

**DEMYSTIFYING CAPTURE
THE FLAGS (CTF)
BARRETT DARNELL**



OUR AGENDA

01 WHAT IS A CTF?

02 CTF STYLES

03 CHALLENGE TYPES

04 TECHNICAL SKILLS

05 NON-TECHNICAL SKILLS

06 POST CTF ANALYSIS



WHOAMI

- » Security Associate at Bishop Fox
- » Managed Security Services, Continuous Attack Surface Testing (CAST)
- » SANS Instructor in Training, SEC660
- » Previously:
 - Offensive Cyber Operator, US Air Force
 - Certified Operator Trainer
 - Military Instructor
- » Notable Wins

CTF STYLES

- » Jeopardy
- » Attack and Defense
- » King of the Hill
- » Story/Scenario Driven

TYPES OF CHALLENGES

- » Cryptography
- » Computer Exploitation
- » Forensics
- » Programming
- » Reverse Engineering
- » Trivia/Puzzle
- » Web
- » Misc.

TECHNICAL SKILLS, TOOLS AND TECHNIQUES

- » Windows
- » Linux
- » Infrastructure
- » Networking
- » Scripting

TECHNICAL VIGNETTES

» IOT CTF by Independent Security Evaluators (ISE)

- Developed tools, cross compiled binaries, learned about IOT
- Used those skills on assessments to pivot into internal networks

» Malware RE

- Rudimentary RE skills gained through various CTFs
- Used on assessments to examine unknown binaries

NON-TECHNICAL SKILLS

- » Creativity
- » Persistence
- » Resiliency
- » Note Taking, Logging, Analysis
- » Preparation and Practice
- » Attention to Detail

NON-TECHNICAL VIGNETTE

» Geocaching/Escape rooms

- Common techniques, recognizing patterns
- Scratch near a puzzle, timestamp of binaries

» Note taking is critical!

- Terminal screens
- Web requests
- Network traffic
- Proxy logs

SOCIALIZING & TEAMWORK

- » Know your team
- » Learn as a team
- » Leverage the expertise of others
- » Bonding
- » Communicating effectively
- » Knowledge sharing

POST CTF

- » Writeups
- » Video walk throughs
- » Tooling
- » Testing
- » Analysis and self-improvement

CONCLUSION & QUESTIONS

- » What is a CTF?
- » CTF Styles
- » Challenge Types
- » Technical Skills
- » Non-Technical Skills
- » Post CTF Analysis



01

THE TITLE OF THE SECTION

(Optional) Additional supporting copy if you need it.



01

THE TITLE OF THIS SECTION

(Optional) Additional supporting if you need it.


**THIS IS A CALL OUT BOX WHERE YOU
CAN ADD A BIG CHUNK OF TEXT ABOUT
SOMETHING YOU WANT TO CALL OUT.
IF YOU WANT TO ACCENT SOME TEXT WITH
PURPLE - COPY & PASTE THIS LINE.**

**THIS IS ANOTHER CALL-OUT
PAGE WHERE YOU HAVE
SUPPORTING VISUALS. YOU
CAN ALSO ACCENT TEXT BY
COPY & PASTING THIS LINE.**

DESIGN NOTE:


When using photography as a design accent – recommend using black & white photos – and overlaying with a purple box at 60% transparency





This is a quote design. Resize the bottom of the text box edge as needed. **Add accent by copying this format.**

- The person that said the quote



This is a quote design. Resize the bottom of the text box edge as needed. Add accent by copying this format.

- The speaker of the quote

QUESTION

THIS IS A QUESTION YOU
MIGHT BE ASKING
YOUR AUDIENCE?

(OPTIONAL) TEXT FOR CONTEXT

WITHOUT MASTER TEMPLATE

If you want to be able to move all the elements in a standard template, you can copy and paste this slide. Removes the master templated components.

(OPTIONAL) TEXT THAT PROVIDES CONTEXT GOES HERE

TITLE OF SLIDE GOES HERE

(Optional) if you want to add some introductory text that helps introduce whatever content you have on the slide, this is the place to do it. Try to keep it to two lines. If it's more, use a different slide layout.

