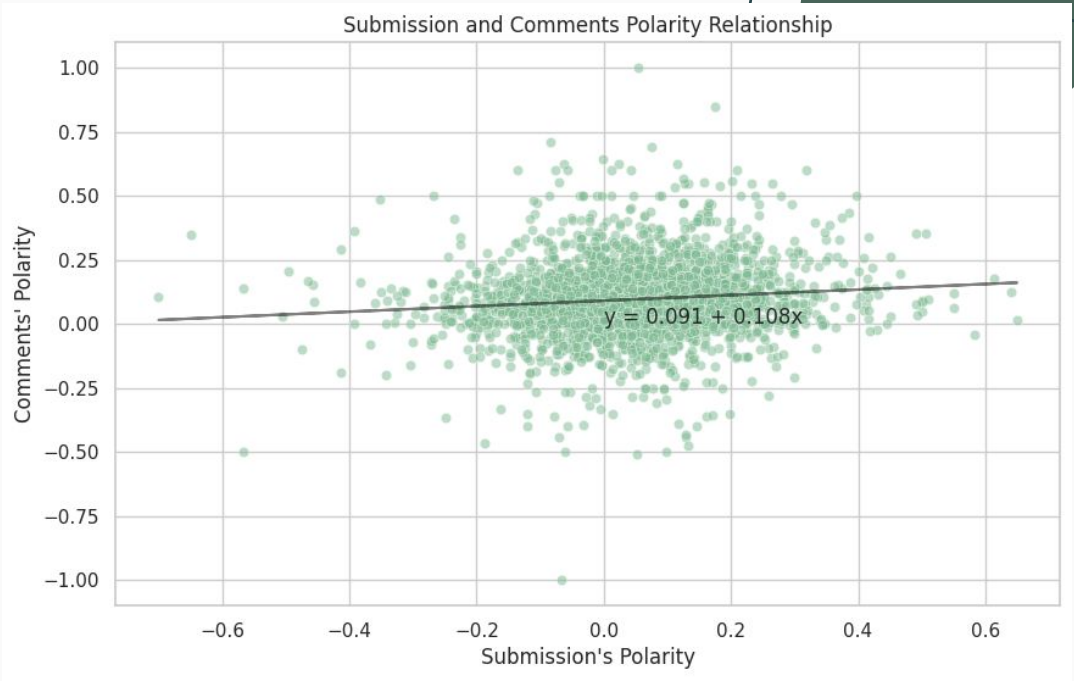
*for sentences within submissions that contain said medication. Compare to 0.052 average sentiment for submissions overall

Emotional Contagion

Submissions and comments
Pearson's R: 0.108

Comments and comments
t-statistic: 0

- Weak, positive relationship
- If there is a positive tone in submissions or comments, then there also tends to be a positive tone in the comments



H4 Users within the same submission will share similar sentiments

Key Insights

Structure

People find connection within larger communities through subgroups

Subjectivity

People are more objective about other's experiences than their own, relating to psychological theories (selective attention, self-serving bias)

Medication

There is need for improvement in ADHD medication options

Emotion

People in r/ADHD demonstrate empathy (Brown, 2011) & are willing to meet others in their emotions

Thank you!

Questions?

Divider

Us

Venus has a beautiful name and is the second planet from the Sun. It’s terribly hot—even hotter than Mercury

Them

Mercury is the closest planet to the Sun and the smallest one in the Solar System—it’s only a bit larger than our Moon

SOLUTION

Venus has a beautiful name and is the second planet from the Sun. It's terribly hot—even hotter than Mercury—and its atmosphere is extremely poisonous. It's the second-brightest natural object in the night sky after the Moon

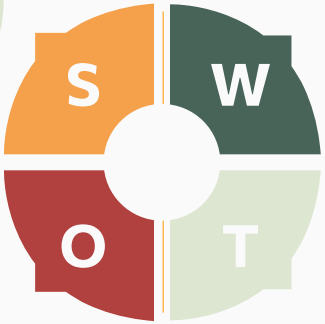
SWOT ANALYSIS

Mercury

Mercury is the closest planet to the Sun

Venus

Venus is the second planet from the Sun



Jupiter is the biggest planet of them all

Jupiter

Neptune is the farthest planet from the Sun

Neptune

PRODUCT OVERVIEW

Venus

Venus has a beautiful name, but extremely high temperatures. Its atmosphere is toxic

