



AUTOMATED HEALTH INFORMATION SYSTEM

Presented By: MDS2

Foo Kai Yan

Alicia Quek
Chik Wen

Eunice Lee
Wen Jing

Jesse Yow
San Gene

Supervised by: Dr Muhammad Fermi Pasha



OUR TEAM



KAI YAN

Project Manager



ALICIA QUEK

Web App Tech Lead



EUNICE LEE

Quality Assurance



JESSE YOW

Model Tech Lead

TABLE OF CONTENTS

01

Project Overview
& Requirements

02

Project Outcome

03

Project Methodology

04

Software Deliverables

05

System Architecture

0

06

Software Demonstration

07

Critical Discussion

08

Future Work & Improvement

0

09

Question & Answer



Eunice Lee

PROJECT OVERVIEW & REQUIREMENTS



Objectives

Enhance healthcare data management by automating data entry through the integration of advanced Image Cropping (ICROP) and Handwritten Text Recognition (HTR) models, significantly reducing manual workload and improving efficiency.



Limitations

- **System Flexibility:** The system relies on a fixed patient registration form structure.
- **Mobile Compatibility:** The current version lacks full integration for mobile devices.



Scope

- **Comprehensive Healthcare Data Management:** The system enables efficient patient registration, appointment scheduling and diagnosis.
- **Automation at its Core:** Integrated HTR and ICROP models ensure seamless automation for digitizing handwritten data, enhancing accuracy and reducing manual input.

PROJECT OUTCOME

Dynamic Web-Based Health Information System

Created user-friendly platform that optimizes patient management processes in a single solution.



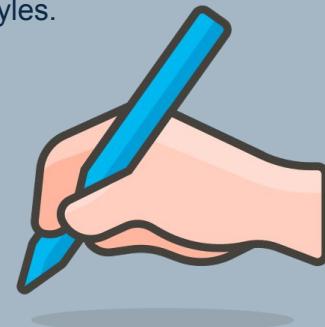
Seamlessly Integrated Advanced HTR and ICROP Models

Models that can automatically capture and digitize handwritten information



Achieved Robust Handwriting Analysis

Equipped the system to efficiently analyze and transcribe both cursive and non-cursive handwriting styles.



METHODOLOGY

Languages

HTR and ICROP Model:

- Python

Web Application:

- JavaScript
- TypeScript
- HTML
- CSS

Frameworks

HTR and ICROP Model:

- Tensorflow

Web Application:

- MEAN Stack
 - MongoDB
 - Express
 - Angular
 - Node

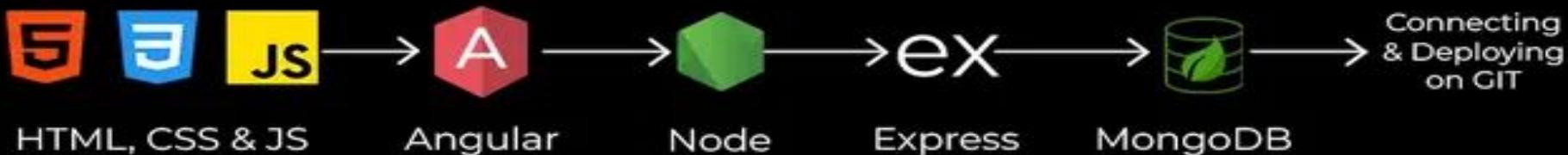
Libraries

HTR and ICROP Model:

- Edit Distance
- Lightning
- Memory-Mapped Database (Imdb)
- Matplotlib
- Numpy
- OpenCV-python
- Path.py
- Tensorflow

Web Application:

- Socket.io
- Express
- Bootstrap



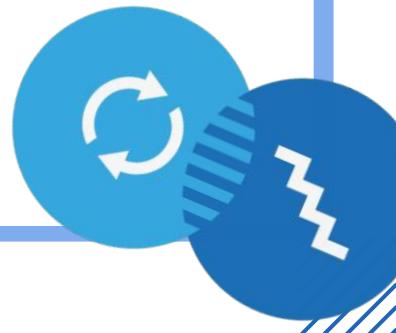
METHODOLOGY

Project Management

- Hybrid methodology
 - Agile methodology
 - Small-Scale Scrum Framework
 - Flexible
 - Adapt easily to sudden incoming changes
 - Waterfall methodology
 - Web Application development framework
 - Requirements, design, implementation, and testing stages for each feature within the web application

HTR and ICROP Model

- The main dataset utilized in this project is for the HTR and ICROP Model
- Pre-trained HTR model was discovered and used
- Developed an image cropping (ICROP) Model to pair with the HTR model



SOFTWARE DELIVERABLES

Operational Web Application Integrated with HTR and ICROP Models

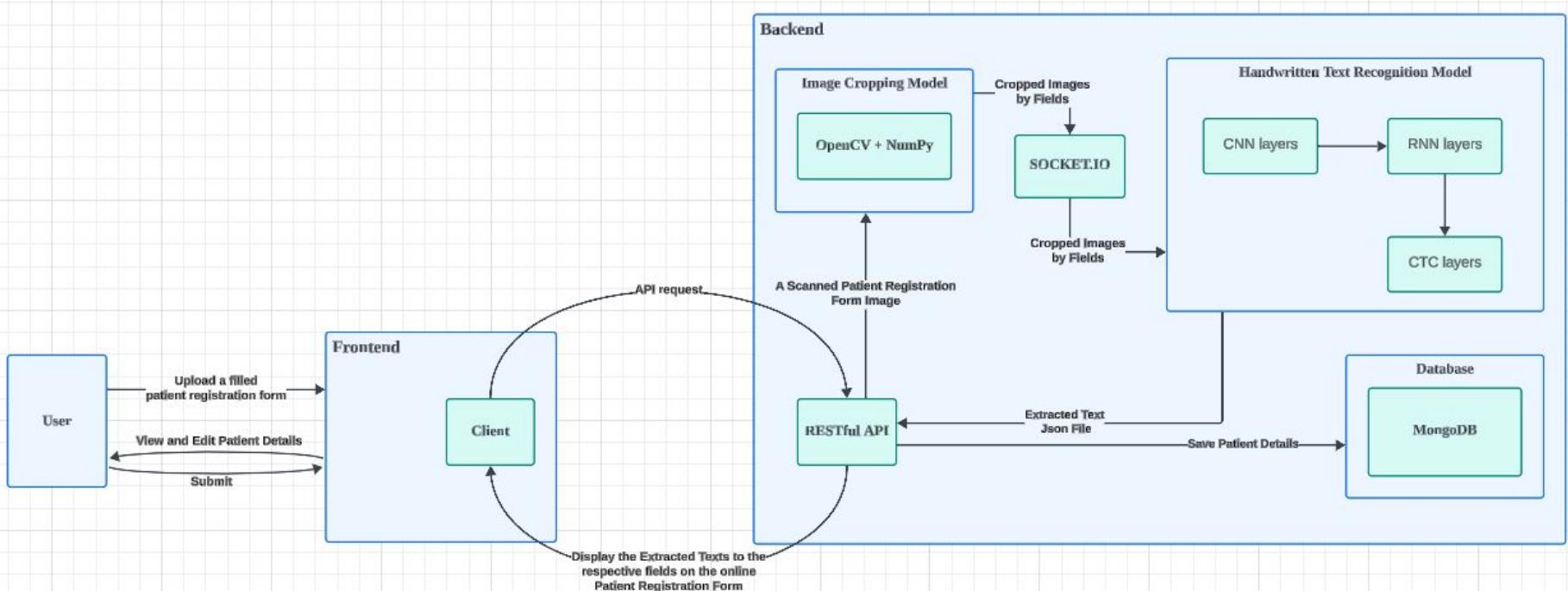
Web Application is accessible via local HTML page at <http://localhost:8080/home#/>

