

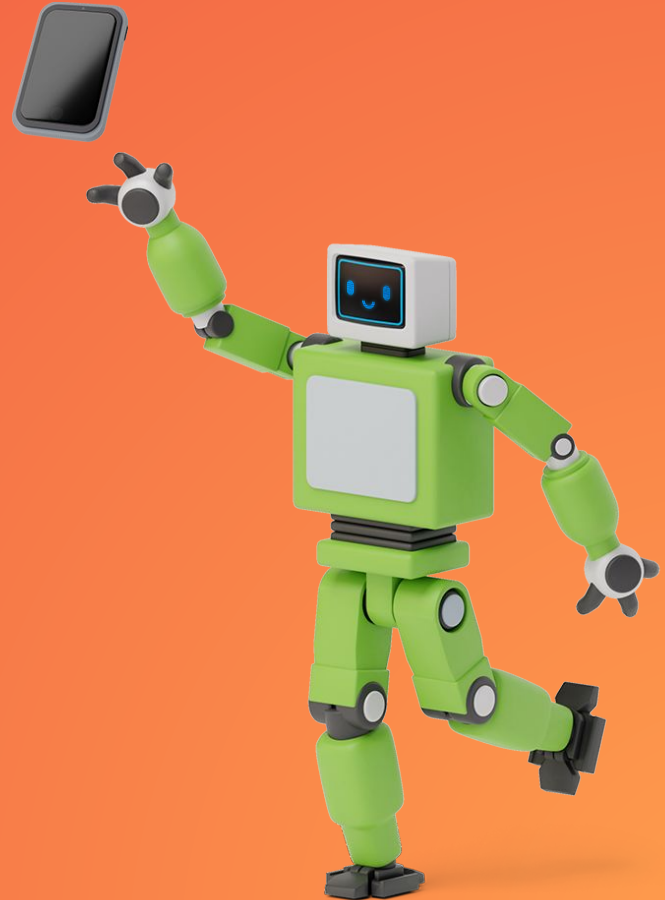
EECS/BIOE/ME
106A/206A

LABS 3 & 4



ANNOUNCEMENTS + REMINDERS

- **If you aren't feeling well, don't come to lab**
 - Be respectful to everyone
 - No food/drink in the lab
 - Keep your stations clean
 - Don't work in the lab alone
-
- **Ctrl + C** out of all terminals before leaving
 - Use `pkill -u [username]` to log out



ROADMAP

Last Week (9/4-9/8)

Lab 2

1

This Week (9/11-9/15)

Lab 2 Due

Start Labs 3 and 4

2

Next Week (9/18-9/22)

Continue Labs 3 and 4

3

Two Weeks (9/25-9/29)

Buffer Week Labs 3 and 4

4

You must get checked off for Lab 2 before working on Labs 3 or 4!

You must have completed the Robot Usage Quiz before starting!³

GENERAL ROBOT RESPONSIBILITY

DO:

- **DO** be aware of your surroundings
- **DO** test code in simulation before running it! (if applicable)
- **DO** ask a staff member if you're ever unsure of how to do something!

DON'T:

- **DON'T** make hardware modifications!
- **DON'T** close a terminal without pressing Ctrl+C!
- **DON'T** use robots without a partner!



SAWYER RESPONSIBILITY

DO:

- **DO** be ready to press the E-Stop at a moment's notice so the robot doesn't crash into anything
- **DO** hold the robot arm by the cuff when moving it manually (zero-g) mode
- **DO** be especially careful when handling these robots

DON'T:

- **DON'T** manually move the robot except when holding the cuffs
- **DON'T** get too close to the Sawyer robots!



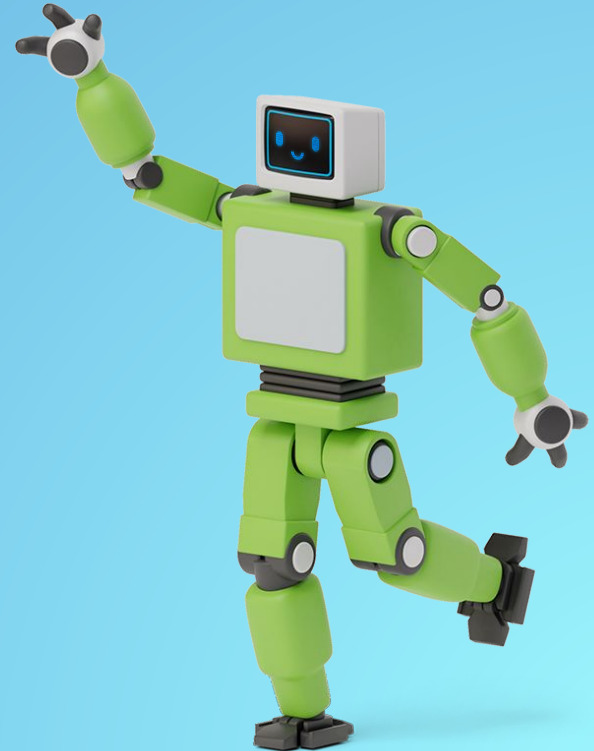
TURTLEBOT RESPONSIBILITY

DO:

- **DO** make sure you're using the correct TurtleBot for your workstation
- **DO** be careful with TurtleBots on the floor!
- **DO** plug in and turn off the TurtleBots when charging

DON'T:

- **DON'T** leave the TurtleBots on the floor after you have finished
- **DON'T** leave the TurtleBots uncharged



LAB 3

Forward Kinematics/Coordinate
Transformations



GOALS

- Practice computing forward kinematics maps
- Show that your FK implementation matches ROS
- Leverage the powerful functionality of tf2
- Control Sawyer to joint-position goals



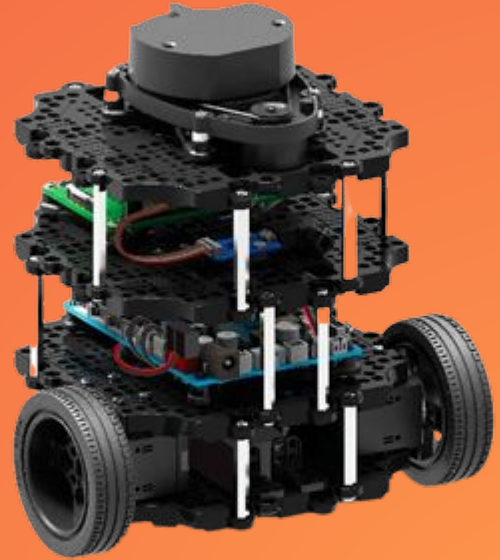
LAB 4

Introduction to TurtleBot



GOALS

- Bringup and control a TurtleBot from keyboard
- Perform SLAM and navigate in the map
- Track the TurtleBot's ARTag with a camera
- Make a TurtleBot track a second ARTag



IMPORTANT INFORMATION

Lab 3:

- Must do pre-lab from HW!
 - Otherwise, this lab will be very painful!
- The `/intera.sh` scripts produce a lot of output - safe to ignore
- Print out your initial joint angles before moving the arm to a different position
- Press the E-Stop immediately if anything looks like it's about to go wrong

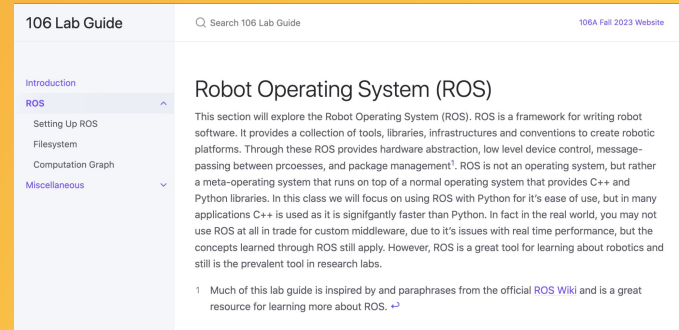
Lab 4:

- Only have one TurtleBot controller (keyboard OR custom) running at a time
 - Otherwise, the two controllers will send conflicting commands!
- Positive X on ARTag is NOT positive X (forwards) on the TurtleBot
 - The lab doc accounts for this already :)
- Pay attention to which commands should be run via SSH vs on workstation
- Turn the TurtleBot off and on again if it's not connecting

LAB USAGE GUIDE IS RELEASED!