Saturn

This is the ringed one. It’s a gas giant composed of hydrogen and helium

OUR PLANS

01

Basic

Saturn is a gas giant, composed mostly of hydrogen and helium

02

Pro

Jupiter is the biggest planet in the entire Solar System

03

Premium

Despite being red, Mars is a cold place full of iron oxide dust

CASE STUDY

Jupiter is the fourth-brightest object in the sky

Challenge

Despite being red, Mars is a very cold place. The planet is full of iron oxide

Results

Solution

Saturn is a gas giant composed mostly of hydrogen and helium

REVIEWS

Mercury is the closest planet to the Sun and the smallest one in the Solar System—it's only a bit larger than our Moon

Helena James

Despite being red, Mars is a cold place, not hot. The planet is full of iron oxide dust, which gives the planet its reddish cast

John Patterson

AWARDS

2019

Saturn is the ringed one. It’s a gas giant composed mostly of hydrogen and helium

2020

Venus has a beautiful name and is the second planet from the Sun

MARKET SIZE

60% Saturn

Saturn is a gas giant, composed mostly of hydrogen and helium

30% Mars

Despite being red, Mars is a very cold place full of iron oxide

10% Venus

Venus has a beautiful name and is the second planet from the Sun

Follow the link in the graph to modify its data and then paste the new one here. **For more info, click here**

TARGET

70% **30%**

- 25 - 45 years
- 45 - 55 years

Hobbies

60% **20%**

Gender

Saturn is a gas giant composed mostly of hydrogen and helium

90% **10%**

- 25 - 45 years
- 45 - 55 years

Hobbies

COMPETITORS

Mercury

Mercury is the closest planet to the Sun and the smallest one in the Solar System

Mars

Despite being red, Mars is a cold place, not hot. The planet is full of iron oxide dust

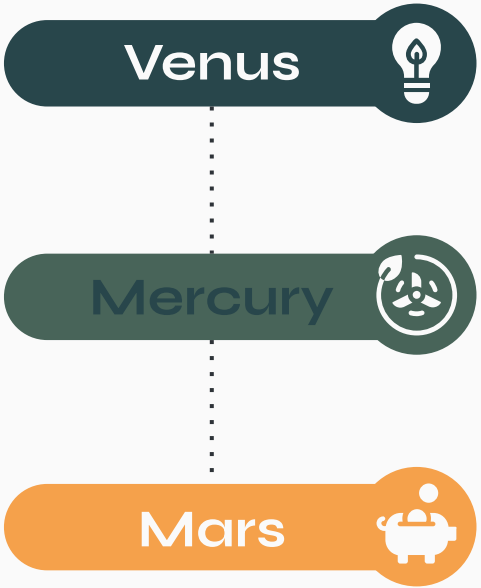
Venus

Venus has a beautiful name and is the second planet from the Sun. It’s terribly hot

Jupiter

The biggest planet in the Solar System. It’s the fourth-brightest object in the sky