Components and Features:

- Login
 - Passwords are encrypted when saving in database
- Register patients with HTR Model
 - If extraction was selected, the form will be pre-filled for the user to check
- Schedule appointments between physicians and patients
 - Users can start the appointment and fill in consultation and diagnosis details
 - If required, users can prescribe prescription under each diagnosis



SOFTWARE ARCHITECTURE





SOFTWARE ARCHITECTURE



Input Example:

MediCare

New Patient Registration Form

Personal Details	
Patient's First Name :	Eunice
Patient's Last Name :	Lee
Date of Birth (DD - MM - YYYY) :	19-12-2002
Gender (Male/ Female) :	Female
Nationality :	Malaysian
Identification Number (IC) / Passport :	01219191196
Marital Status (Single/ Married/ Divorced/ Widowed) :	Single
Contact Number (+60) :	012-6681311
Email :	eunicelee1219@gmail.com
Address :	Kota Damansara
City :	Petaling Jaya
State :	Selangor
Postal/ Zip Code :	47810
Emergency Contact	
First Name :	Kai Ran
Last Name :	Foo
Relationship :	Friend
Contact Number (+60) :	012-333 5555

I certify that the information provided is complete and accurate to the best of my knowledge.

Signature of Patient: _____ Date: _____

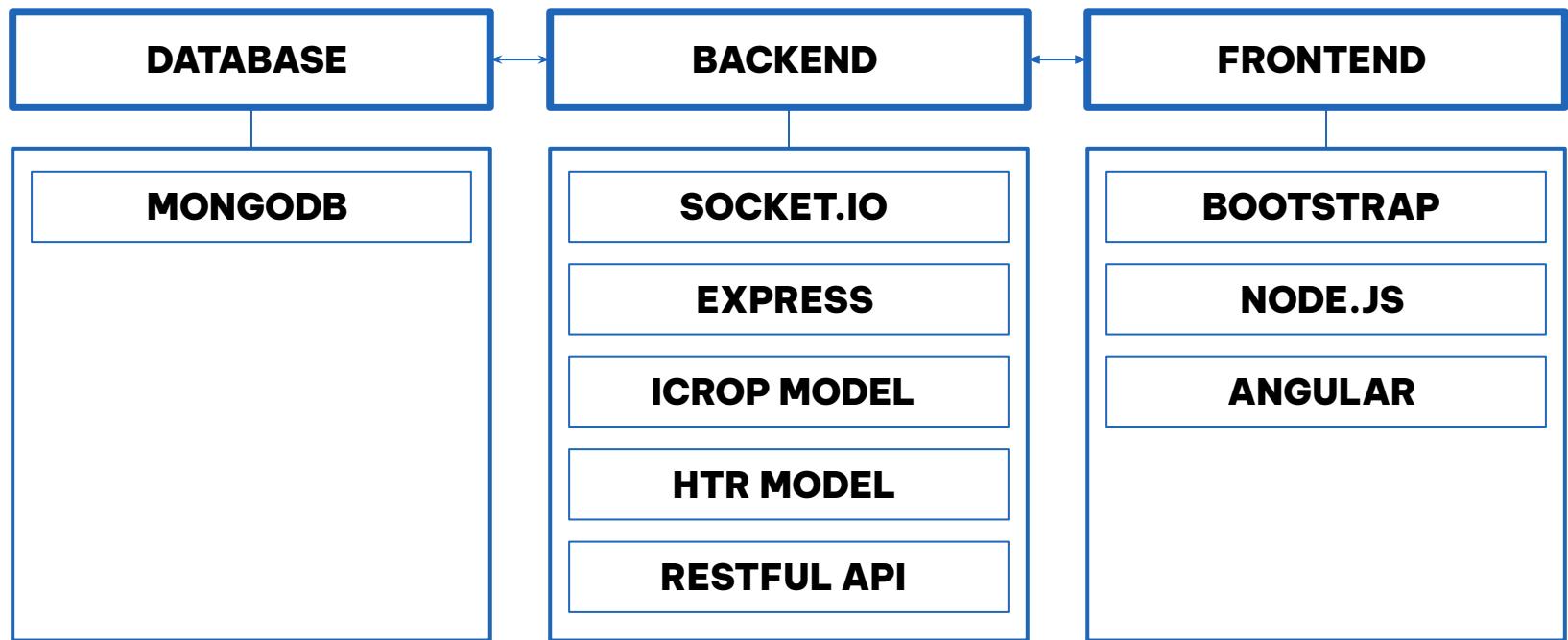
Output Example:

Patient Registration Form

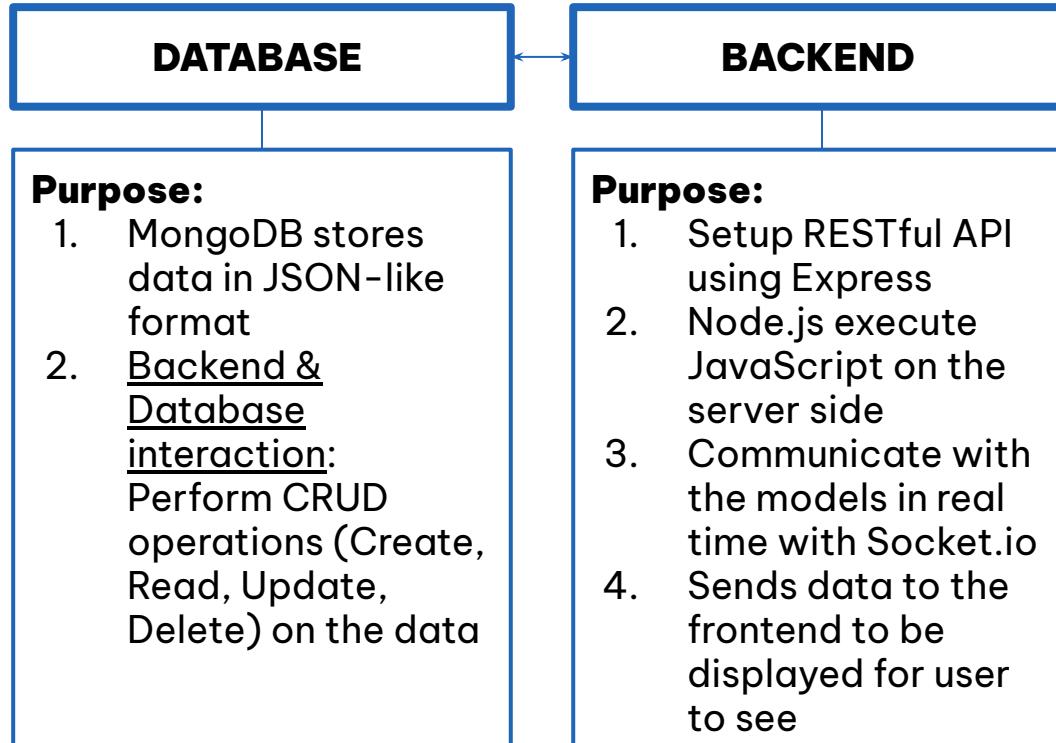
Fill in the Patient details and Click Submit to register a new patient.