<https://ucb-ee106.github.io/lab-guide/>

Very helpful if you have specific questions about lab concepts – goes a lot more in depth than the lab doc!



ANY QUESTIONS?

Help/Checkoff form:

tinyurl.com/fa23-106alab



INSTRUCTIONS FOR USE

EDIT IN GOOGLE SLIDES

Click on the button under the presentation preview that says **"Use as Google Slides Theme"**.

You will get a copy of this document on your Google Drive and will be able to edit, add or delete slides.

You have to be signed in to your Google account.

More info on how to use this template at
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EDIT IN POWERPOINT®

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Remember to download and install the fonts used in this presentation (you'll find the links to the font files needed in the [Presentation design slide](#))





HELLO!

I am Jayden Smith

I am here because I love to give presentations.

You can find me at @username

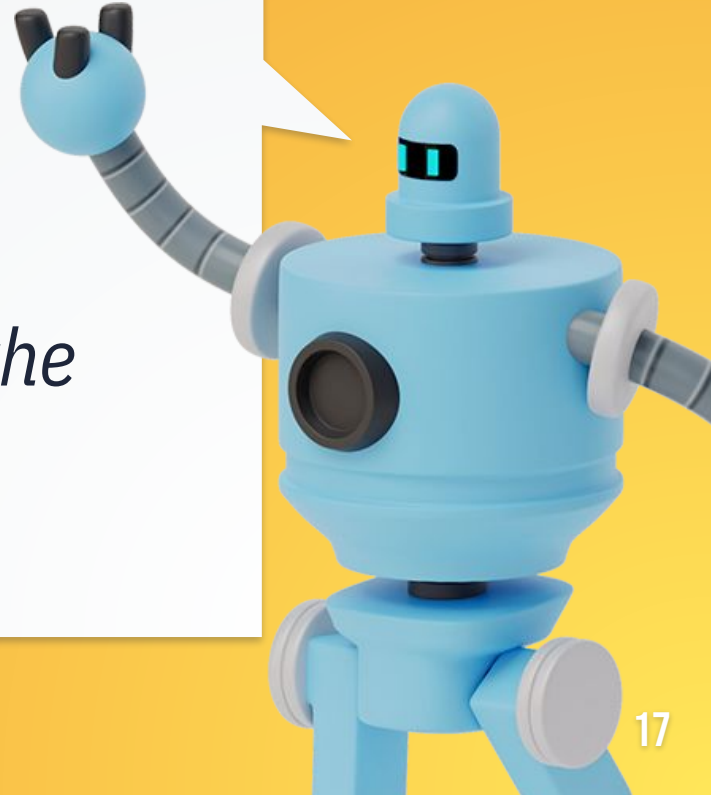


TRANSITION HEADLINE

Let's start with the first set of slides



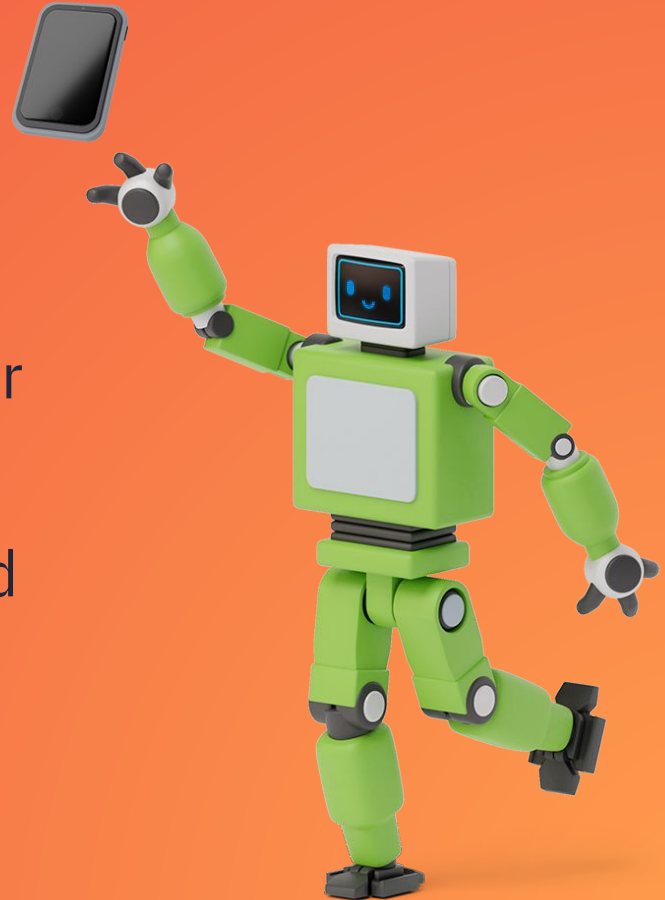
“Quotations are commonly printed as a means of inspiration and to invoke philosophical thoughts from the reader”.



THIS IS A SLIDE TITLE

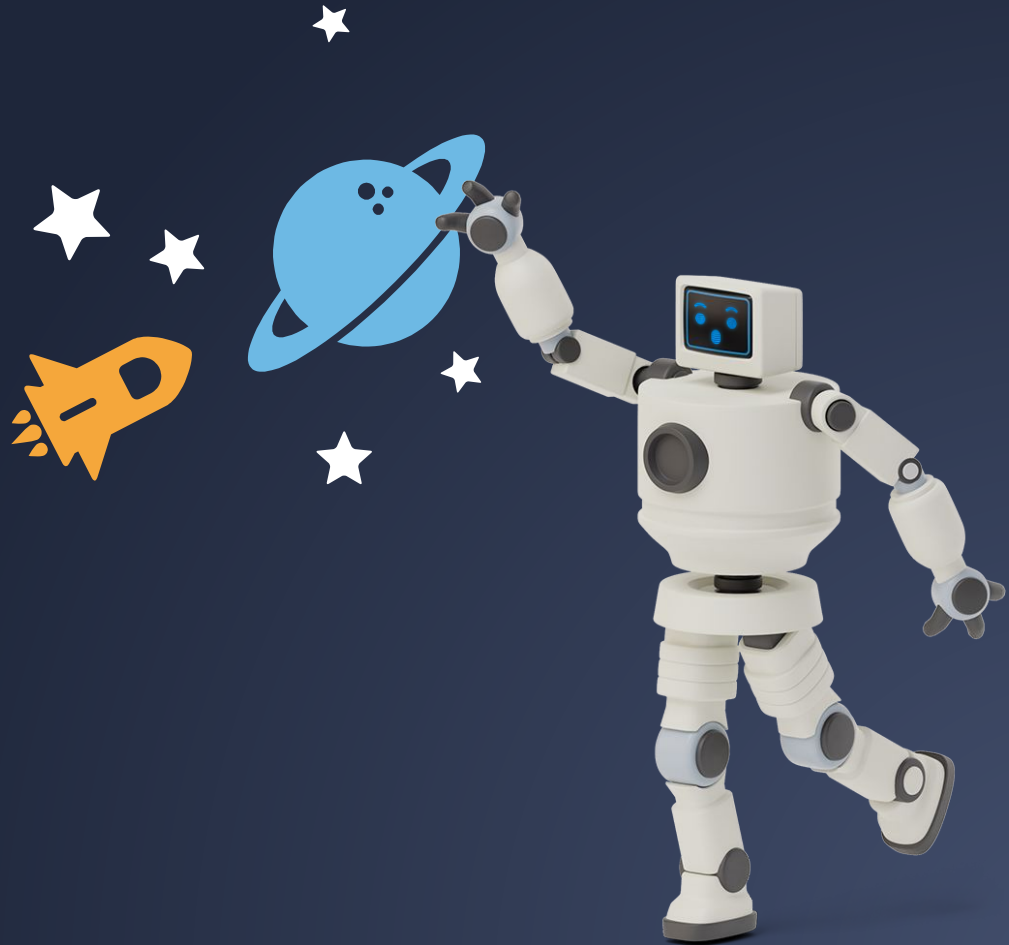
- Here you have a list of items
- And some text
- But remember not to overload your slides with content

Your audience will listen to you or read the content, but won't do both.