BUSINESS MODEL



The second planet from the Sun. It’s terribly hot

Mercury is the closest planet to the Sun

Despite being red, Mars is a cold place

TIMING

Day 1

Mercury is the closest planet to the Sun

Day 2

Despite being red, Mars is a cold place

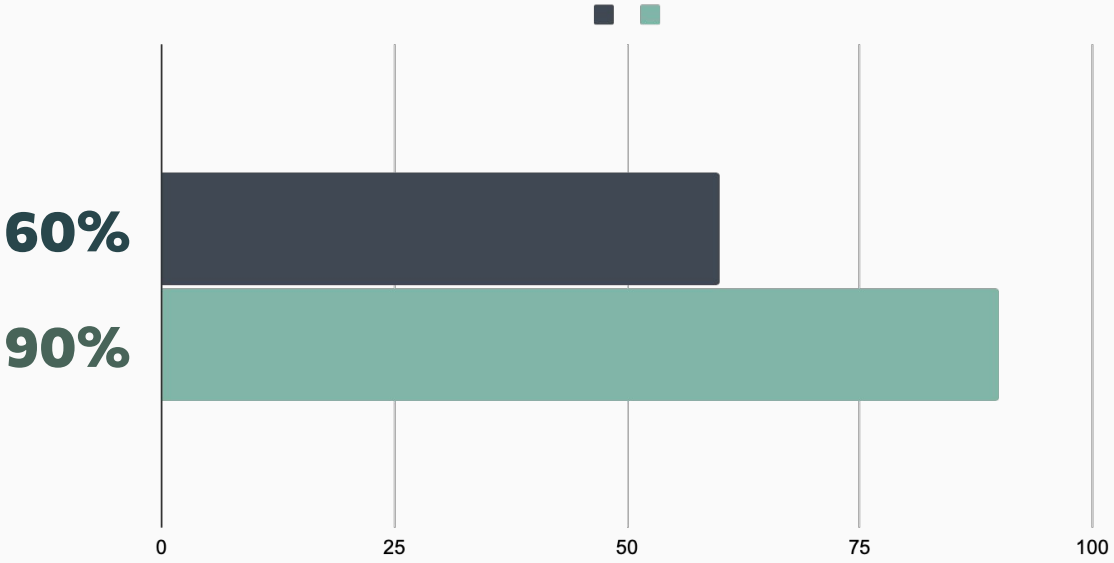
Day 3

The Earth is the planet we all live on

Day 4

Jupiter is the biggest planet

PREDICTED GROWTH



Mars

Despite being red, Mars is a cold place

Jupiter

The biggest planet in the Solar System

Follow the link in the graph to modify its data and then paste the new one here. **For more info, click here**

THE SLIDE TITLE GOES HERE!

Do you know what helps you make your point clear?
Lists like this one:

- They’re simple
- You can organize your ideas clearly
- You’ll never forget to buy milk!

And the most important thing: the audience won’t miss the point of your presentation

SIX COLUMNS

Mars

Mars is actually a very cold place

Mercury

It's the closest planet to the Sun

Venus

It has extremely high temperatures

Saturn

Saturn is the ringed one and a gas giant

Neptune

The farthest planet from the Sun

Jupiter

Jupiter is the biggest planet of them all

AWESOME WORDS

A PICTURE IS WORTH A THOUSAND WORDS

A PICTURE ALWAYS REINFORCES THE CONCEPT

Images reveal large amounts of data, so remember: use an image instead of a long text. Your audience will appreciate it

4,498

Big numbers catch your audience’s attention

24h 37m 23s

Is Jupiter's rotation period

333,000,000

Earths fit in the Sun’s mass

386,000 km

Distance between the Earth and the Moon

THE TABLES

City	Population	Wind and solar share of electricity mix	Renewable share of electricity mix (2021)
Sweden	156,000	100%	83%
United States	139,000	90%	75%
India	52,000	70%	65%
Australia	1,300,000	65%	60%
Spain	3,260,000	95%	90%

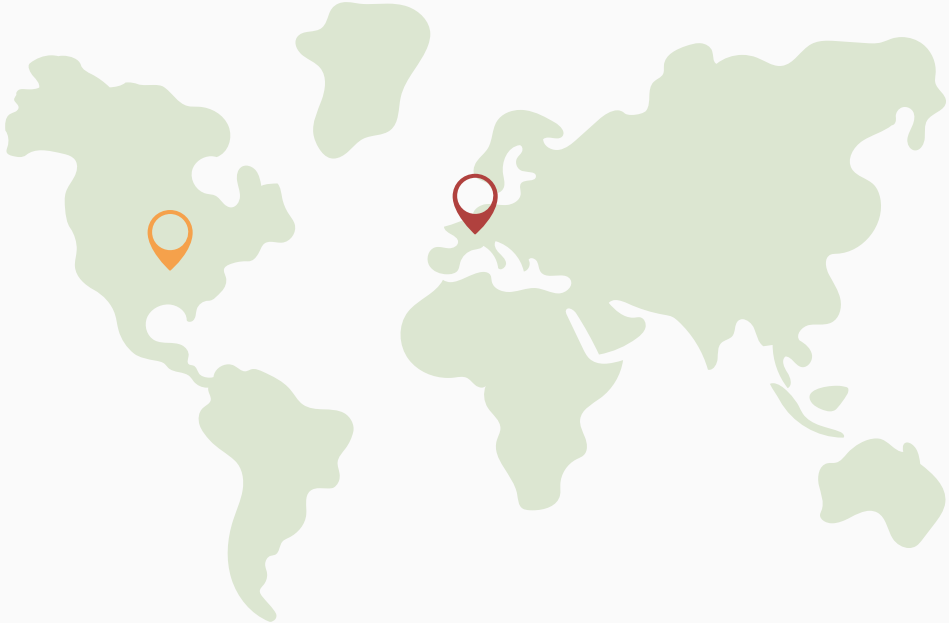
THIS IS A MAP

Venus

Venus has a beautiful name and is the second planet from the Sun. It’s terribly hot