Name	<input type="text" value="Eunice"/> Lee		
Date of Birth	<input type="text" value="19/12/1992"/> <input type="button" value=""/>	Gender	<input type="radio"/> female
Nationality	<input type="text" value="malaysian"/>	Identification Number (IC)	<input type="text" value="0111914 1196"/>
Marital Status	<input type="text" value="single"/>		
Contact Number	<input type="text" value="012-6681311"/>	E-mail	<input type="text" value="eunicelee1219@gmail.com"/>
Address:			
City	<input type="text" value="Kota Damansara"/>	State	<input type="text" value="Selangor"/>
Postal / Zip Code			
<input type="text" value="47810"/>			
Emergency Contact			
Name	<input type="text" value="Kai Ran"/> Do		
Relation	<input type="text" value="Friend"/>	Contact Number	<input type="text" value="012-333 5555"/>
Upload Form Image for Automated Extraction			
<input type="button" value="Choose File"/> <input type="text" value="form.jpg"/> <input type="button" value="Extract Complete"/>			
<small>*NOTE: Double Check Input Details before Click Submit.</small>			

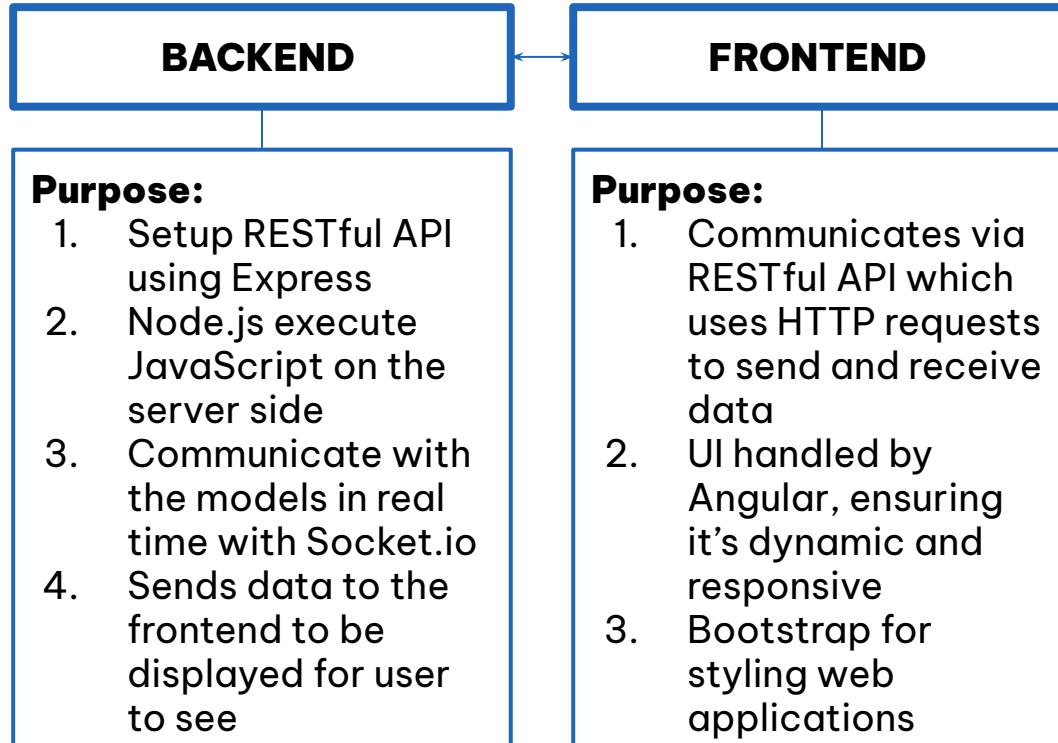
SOFTWARE ARCHITECTURE



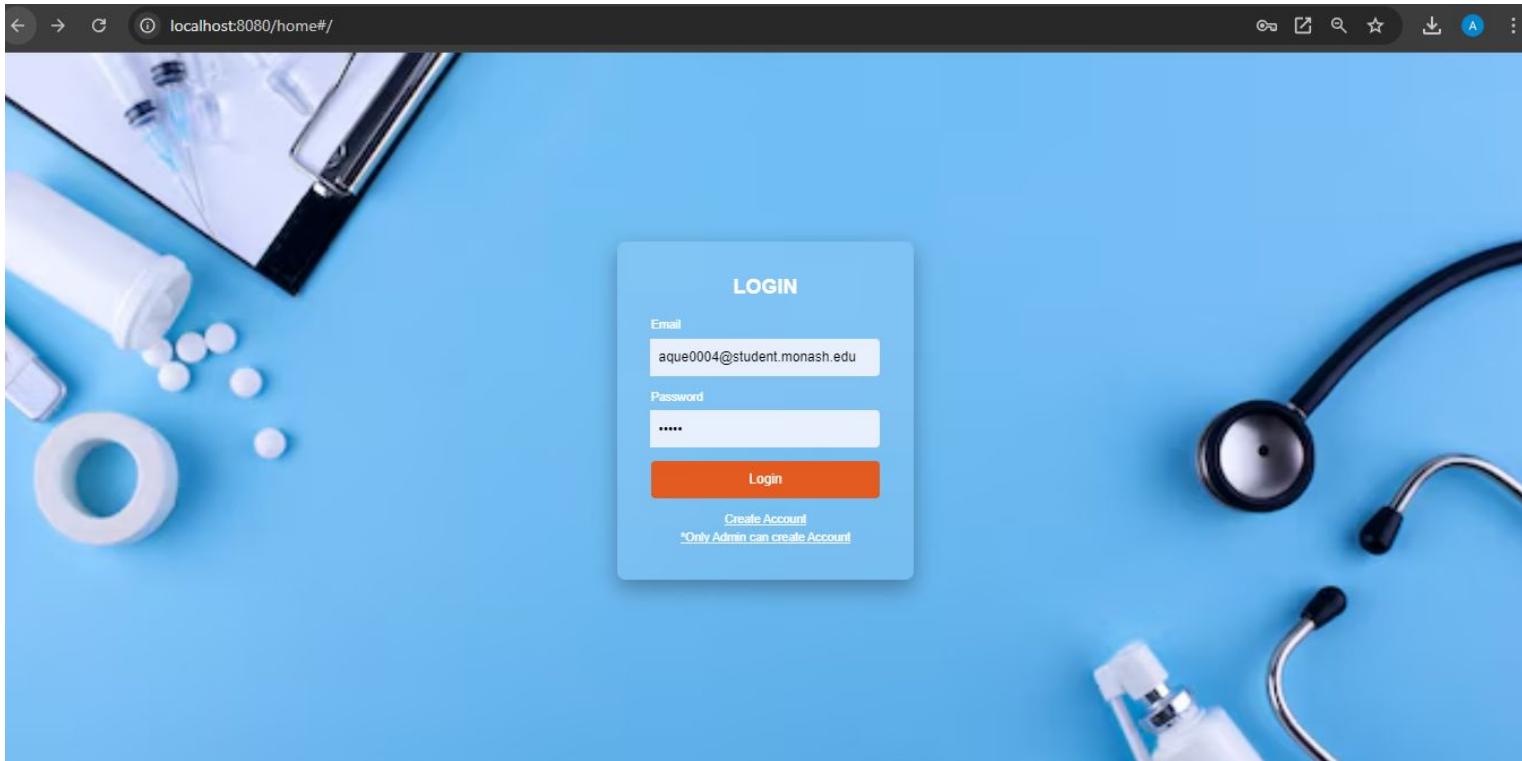
SOFTWARE ARCHITECTURE



SOFTWARE ARCHITECTURE



SOFTWARE DEMONSTRATION



SOFTWARE DEMONSTRATION

LOGIN

Email

Password

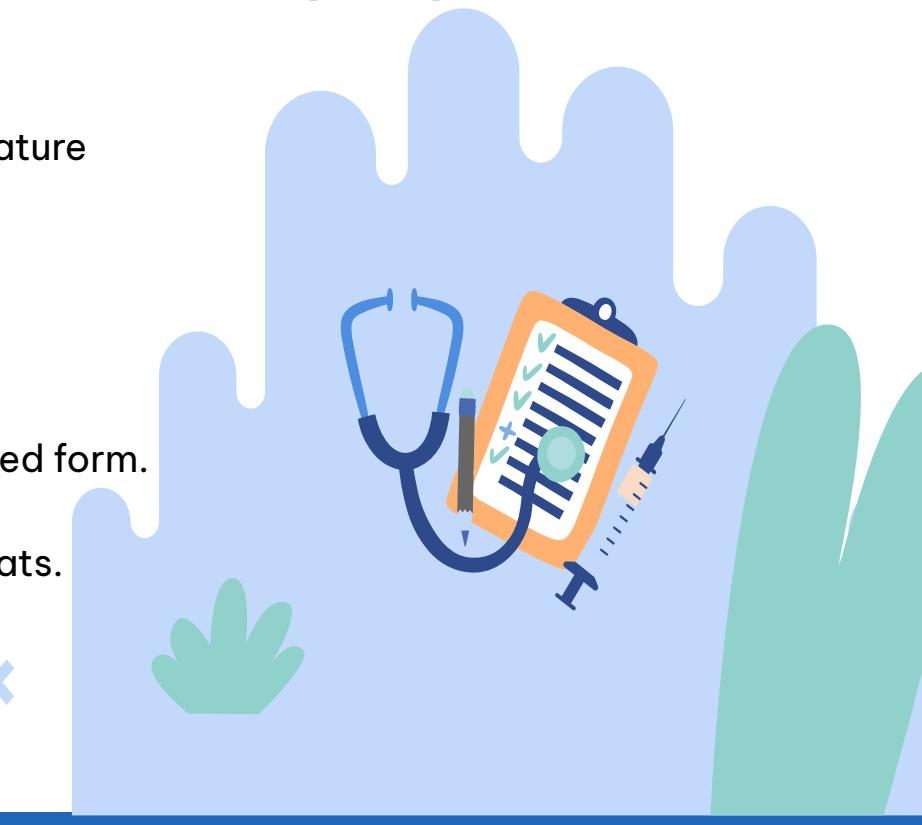
Login

[Create Account](#)

*Only Admin can create Account

SOFTWARE LIMITATIONS

- The web application lack a search box feature
- HTR model has too many dependencies.
- HTR may occasionally compute slowly.
- ICROP model works on a specific structured form.