BIG CONCEPT

Bring the attention of your audience over a key concept using icons or illustrations



YOU CAN ALSO SPLIT YOUR CONTENT

White

Is the color of milk and fresh snow, the color produced by the combination of all the colors of the visible spectrum.

Black

Is the color of ebony and of outer space. It has been the symbolic color of elegance, solemnity and authority.



IN TWO OR THREE COLUMNS

Yellow

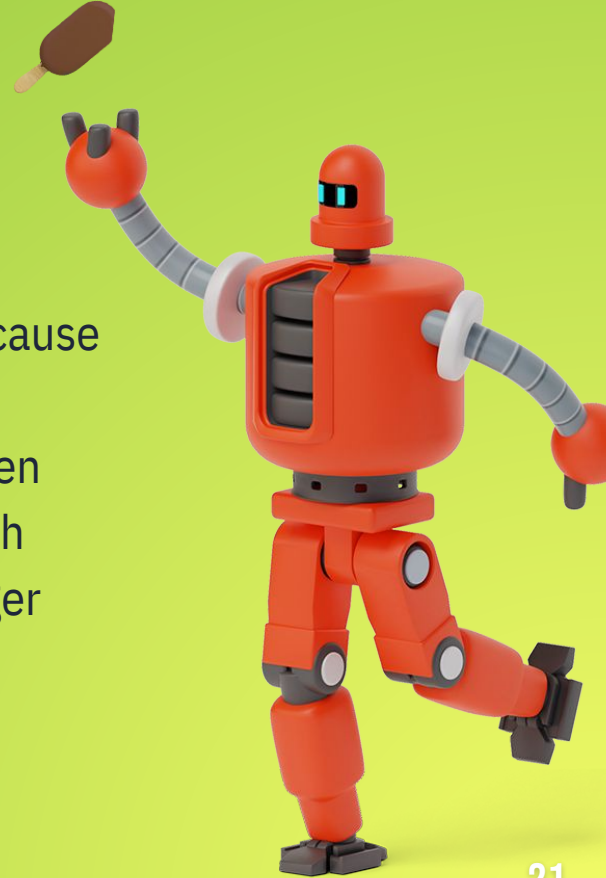
Is the color of gold, butter and ripe lemons. In the spectrum of visible light, yellow is found between green and orange.

Blue

Is the colour of the clear sky and the deep sea. It is located between violet and green on the optical spectrum.

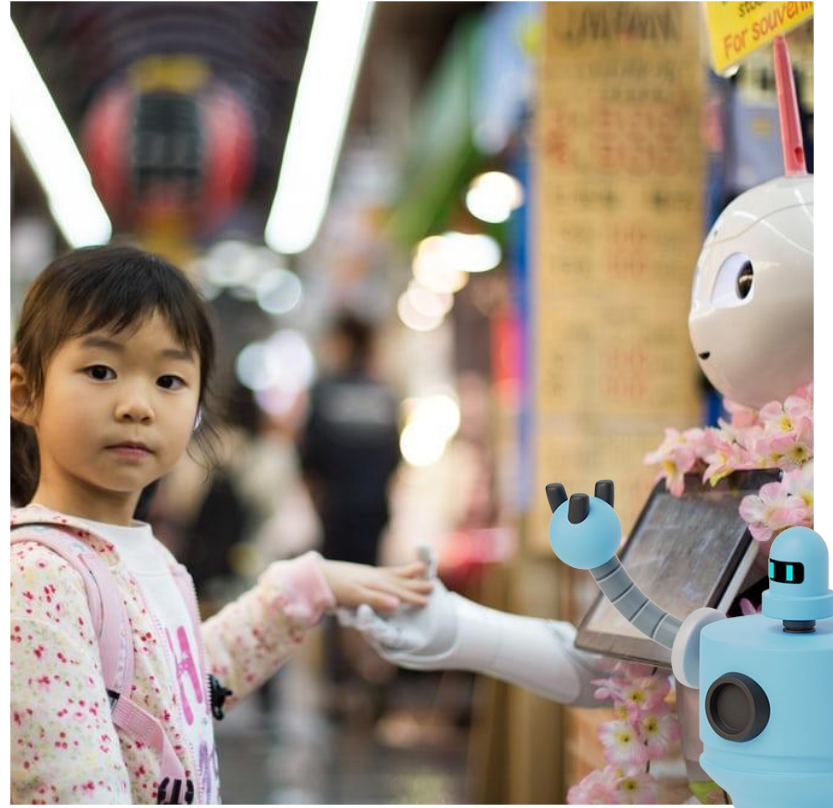
Red

Is the color of blood, and because of this it has historically been associated with sacrifice, danger and courage.



A PICTURE IS WORTH A THOUSAND WORDS

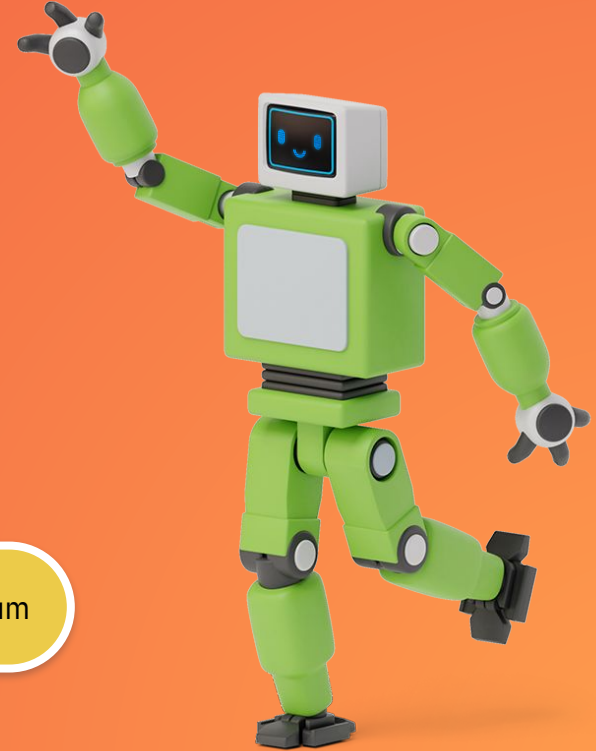
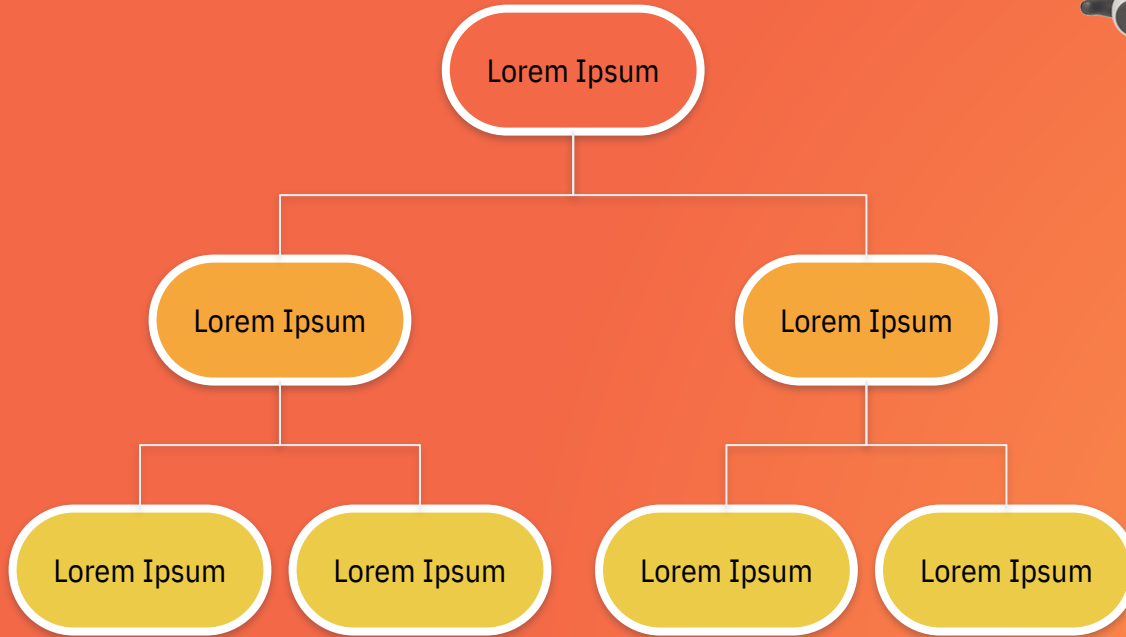
A complex idea can be conveyed with just a single still image, namely making it possible to absorb large amounts of data quickly.