(OPTIONAL) TEXT FOR CONTEXT

SLIDE FOCUSED ON IMAGES

(Optional) Generally this slide is used to showcase images. You might have some intro text.

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(OPTIONAL) TEXT FOR CONTEXT

TITLE OF SLIDE

- This is the first bullet of the slide
 - This is a secondary bullet
 - This is a tertiary bullet
- This is the beginning of another list

(OPTIONAL) TEXT FOR CONTEXT

TITLE OF SLIDE

» This is the first bullet of the slide where you want more emphasis

- This is a secondary bullet
 - This is a tertiary bullet

» This is the beginning of another list

(OPTIONAL) TEXT FOR CONTEXT

TITLE OF SLIDE

☑ This is the first bullet of the slide where you want different emphasis

- This is a secondary bullet
 - This is a tertiary bullet

☑ This is the beginning of another list

(OPTIONAL) ADDITIONAL TEXT FOR SLIDE CONTEXT

THIS IS THE TITLE OF THE SLIDE

Sometimes you want some intro copy to describe what the bullets that you're going to display are representing. This is where that text would go. Ideally it's on two lines, three lines max.

- This is where a normal bullet goes
- And a second normal bullet
- And a third one.

(OPTIONAL) TEXT FOR CONTEXT

SINGLE COLUMN LAYOUT

- This is what the first bullet in the list looks like.
- If you have a lot of text in a bullet it will wrap to two lines and this is what it would look like.
- Bullet #3 has a sub-bullet
 - This is the aforementioned sub-bullet of bullet 3

(OPTIONAL) TEXT FOR CONTEXT

TWO COLUMN LAYOUT WITH INTRO

(Optional) intro text for this two column layout – make sure that whatever you write stays on two lines, otherwise you need to move the boxes up.

- This is the first bullet
 - This is the second bullet
 - This is an indented bullet
- This is the first bullet
 - This is the second bullet
 - This is an indented bullet

(OPTIONAL) TEXT FOR CONTEXT

TWO COLUMN LAYOUT WITH INTRO

(Optional) intro text for this two column layout – make sure that whatever you write stays on two lines, otherwise you need to move the boxes up.

- This is the first bullet
 - This is the second bullet
 - This is an indented bullet
- This is the first bullet
 - This is the second bullet
 - This is an indented bullet

(OPTIONAL) TEXT FOR CONTEXT

TWO COLUMN CONTENT NO INTRO

- This is the first bullet
 - This is the second bullet
 - This is an indented bullet
 - You could also skip the bullets and just put in normal text.
- This is the first bullet
 - This is the second bullet
 - This is an indented bullet
 - You could also skip the bullets and just put in normal text.

(OPTIONAL) TEXT FOR CONTEXT

TWO COLUMN CONTENT NO INTRO

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(OPTIONAL) TEXT FOR CONTEXT

TWO COLUMN LAYOUT WITH PURPLE LIST HEADERS

THIS IS THE FIRST BULLET

- This is the second bullet (indent one in)
 - This is the third bullet

THIS IS THE FIRST BULLET AGAIN

- This is the second bullet
 - This is the third bullet

THIS IS THE FIRST BULLET

- This is the second bullet (indent one in)
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THIS IS THE FIRST BULLET AGAIN

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- This is the second bullet (indent one in)
 - This is the third bullet

THIS IS THE FIRST BULLET AGAIN

- This is the second bullet
 - This is the third bullet

(OPTIONAL) TEXT FOR CONTEXT

ONE-COLUMN WITH BLACK LIST HEADERS

SOMETIMES YOU HAVE SECTIONS FOR LISTS

- And this is the second bullet in the list. So if you click enter and indent. It looks like this

THIS IS ACTUALLY JUST THE FIRST “BULLET” IN THE LIST. THAT’S STYLED WITH PURPLE TEXT

- And this is the second bullet in the list. So if you click enter and indent. It looks like this.

(OPTIONAL) TEXT FOR CONTEXT

ONE COLUMN WITH VISUAL

SOMETIMES YOU HAVE SECTIONS FOR LISTS

- And this is the second bullet in the list. So if you click enter and indent. It looks like this

THIS IS ACTUALLY JUST THE FIRST “BULLET” IN THE LIST. THAT’S STYLED WITH PURPLE TEXT

- And this is the second bullet in the list. So if you click enter and indent. It looks like this.