- ICROP model only works with image formats.
(E.g JPG, PNG)



CRITICAL DISCUSSION

 Success	 Challenges	 Changes during project
<ul style="list-style-type: none">• HTR model is able to achieve high accuracy(>75%)• Interactive website successfully implemented	<ul style="list-style-type: none">• Inconsistent Performance with Background Shadows• HTR model is unable to recognize most symbols(e.g @,#,!?,)• Website responsiveness issues.	<ul style="list-style-type: none">• Extended project timeline due to increased assignments• Reallocated members to handle the HTR and cropping models



Results

- Completed project deliverables

FUTURE WORK



Model Improvement

Enhance consistency by exploring new learning techniques to improve generalization across various handwriting styles.

Web Application Improvement

Optimize the website's performance to ensure faster loading times and a smoother user experience.

Expand training dataset Implement user feedback system

Incorporate a diverse range of handwriting styles and symbols to enhance model accuracy and robustness.

Develop a feedback system for staff to provide feedback on the user experience of the website and the recognition accuracy of patient forms.

: : : : :

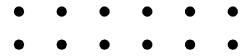


THANK YOU

Do you have any questions?







WELCOME!

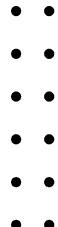
You can give a brief description of the topic you want to talk about here. For example, if you want to talk about Mercury, you can say that it's the smallest planet in the entire Solar System