**WANT BIG IMPACT?
USE BIG IMAGE.**

USE DIAGRAMS TO EXPLAIN YOUR IDEAS



AND TABLES TO COMPARE DATA

	A	B	C
Yellow	10	20	7
Blue	30	15	10
Orange	5	24	16

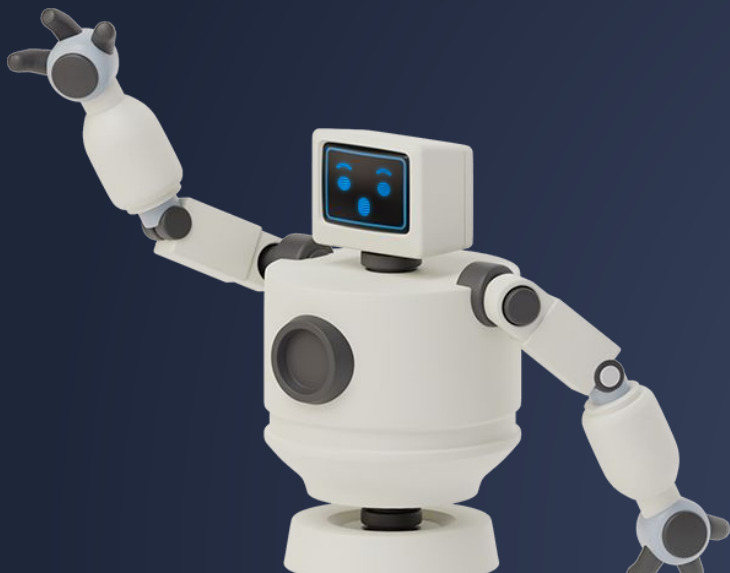


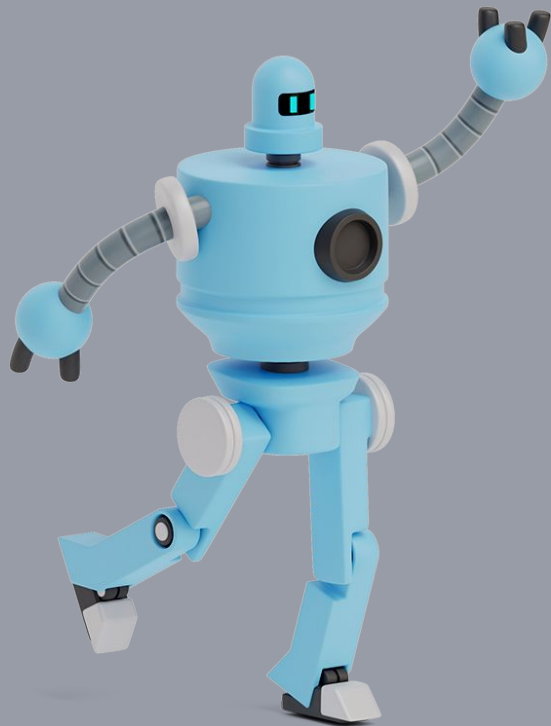
MAPS



89,526,124

Whoa! That's a big number, aren't you proud?

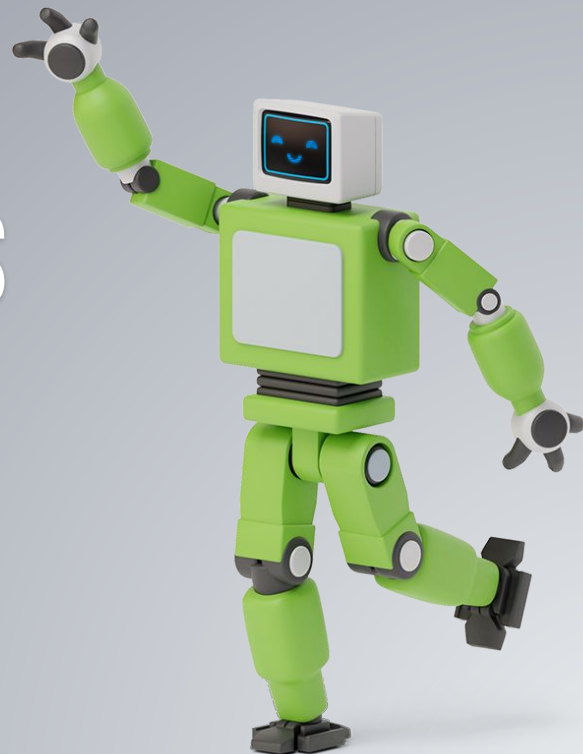




89,526,124\$
That's a lot of money

185,244 USERS
And a lot of users

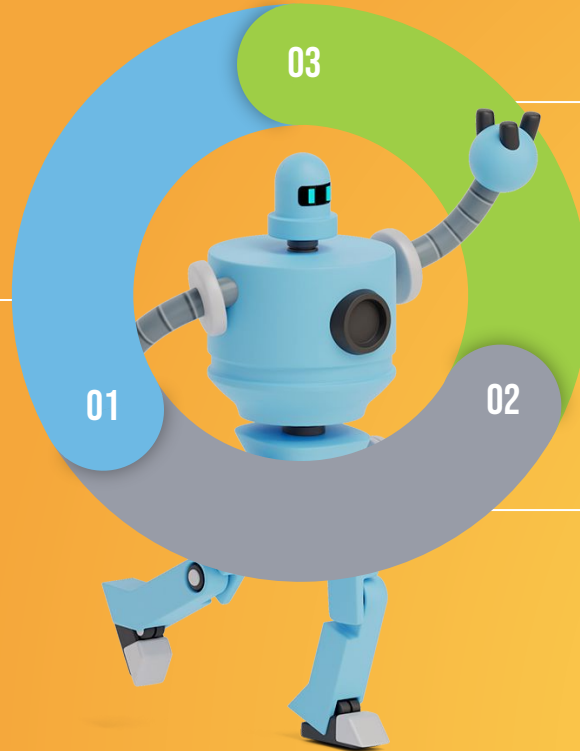
100%
Total success!



OUR PROCESS IS EASY

Vestibulum congue tempus

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor. Donec facilisis lacus eget mauris.



Vestibulum congue tempus

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor. Donec facilisis lacus eget mauris.

Vestibulum congue tempus

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor. Donec facilisis lacus eget mauris.

LET'S REVIEW SOME CONCEPTS

Yellow

Is the color of gold, butter and ripe lemons. In the spectrum of visible light, yellow is found between green and orange.

Yellow

Is the color of gold, butter and ripe lemons. In the spectrum of visible light, yellow is found between green and orange.