Jupiter

The biggest planet in the Solar System. Jupiter is the fourth-brightest object in the sky



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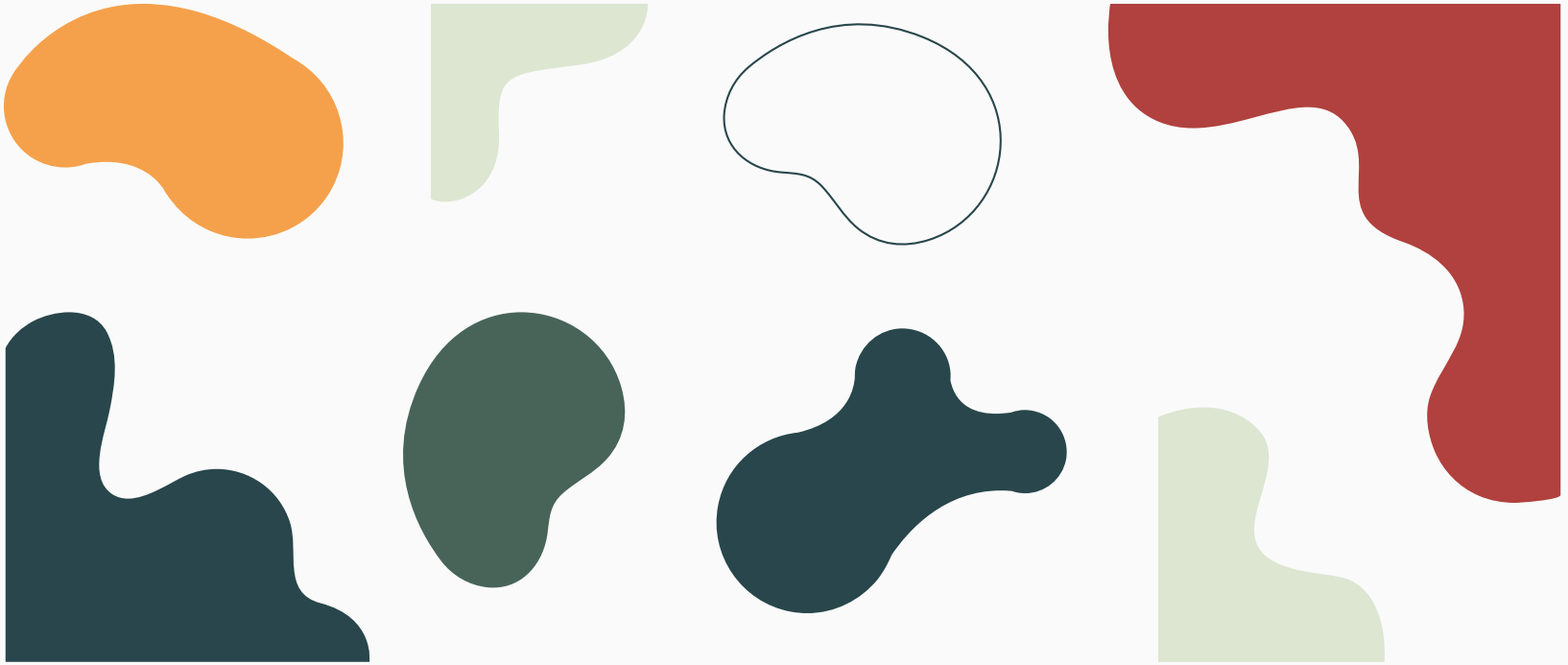
RENEWABLE ENERGY ICON PACK

ALTERNATIVE RESOURCES



RESOURCES

Photos

- Man using tablet for an eco project
- Woman showing wind energy innovation
- Portrait of brunette smiley woman
- Portrait of mature woman smiling
- Young man posing outdoor