• •
• •
• •
• •
• •
• •





01



ABOUT THE SPEAKERS

You can enter a subtitle here if you need it

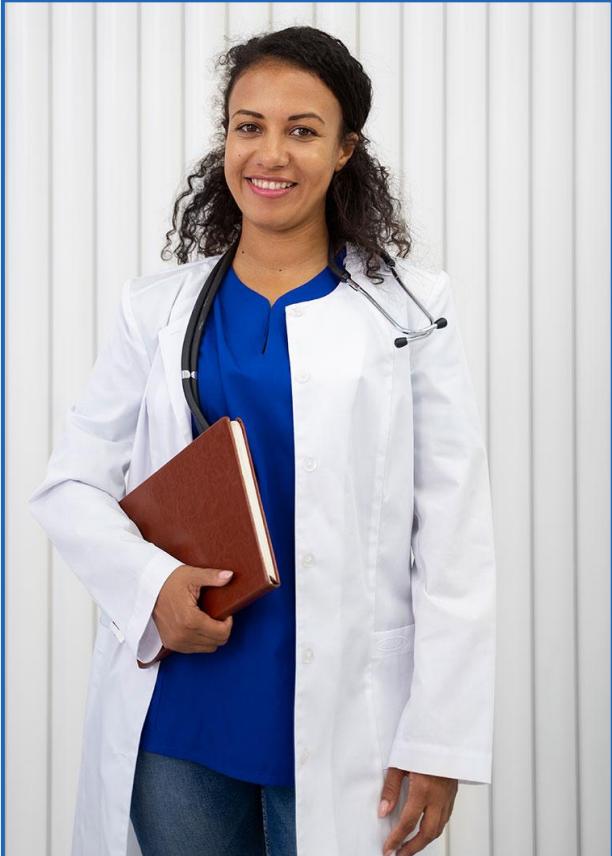
SPEAKER 01

JENNA DOE

CEO & founder

Jupiter is a gas giant and the biggest planet in the Solar System. It's the fourth-brightest object in the night sky. It was named after the Roman god of the skies and lightning

- Saturn is a gas giant and has several rings. It's composed mostly of hydrogen and helium. It was named after the Roman god of wealth and agriculture
- You can replace the image. Just right-click on it and select "Replace image"



: : : : :

“This is a quote, words full of wisdom
that someone important said and can
make the reader get inspired”

—SOMEONE FAMOUS

OUR HISTORY

Jupiter is a gas giant and the biggest planet in the Solar System. It's the fourth-brightest object in the night sky. It was named after the Roman god of the skies and lightning

Saturn is a gas giant and has several rings. It's composed mostly of hydrogen and helium. This planet was named after the Roman god of wealth and agriculture

Earth is the third planet from the Sun and the only one that harbors life in the Solar System. We all live on this planet



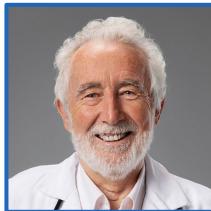


OUR TEAM OF EXPERTS



TIMMY JIMMY

Despite being red, Mars is actually a cold place



JULIAN LYMAN

Earth is the third planet from the Sun and has life



TRACEY BOWER

Saturn is the second-largest planet in the Solar System



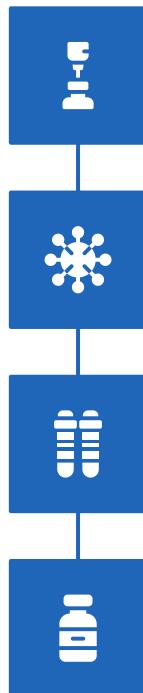
LILY REID

Neptune is the fourth-largest planet in the Solar System





TIMELINE



VENUS

Venus the second-brightest natural object in the night sky after the Moon

SATURN

Saturn was named after the Roman god of wealth and agriculture

JUPITER

Jupiter is a gas giant and the biggest planet in the Solar System

MERCURY

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





OUR BIG IDEA #2

ABOUT THE PATIENT

AGE OF THE PATIENT:	5 years old
GENDER:	Female
MEDICAL CONDITIONS:	Chest pain

CONCLUSIONS

1

VENUS

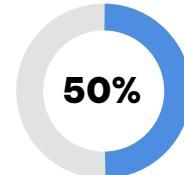
Venus is very hot

2

MERCURY

Mercury is very small

STATUS



MARS

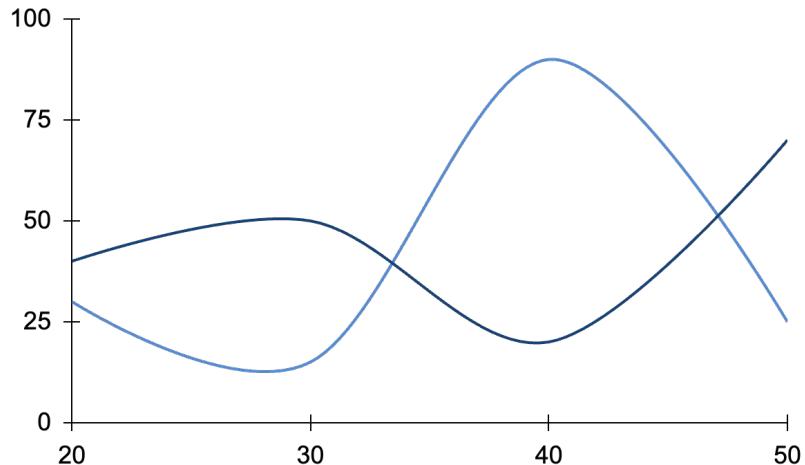
Mars is full of iron oxide dust

LOCATION



■ Jupiter is big

CHART



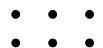
■ MERCURY

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

■ VENUS

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

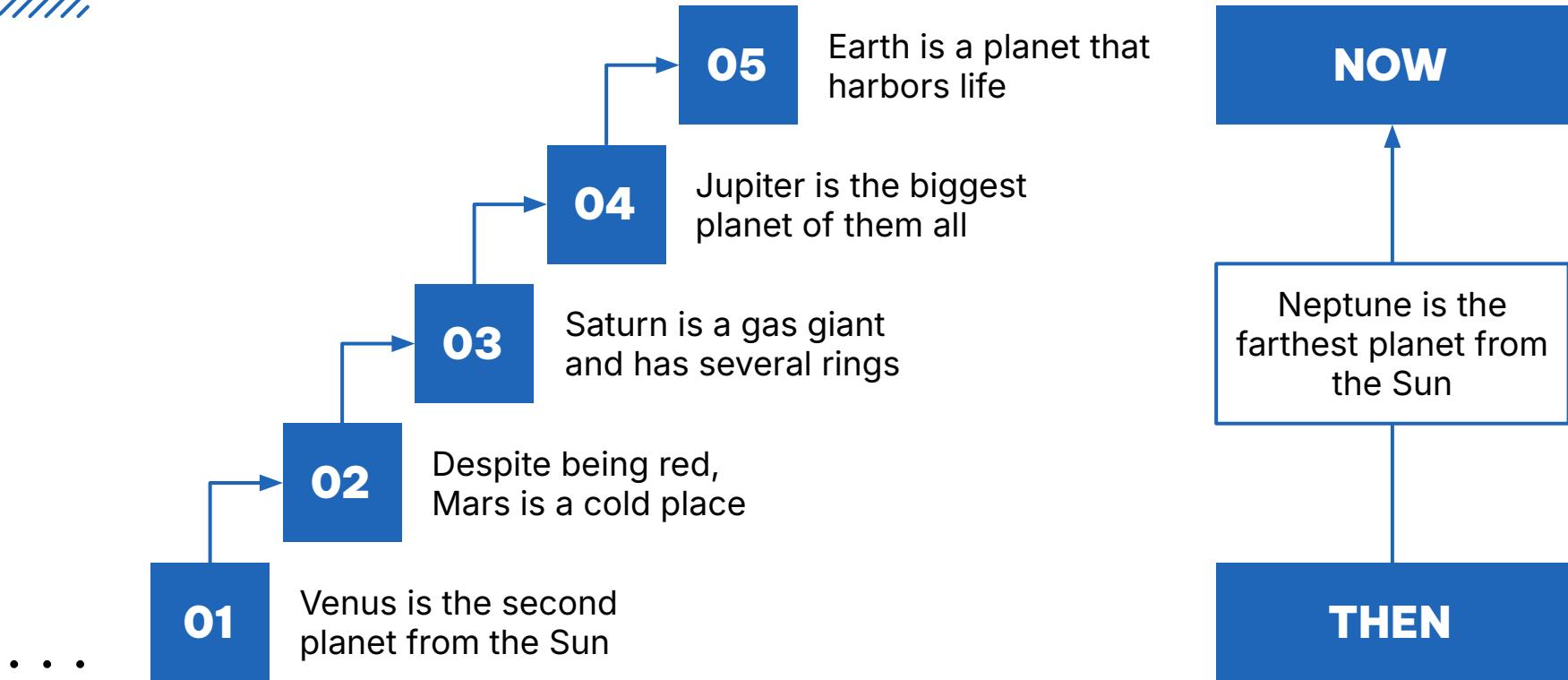
Follow the link in the graph to modify its data and then paste the new one here. [For more info, click here](#)