Blue

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Blue

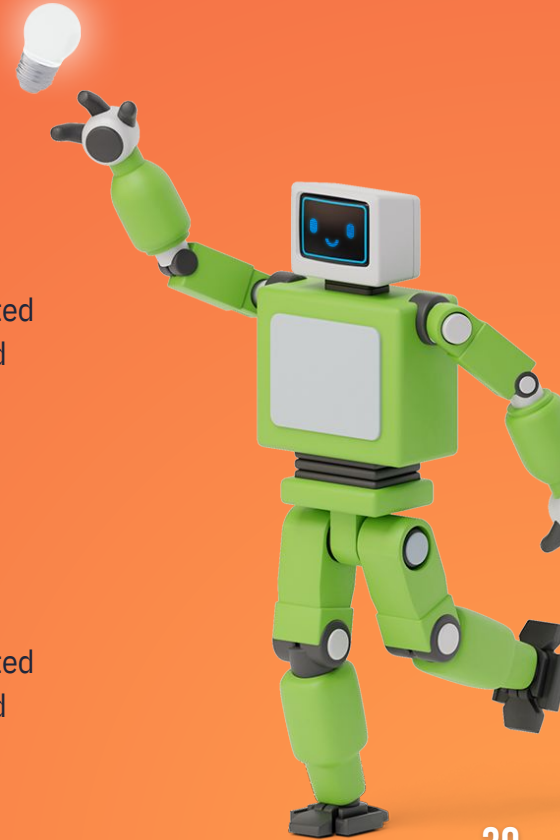
Is the colour of the clear sky and the deep sea. It is located between violet and green on the optical spectrum.

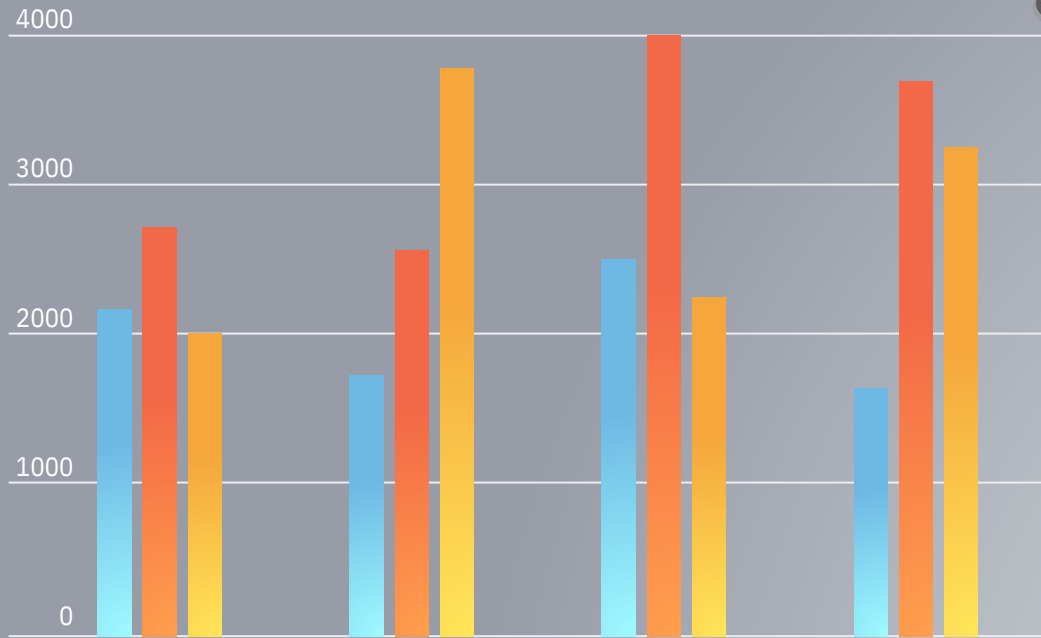
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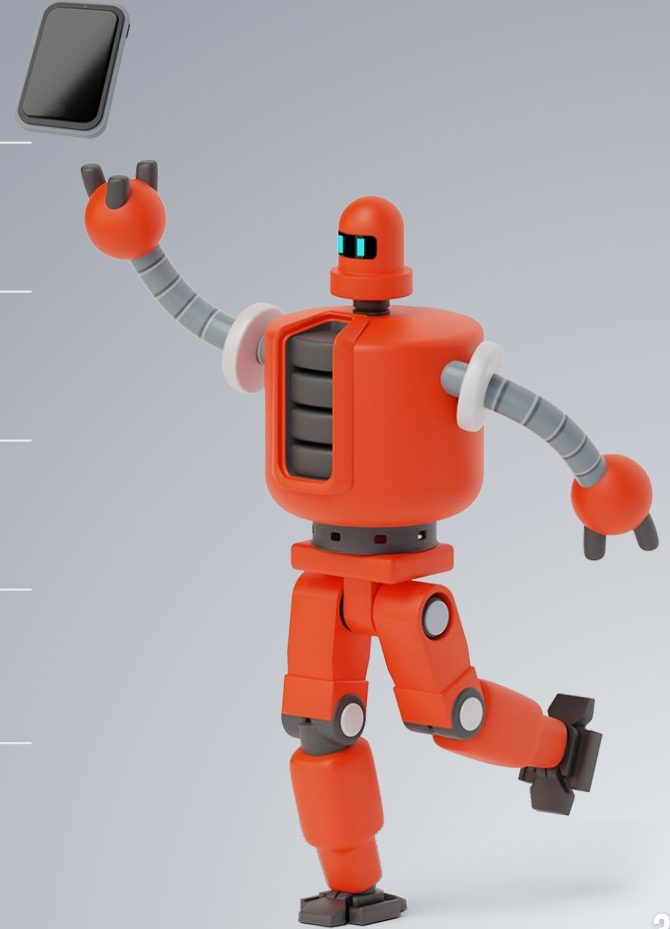
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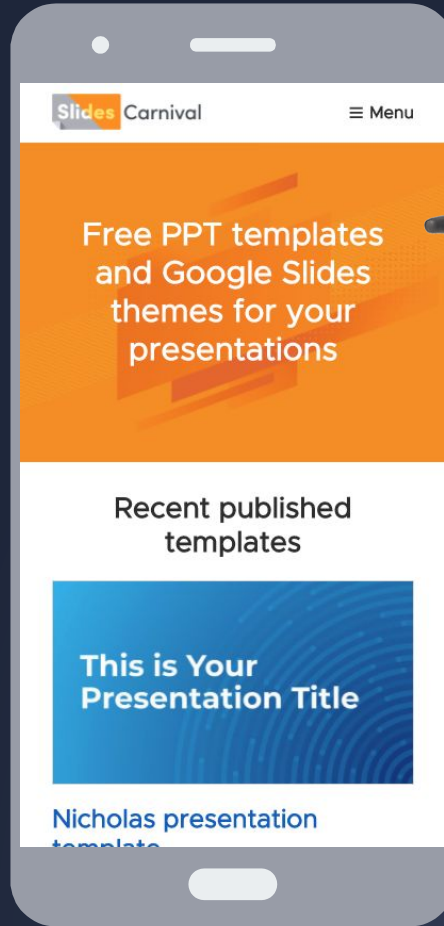