Vectors

- Zero waste landing page
- Abstract organic shapes banners
- Technology devices

Icon

- Renewable energy icon pack

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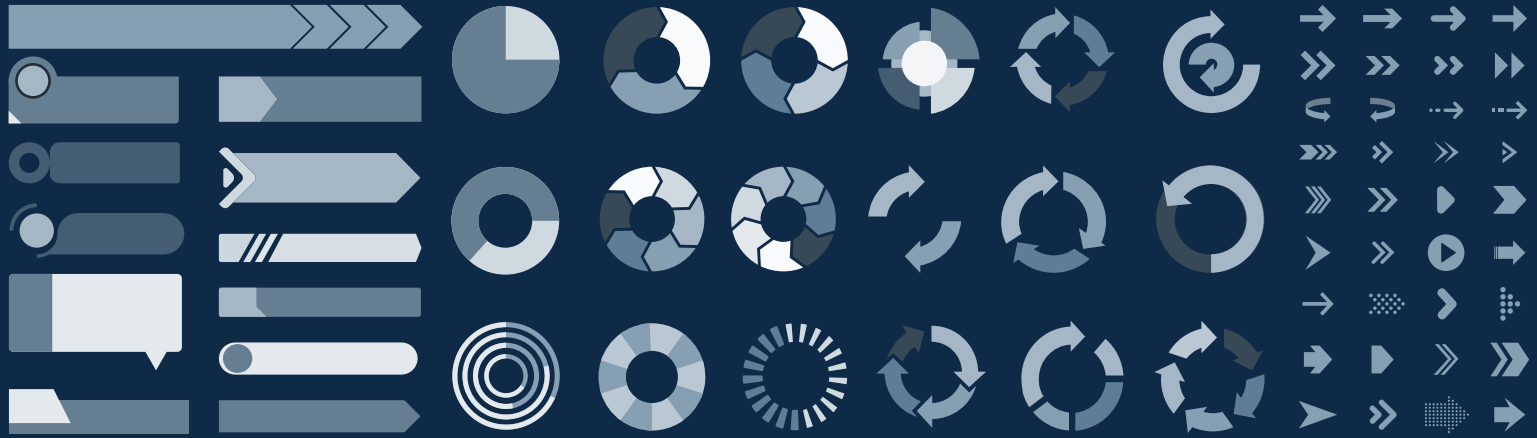