(OPTIONAL) TEXT FOR CONTEXT

LISTS WITH EMPHASIZED POINTS

(Optional) Some introductory text that provides context for the bullets that you're about to read below.

» THIS IS SOME POINT THAT WE'RE EMPHASIZING

If you indent an emphasized bullet this is the style you get. This copy is added to provide additional information around the emphasized bullet point.

You can also change out the shape of the bullet from check to something else by selecting the bullet dropdown → bullet & numbering → and selecting a standard bullet or an image.

» TAKEAWAY #2 GOES HERE

And the text associated with takeaway #2

» TAKEAWAY THAT YOU WANT THE READER TO SEE

Short block of text that you just have to indent to get. AMAZING!

(OPTIONAL) TEXT FOR CONTEXT

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(OPTIONAL) TEXT FOR CONTEXT

LISTS WITH EMPHASIZED POINTS (CENTER HEADER)

(Optional) Some introductory text that provides context for the bullets that you're about to read below.

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TITLE FOR A SERIES THAT HAS EMPHASIS

(Optional) Text that provides a little high-level context if you deem it necessary

Depending on the number of bullets you have, it may make sense to repositioning the title and this supporting copy.

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» THIS BULLET STYLE IS DIFFERENT THAN THE PREVIOUS PAGE.

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(OPTIONAL) TEXT FOR CONTEXT

CALL OUT METRICS WITH SOME ICONS OR IMAGES

(Optional) Some introductory text that provides context for the profiles you're about to look at below

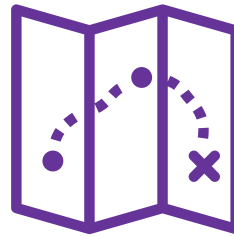
If you choose not to use this text, move the profiles and descriptions up.



525,600

MINUTES

How do you measure, measure
a year? How about love?



1,000

MILES

To be the man who walks that
far to fall down at your door.



999

BOTTLES OF BEER

On the wall. But if you take one
down and pass it around.
There's fewer.

(OPTIONAL) TEXT FOR CONTEXT

IF YOU NEED TO SHOW PROFILE PICTURES

(Optional) Some introductory text that provides context for the profiles you're about to look at below

If you choose not to use this text, move the profiles and descriptions up.



DAENERYS
TARGARYEN
Mother of Dragons



JON
SNOW
The True King



CERSEI
LANNISTER
Queen of 7 Kingdoms



ARYA
STARK
Arya Horseface



TYRION
LANNISTER
Hand of the Queen

(OPTIONAL) TEXT FOR CONTEXT

LOGO OR PHOTO LISTS

(Optional) Some introductory text that provides context for the profiles you're about to look at below

If you choose not to use this text, move the profiles and descriptions up.



(OPTIONAL) TEXT FOR CONTEXT GOES HERE

SLIDE TO SHOW TEAM NAMES WITH LOGOS

(Optional) If you want to include some introductory text about the information you're providing.

Keep to 2 lines.



PETER PARKER

Spiderman

TONY STARK

Iron Man

JAMES HOWLETT

Wolverine

STEVE ROGERS

Captain America



CLARK KENT

Superman

BRUCE WAYNE

Batman

BARRY ALLEN

Flash

DIANA PRINCE

Wonder Woman

(OPTIONAL) TEXT FOR CONTEXT

LIST WITH DETAILS AND OPTIONAL IMAGES

EXPECTO PATRONUM

Gets rid of pesky Dementors by summoning a badass Patronus to chase them away

ACCIO

The perfect charm for lazy people who can't be bothered to get up and fetch the TV remote.

WINGARDIUM LEVIOSA.

Makes things levitate. Sounds fun.

EXPELLIARMUS

Basically the only spell Harry ever uses when he's in a duel.

LUMOS

The spell equivalent of that little torch app on your iPhone.

ALOHOMORA

That one Hermione keeps using to unlock doors when they go sneaking around in the first book. But only works on select doors. People forget to use it.

(OPTIONAL) TEXT THAT PROVIDES CONTEXT GOES HERE

TITLE OF SLIDE GOES HERE

(Optional) if you want to add some introductory text that helps introduce whatever content you have on the slide, this is the place to do it. Try to keep it to two lines. If it’s more, use a different slide layout.