OUR PRICING

LEVEL 1	LEVEL 2	LEVEL 3
<ul style="list-style-type: none">Mercury is the closest planet to the SunMercury is the smallest planet of them all	<ul style="list-style-type: none">Venus is the second planet from the SunVenus is extremely hot, even more than Mercury	<ul style="list-style-type: none">Despite being red, Mars is a cold placeDespite being red, Mars is actually a cold place
\$50	\$100	\$125

WHAT'S NEXT?



CONFERENCE HIGHLIGHTS

01

MERCURY

Mercury is the closest planet to the Sun

02

VENUS

Venus is the second planet from the Sun

03

JUPITER

Jupiter is the biggest planet in the Solar System

04

SATURN

Saturn is composed of hydrogen and helium

05

NEPTUNE

Neptune is the farthest planet from the Sun



OUR FUTURE CONFERENCES

NOVEMBER

MON	TUE	WED	THU	FRI	SAT	SUN
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

■ VENUS

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

■ MERCURY

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



: : : : :

: : : : :

THANKS TO ALL OUR SPONSORS

Jupiter is a gas giant and the biggest planet in the Solar System. It's the fourth-brightest object in the night sky. It was named after the Roman god of the skies and lightning

LOGO 1

LOGO 2

LOGO 3



TABLE OF CONTENTS



MERCURY

Mercury is the closest planet to the Sun



VENUS

Venus is the second planet from the Sun



MARS

Despite being red, Mars is actually a very cold place



JUPITER

Jupiter is the biggest planet in the Solar System



SATURN

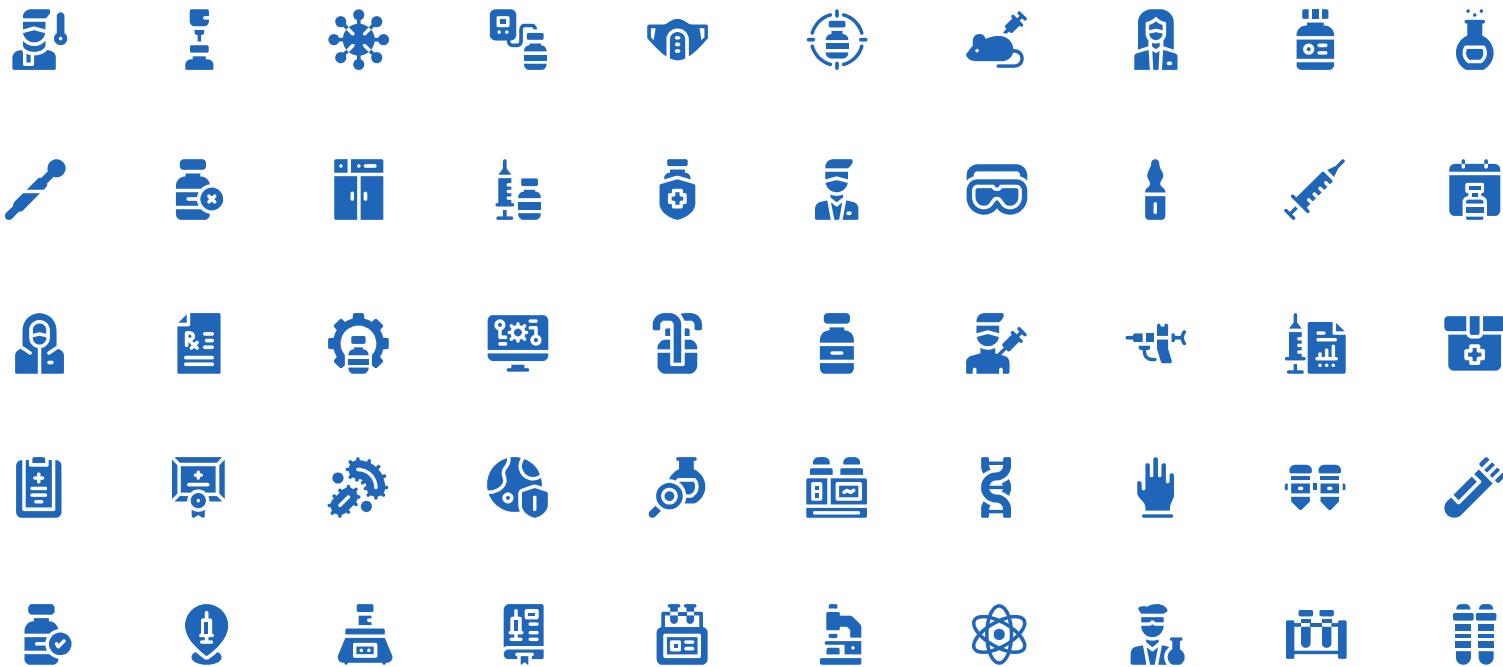
Saturn is composed of hydrogen and helium

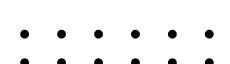


NEPTUNE

Neptune the farthest planet from the Sun

ICON PACK

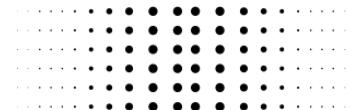
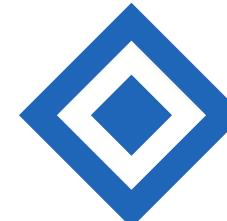
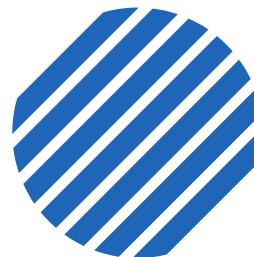