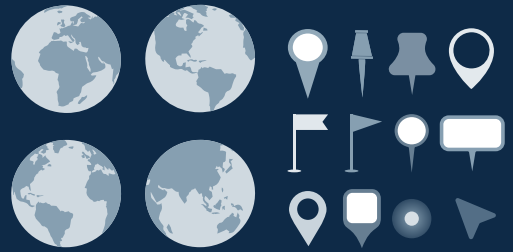

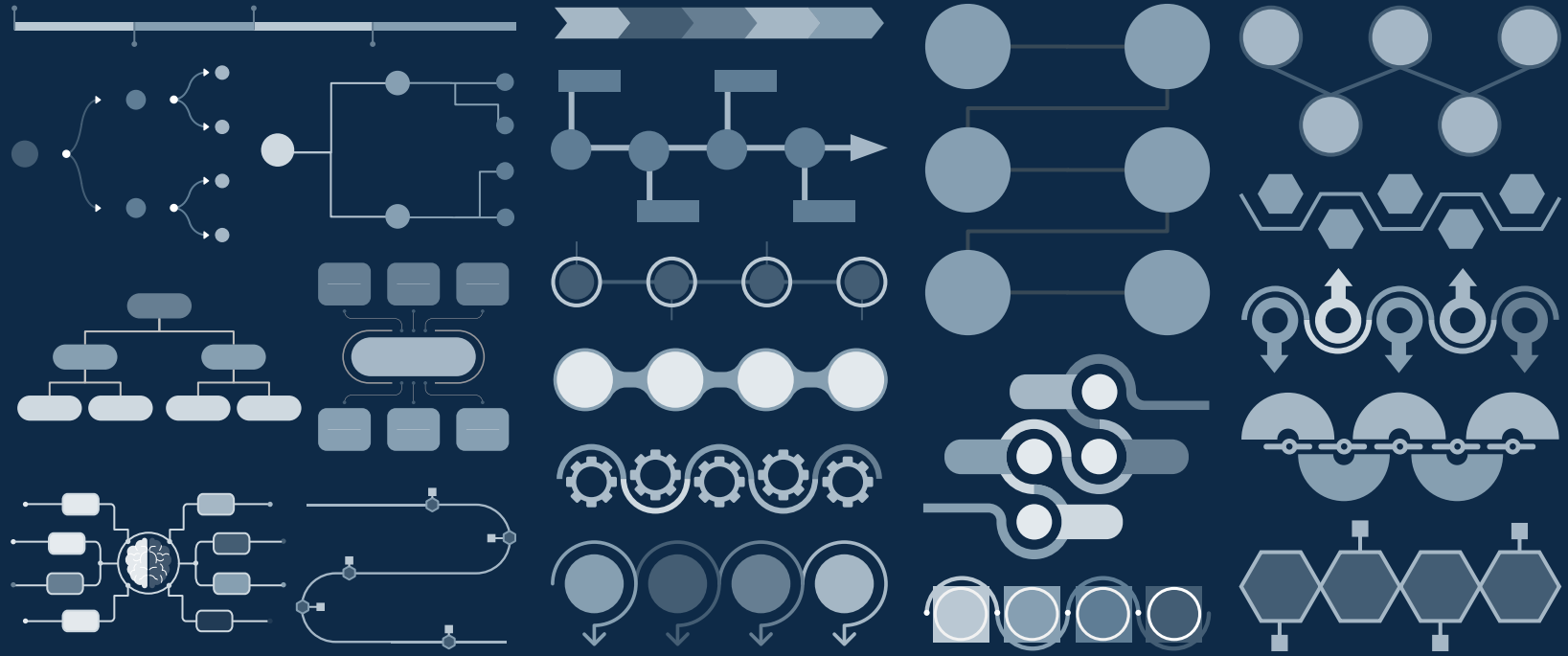

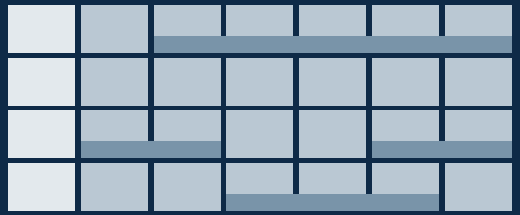

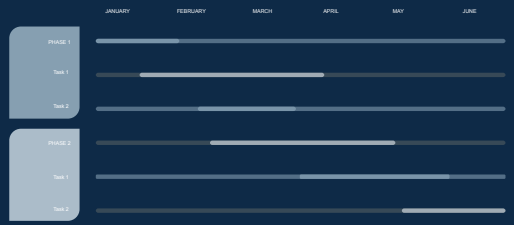
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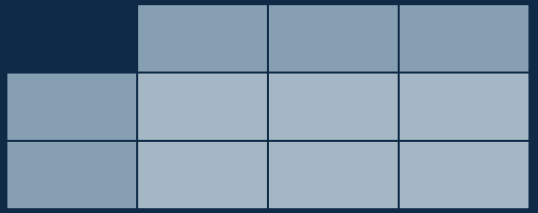