You can insert graphs from Excel or Google Sheets



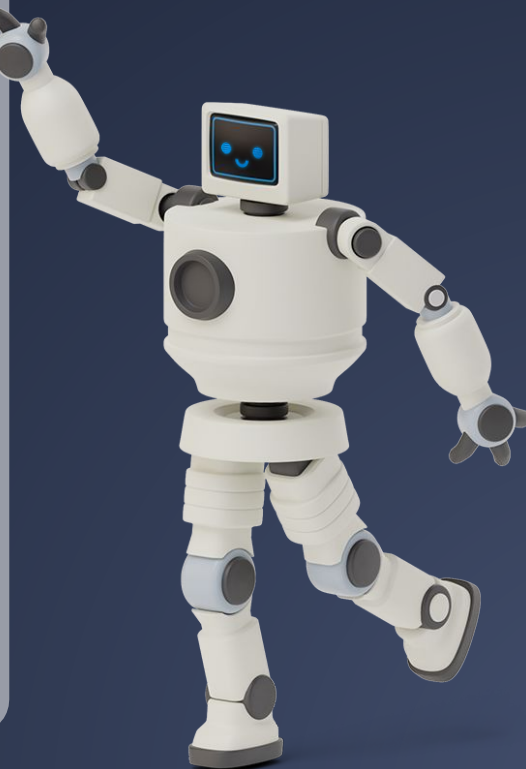
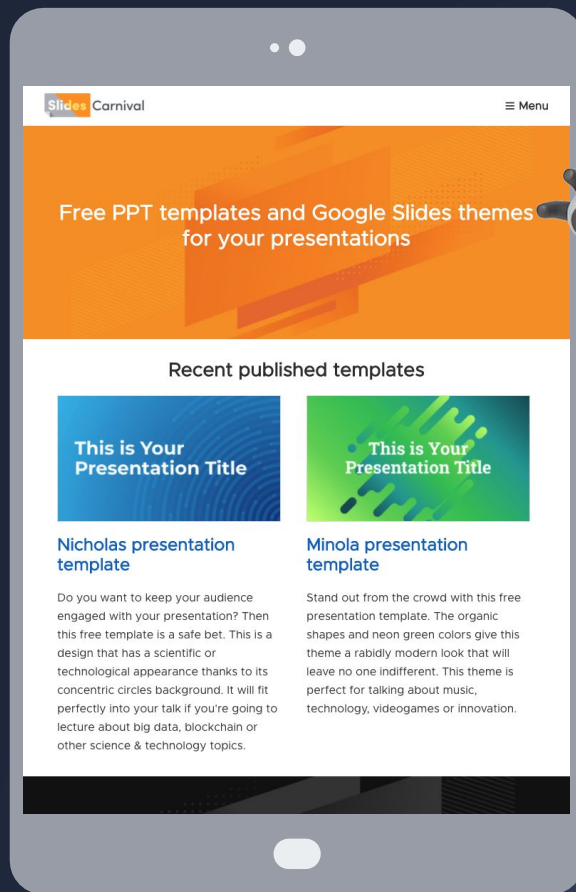
MOBILE PROJECT

Show and explain your web, app or software projects using these gadget templates.



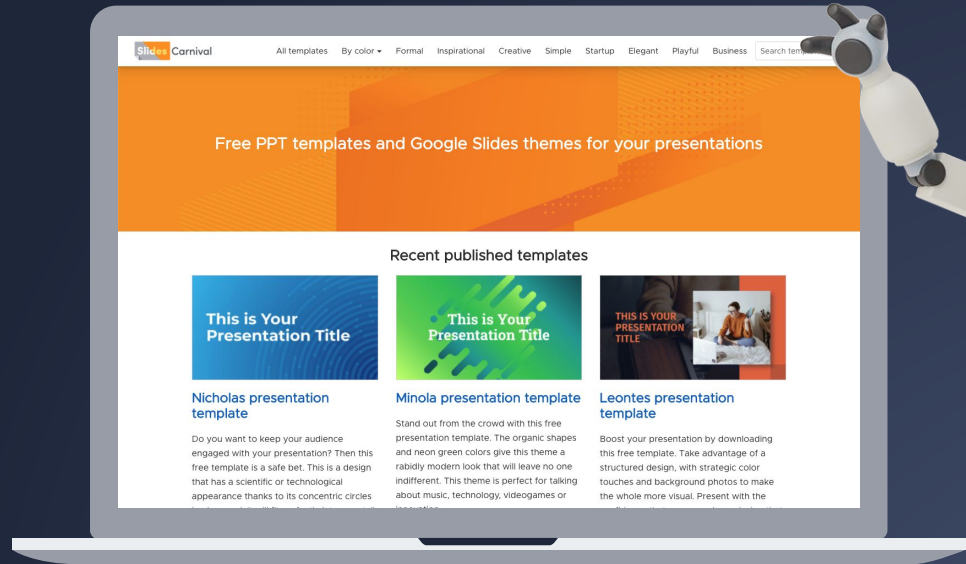
TABLET PROJECT

Show and explain your web, app or software projects using these gadget templates.



DESKTOP PROJECT

Show and explain your web, app or software projects using these gadget templates.



ANY QUESTIONS?

You can find me at:

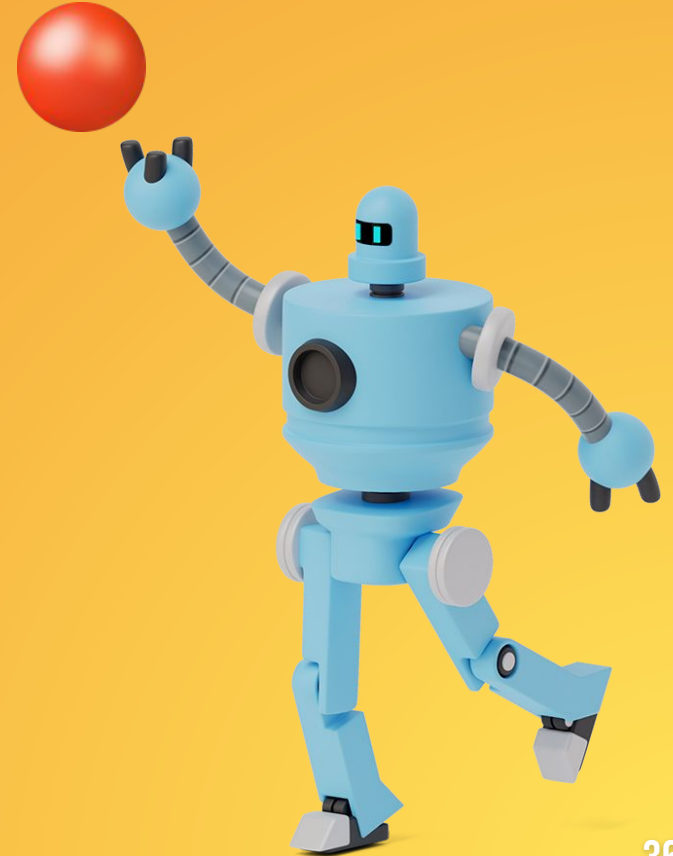
- @username
- user@mail.me



CREDITS

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- Presentation template by [SlidesCarnival](#)
- Robots by [Alex Monge](#)
- Photographs by [Unsplash](#)



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This presentation uses the following typographies:

- Titles: Bebas Neue
- Body copy: IBM Plex Sans Condensed

Download for free at:

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<https://github.com/IBM/plex/releases/tag/v5.1.3>

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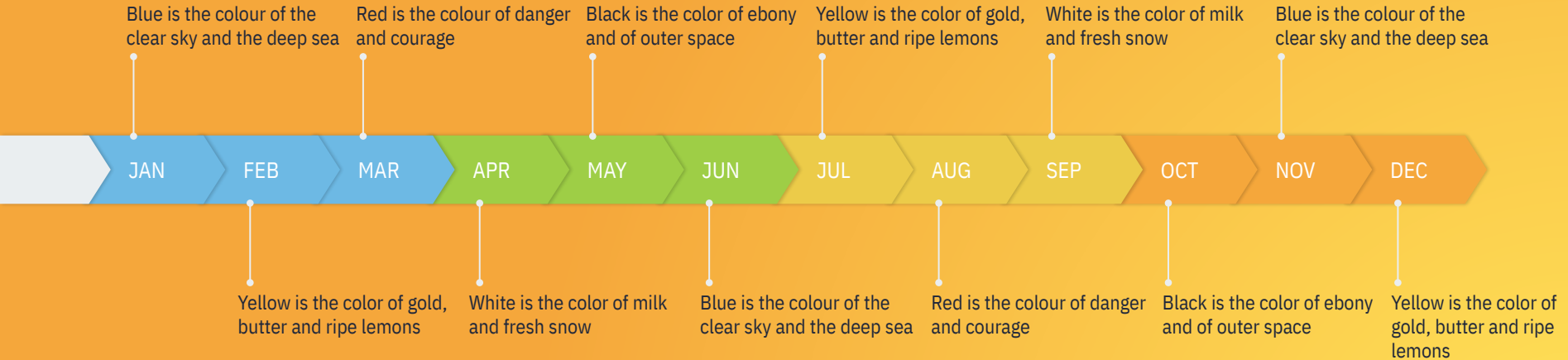