ALTERNATIVE RESOURCES

Here's an assortment of alternative resources whose style fits that of this template:

- Abstract background



RESOURCES

Did you like the resources used in this template? Get them on these websites:

ICONS

- [Icon Pack: Vaccination | Filled](#)

VECTORS

- [Flat design ophthalmologist facebook post](#)

PHOTOS

- [Doctor preparing for consult](#)
- [Serious doctor working](#)
- [Close up on doctor getting ready for work](#)

- [Medium shot doctor with stethoscope](#)
- [Different doctors doing a surgical procedure on a patient](#)
- [Front view smiley doctor holding notebook](#)
- [Smiling asian doctor with stethoscope and folder](#)
- [Front view smiley doctor holding notebook](#)
- [Front view asian doctor with lab coat](#)
- [Male nurse working at the clinic](#)
- [Coronavirus sample procedure](#)
- [Front view smiley doctor at work](#)
- [Medium shot smiley doctor wearing coat](#)

⋮ ⋮ ⋮

⋮ ⋮ ⋮

Storyset

Create your Story with our illustrated concepts. Choose the style you like the most, edit its colors, pick the background and layers you want to show and bring them to life with the animator panel! It will boost your presentation. Check out [how it works](#).



Pana



Amico



Bro



Rafiki

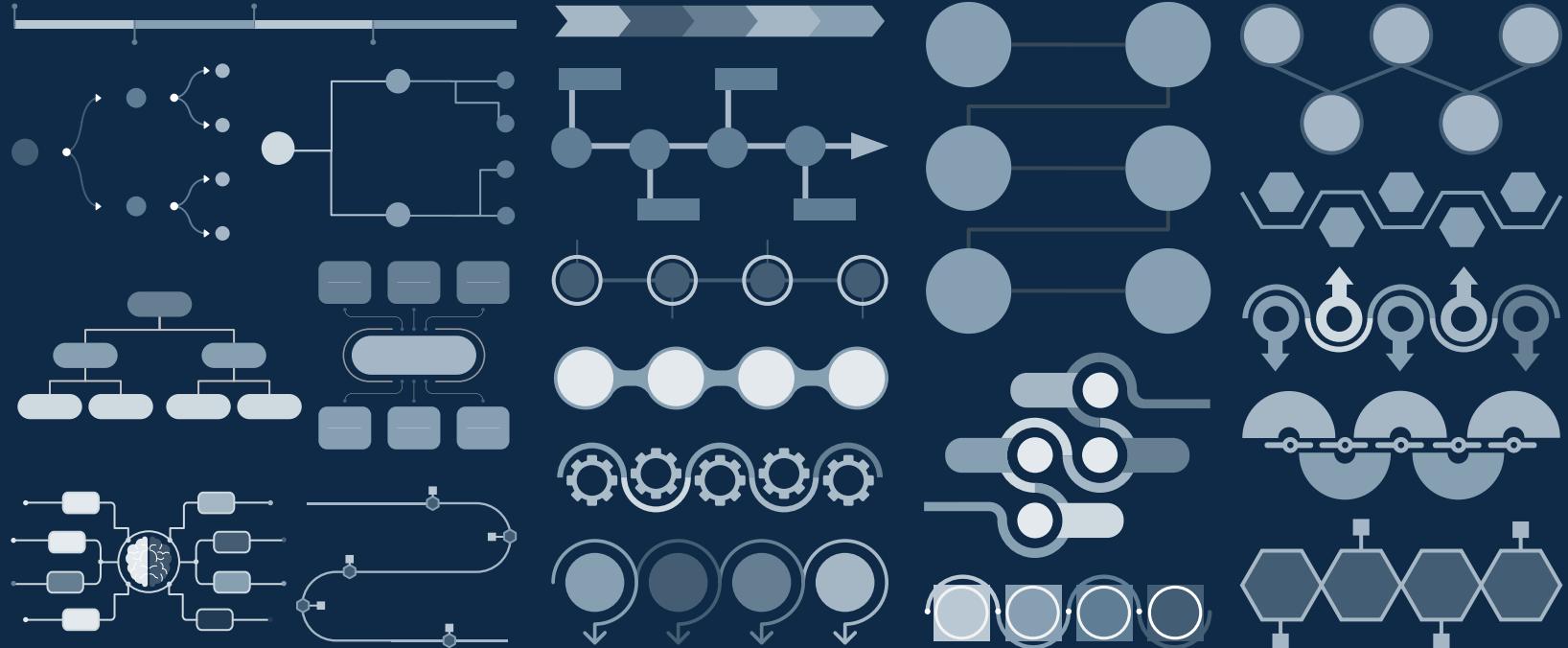


Cuate

Use our editable graphic resources...

You can easily **resize** these resources without losing quality. To **change the color**, just ungroup the resource and click on the object you want to change. Then, click on the paint bucket and select the color you want. Group the resource again when you're done. You can also look for more **infographics** on Slidesgo.





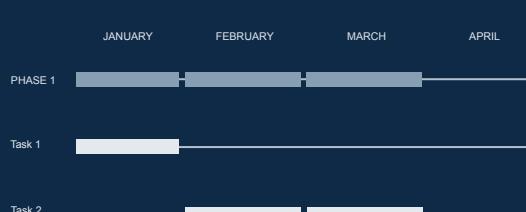
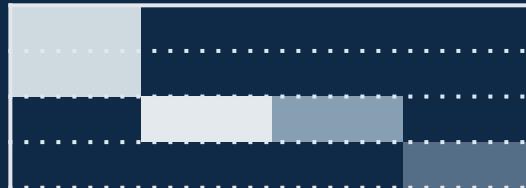
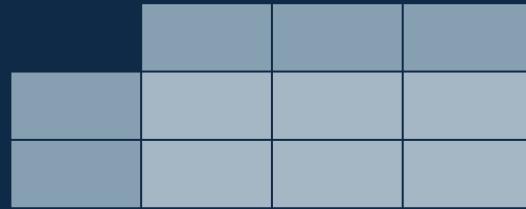
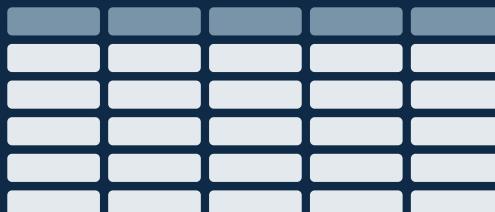
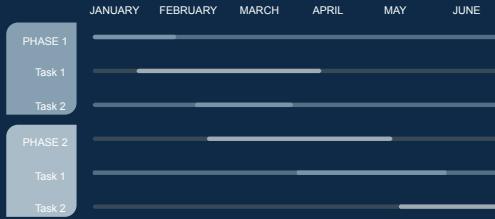
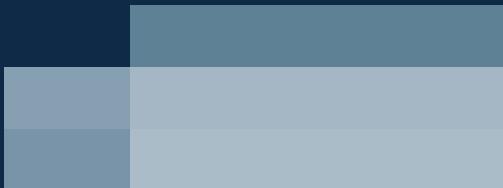
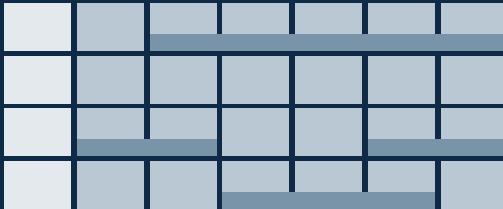
...and our sets of editable icons

You can **resize** these icons without losing quality.