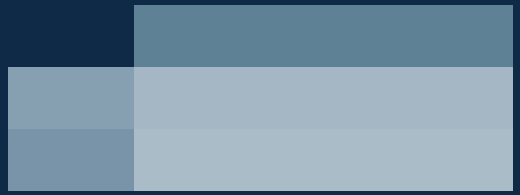

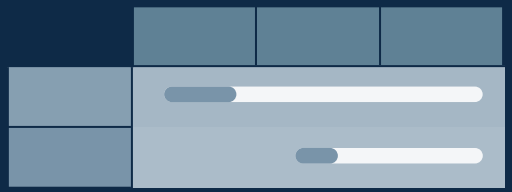

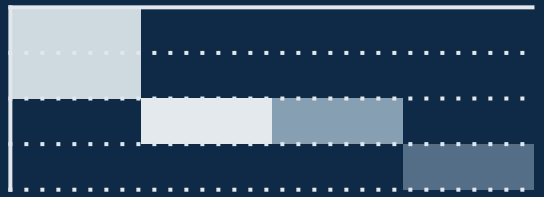

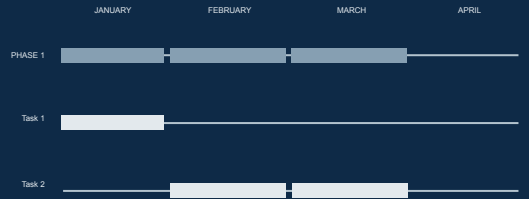
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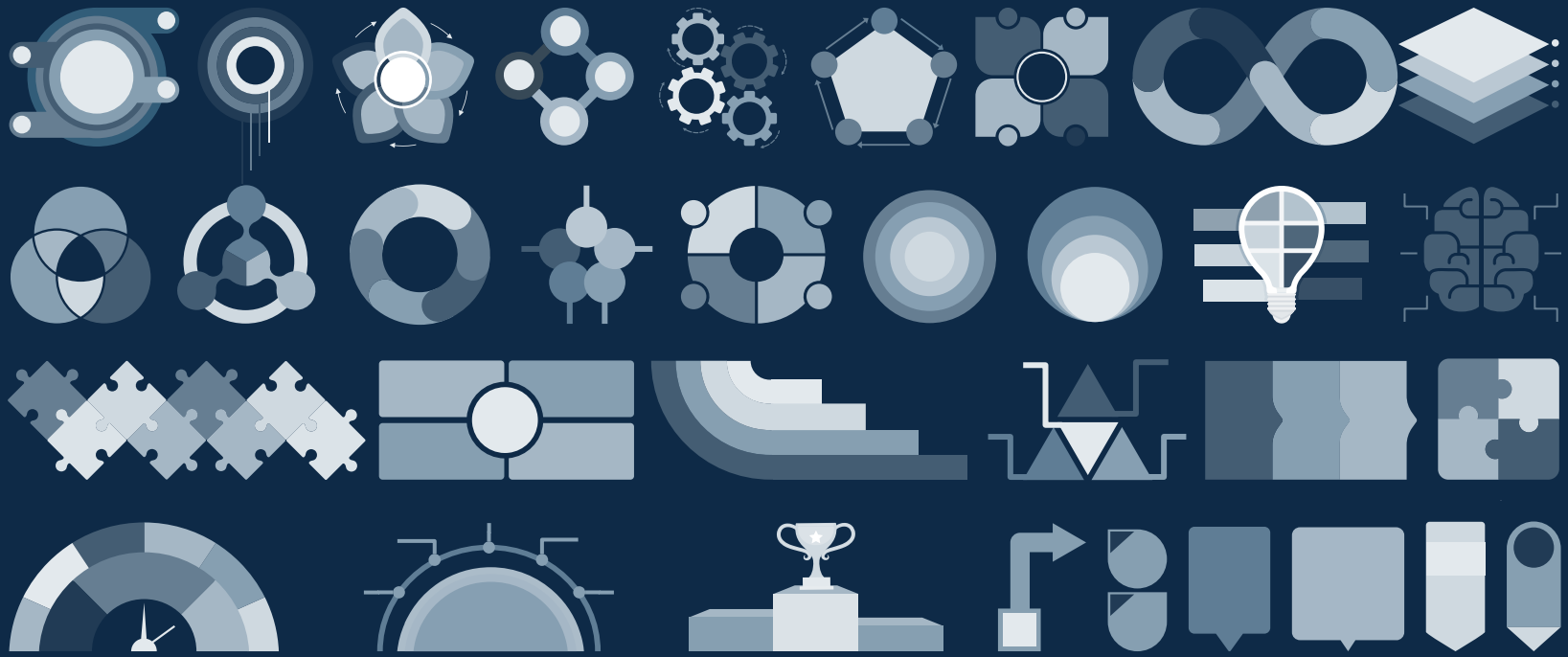