EXTRA RESOURCES

For Business Plans, Marketing Plans,
Project Proposals, Lessons, etc



TIMELINE



ROADMAP

Blue is the colour of the
clear sky and the deep sea

1

Red is the colour of danger
and courage

3

Black is the color of ebony
and of outer space

5

Yellow is the color of gold,
butter and ripe lemons

2

White is the color of milk
and fresh snow

4

Blue is the colour of the
clear sky and the deep sea

6

GANTT CHART

		Week 1							Week 2						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Task 1															
Task 2															
Task 3															
Task 4															
Task 5															
Task 6															
Task 7															
Task 8															

SWOT ANALYSIS

STRENGTHS

Blue is the colour of the clear sky and the deep sea

S

WEAKNESSES

Yellow is the color of gold, butter and ripe lemons

W

Black is the color of ebony and of outer space

OPPORTUNITIES










O

White is the color of milk and fresh snow

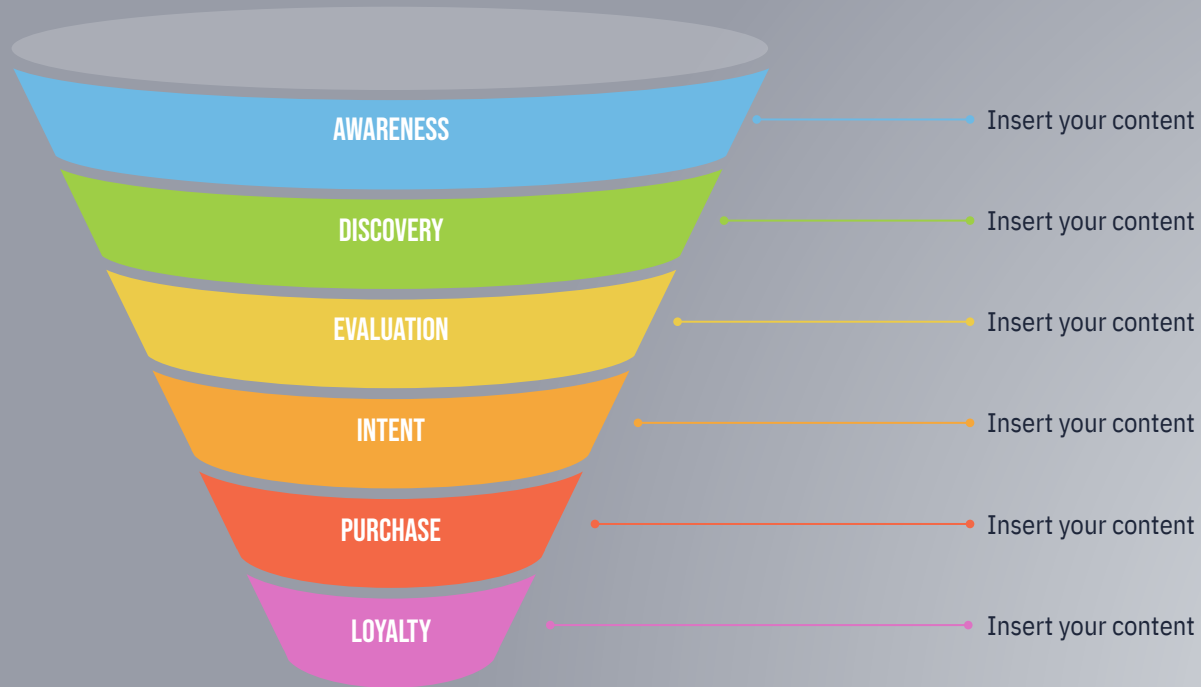
THREATS

T

BUSINESS MODEL CANVAS

<div><div>Key Partners</div><div>Insert your content</div></div> <div></div>	<div><div>Key Activities</div><div>Insert your content</div></div> <div></div>	<div><div>Value Propositions</div><div>Insert your content</div></div> <div></div>	<div><div>Customer Relationships</div><div>Insert your content</div></div> <div></div>	<div><div>Customer Segments</div><div>Insert your content</div></div> <div></div>	
<div><div>Key Resources</div><div>Insert your content</div></div> <div></div>	<div><div>Channels</div><div>Insert your content</div></div> <div></div>	<div><div>Cost Structure</div><div>Insert your content</div></div> <div></div>			<div><div>Revenue Streams</div><div>Insert your content</div></div> <div></div>