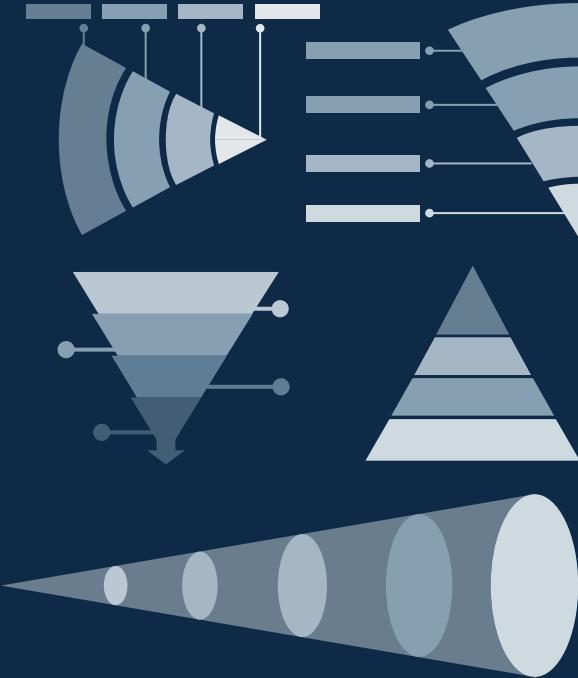
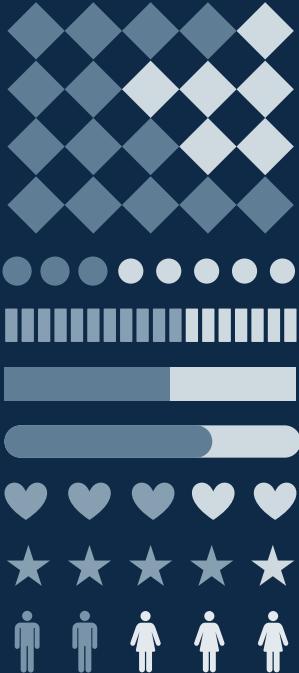
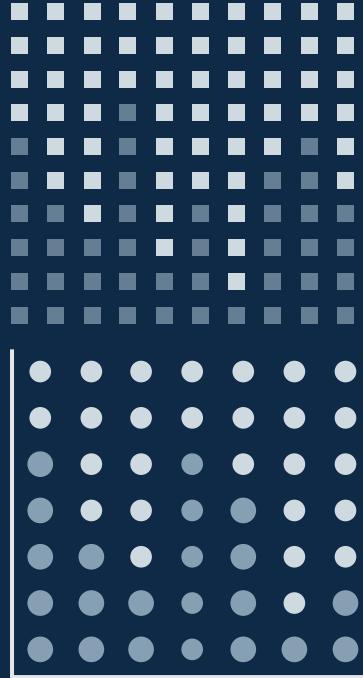
You can change the stroke and fill color; just select the icon and click on the paint bucket/pen.

In Google Slides, you can also use Flaticon's extension, allowing you to customize and add even more icons.









Educational Icons



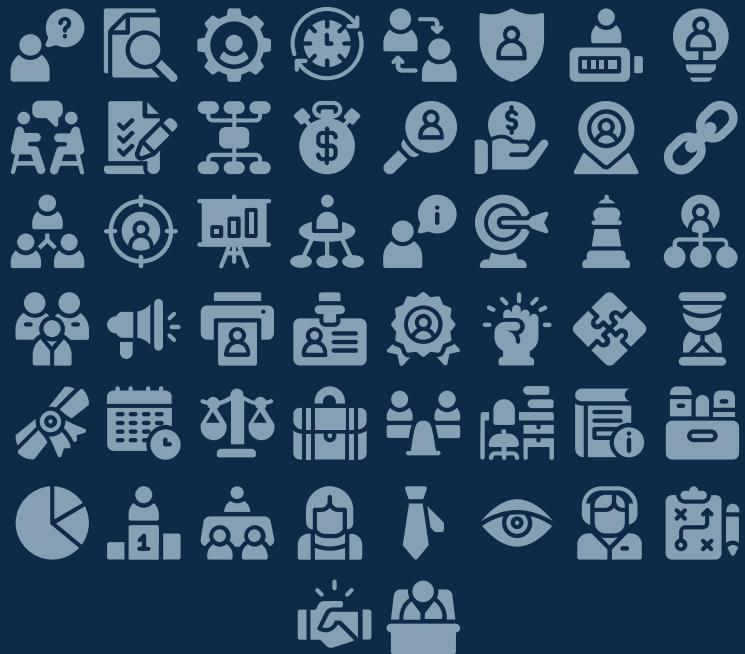
Medical Icons



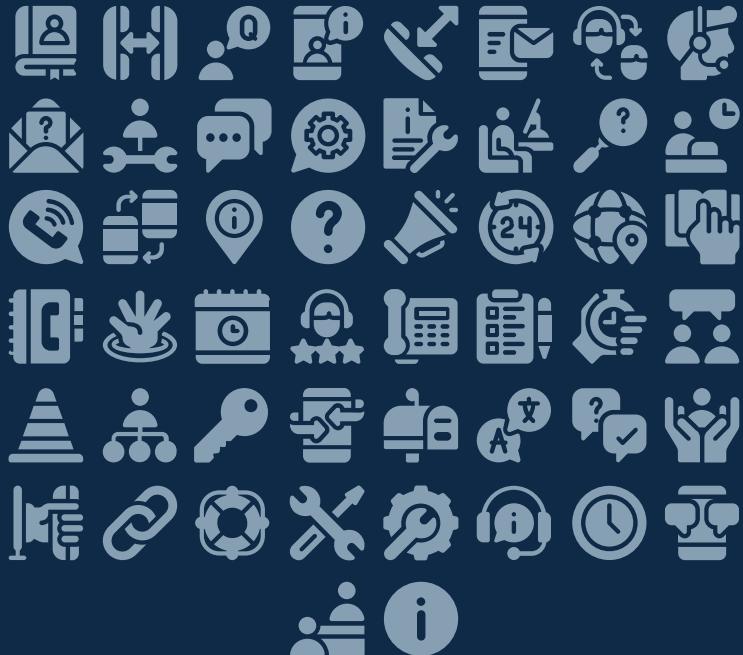
Business Icons



Teamwork Icons



Help & Support Icons



Avatar Icons



Creative Process Icons



Performing Arts Icons