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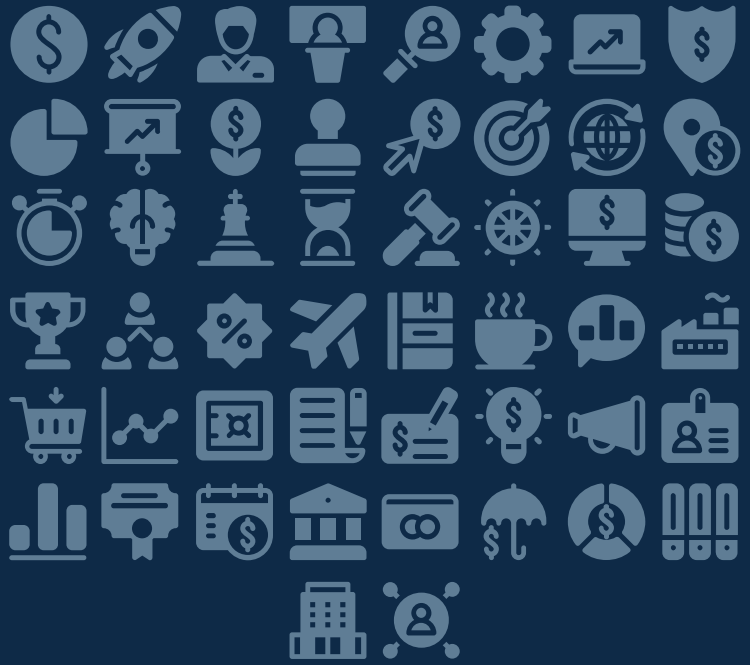
Educational Icons

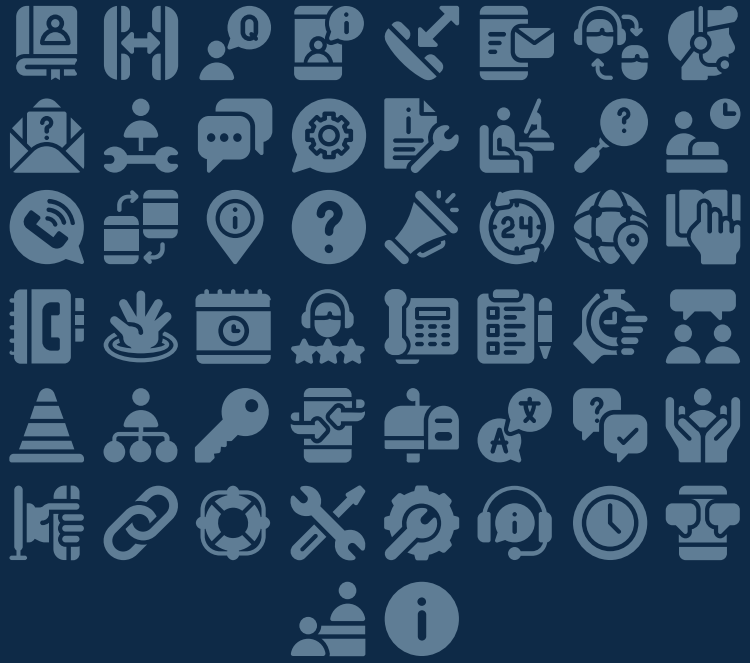
Medical Icons

Business Icons

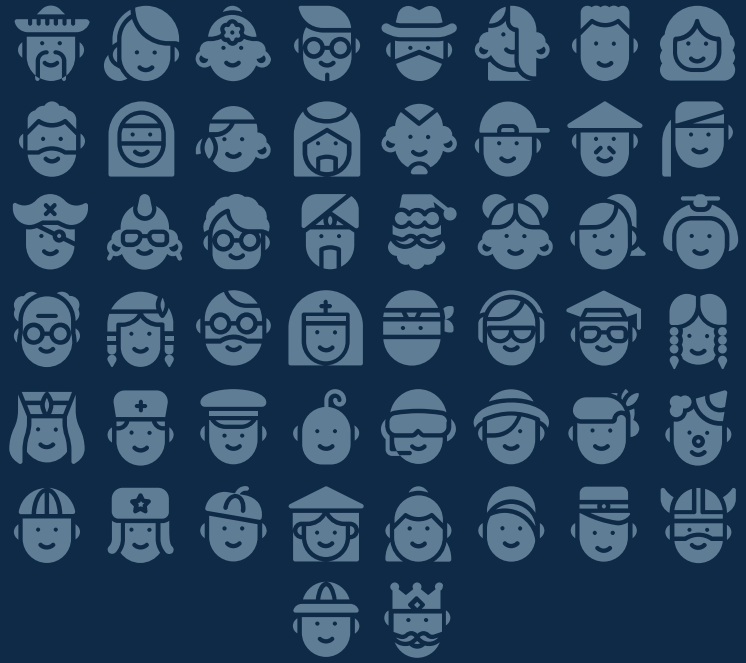


Teamwork Icons

Help & Support Icons



Avatar Icons



Creative Process Icons

Performing Arts Icons

Nature Icons

SEO & Marketing Icons

slidesgo