FUNNEL



TEAM PRESENTATION



Imani Jackson

JOB TITLE

Blue is the colour of the clear
sky and the deep sea



Marcos Galán

JOB TITLE

Blue is the colour of the clear
sky and the deep sea



Ixchel Valdía

JOB TITLE

Blue is the colour of the clear
sky and the deep sea

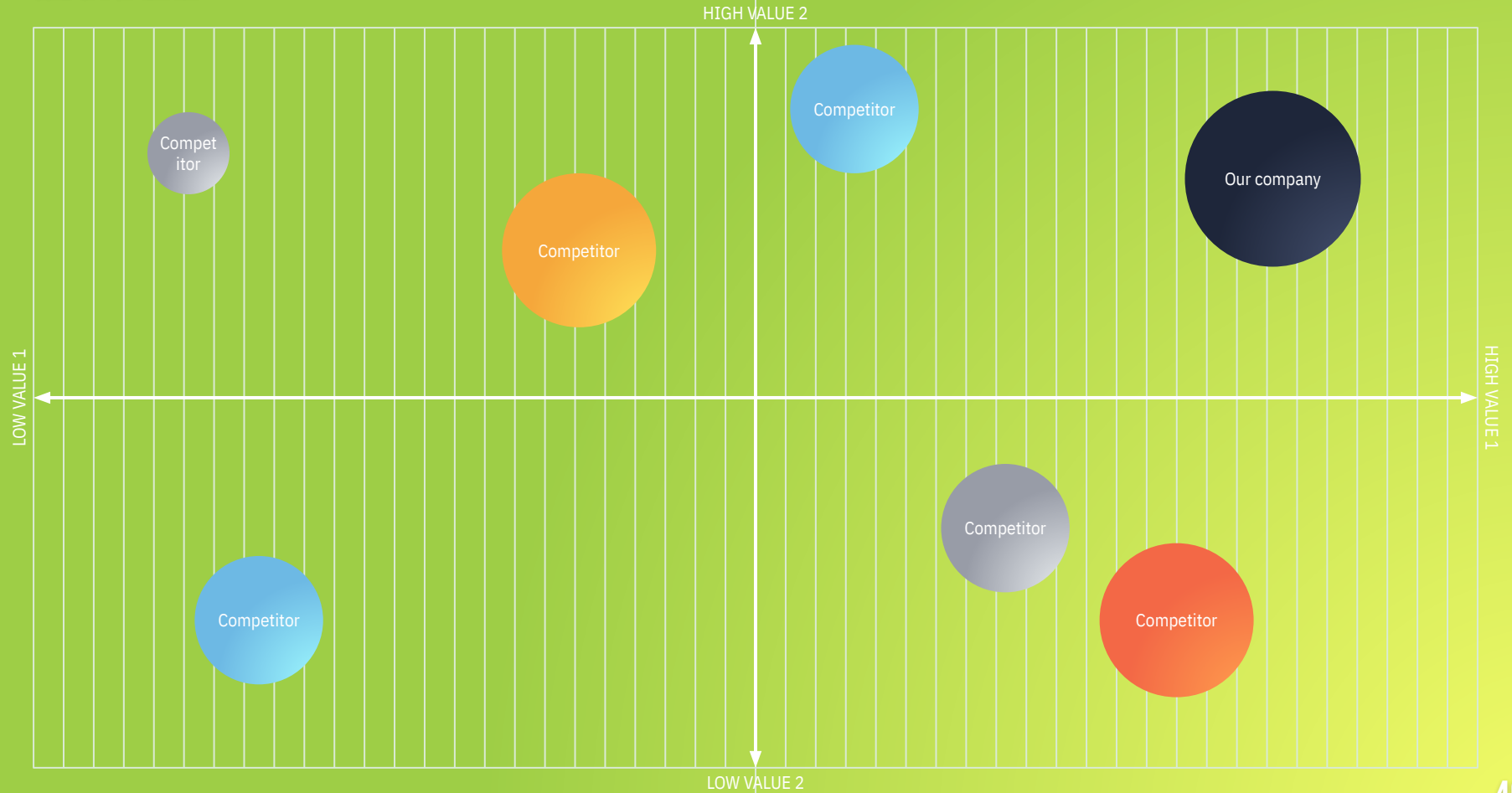


Nils Årud

JOB TITLE

Blue is the colour of the clear
sky and the deep sea

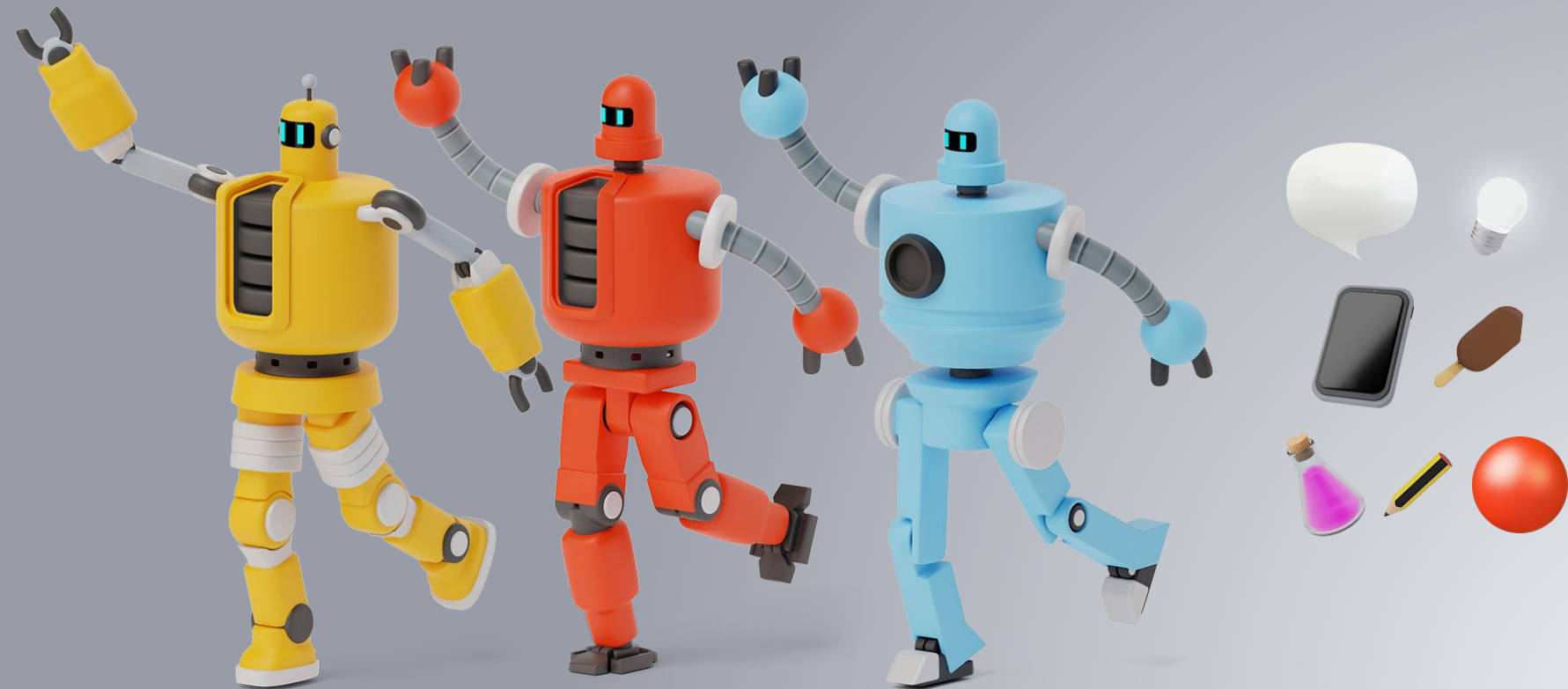
COMPETITOR MATRIX



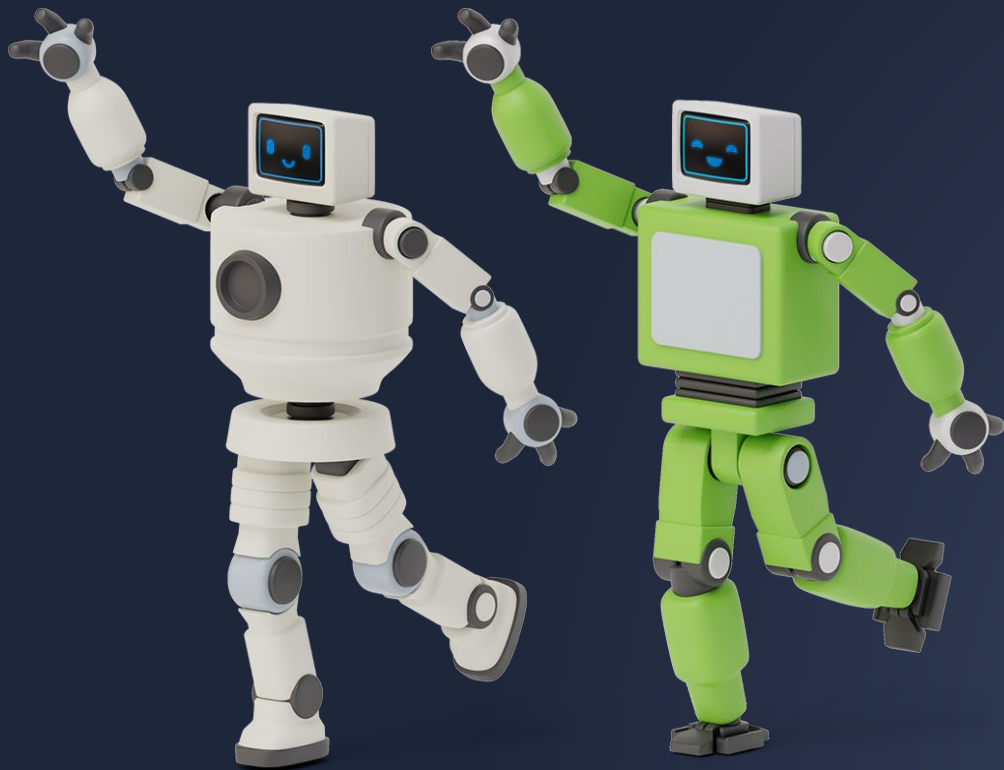
WEEKLY PLANNER

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
09:00 - 09:45	Task	Task	Task	Task	Task	Task	Task
10:00 - 10:45	Task	Task	Task	Task	Task	Task	Task
11:00 - 11:45	Task	Task	Task	Task	Task	Task	Task
12:00 - 13:15	✓ Free time	✓ Free time	✓ Free time	✓ Free time	✓ Free time	✓ Free time	✓ Free time
13:30 - 14:15	Task	Task	Task	Task	Task	Task	Task
14:30 - 15:15	Task	Task	Task	Task	Task	Task	Task
15:30 - 16:15	Task	Task	Task	Task	Task	Task	Task

EXTRA RESOURCES



EXTRA RESOURCES



Change the faces and have fun!





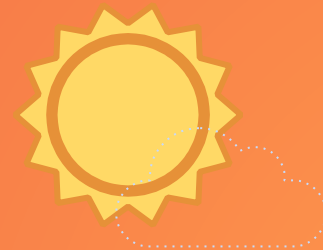
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- Resize them without losing quality.
- Change fill color and opacity.
- Change line color, width and style.

Isn't that nice? :)

Examples:



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DIAGRAMS AND INFOGRAPHICS



You can also use any emoji as an icon!

And of course it resizes without losing quality.

How? Follow Google instructions <https://twitter.com/googledocs/status/730087240156643328>



many more...



Free templates for all your presentation needs



For PowerPoint and
Google Slides



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or commercial use



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professional and
customizable



Blow your audience
away with attractive
visuals