ACTIVITY	FTES	QUARTERLY FEES
Continuous Application Testing, Cloud Security, and Social Engineering <ul style="list-style-type: none">Focused on previous application testing scope from 2014 testing cycleThis is another bullet associated with this table	2	\$250,000
Continuous Application Testing, Cloud Security, and Social Engineering <ul style="list-style-type: none">Focused on previous application testing scope from 2014 testing cycleThis is another bullet associated with this table	2	\$250,000
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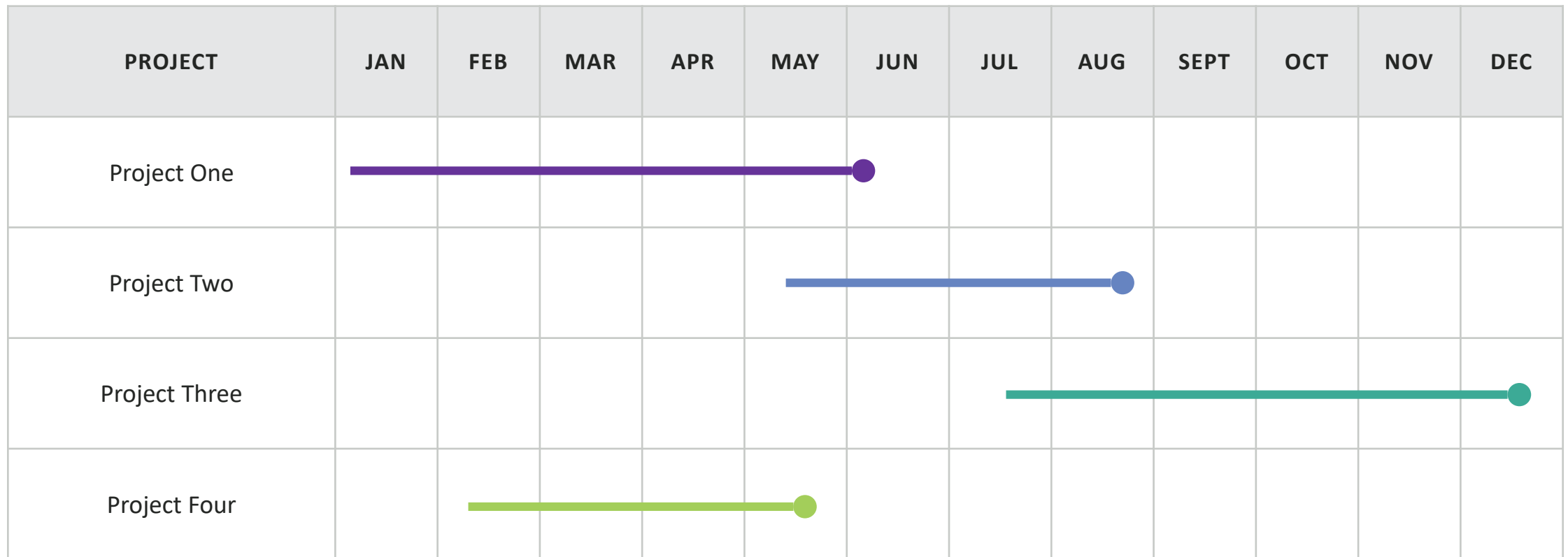
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	BASELINE		TARGETED		IN-DEPTH	
ACTIVITY	DAYS	FEES	DAYS	FEES	DAYS	FEES
Hybrid Application Assessment	26	\$120,034	26	\$120,034	26	\$120,034
Internal Penetration Testing	5	\$120,034	5	\$120,034	5	\$120,034
Red Teaming	23	\$120,034	23	\$120,034	23	\$120,034
Threat Modeling	5	\$120,034	5	\$120,034	5	\$120,034
Project Management & Reporting	4	\$120,034	4	\$120,034	4	\$120,034
TOTAL	62	\$120,034	62	\$120,034	62	\$120,034

(OPTIONAL) TEXT THAT PROVIDES CONTEXT GOES HERE

TITLE OF THE SLIDE GOES HERE

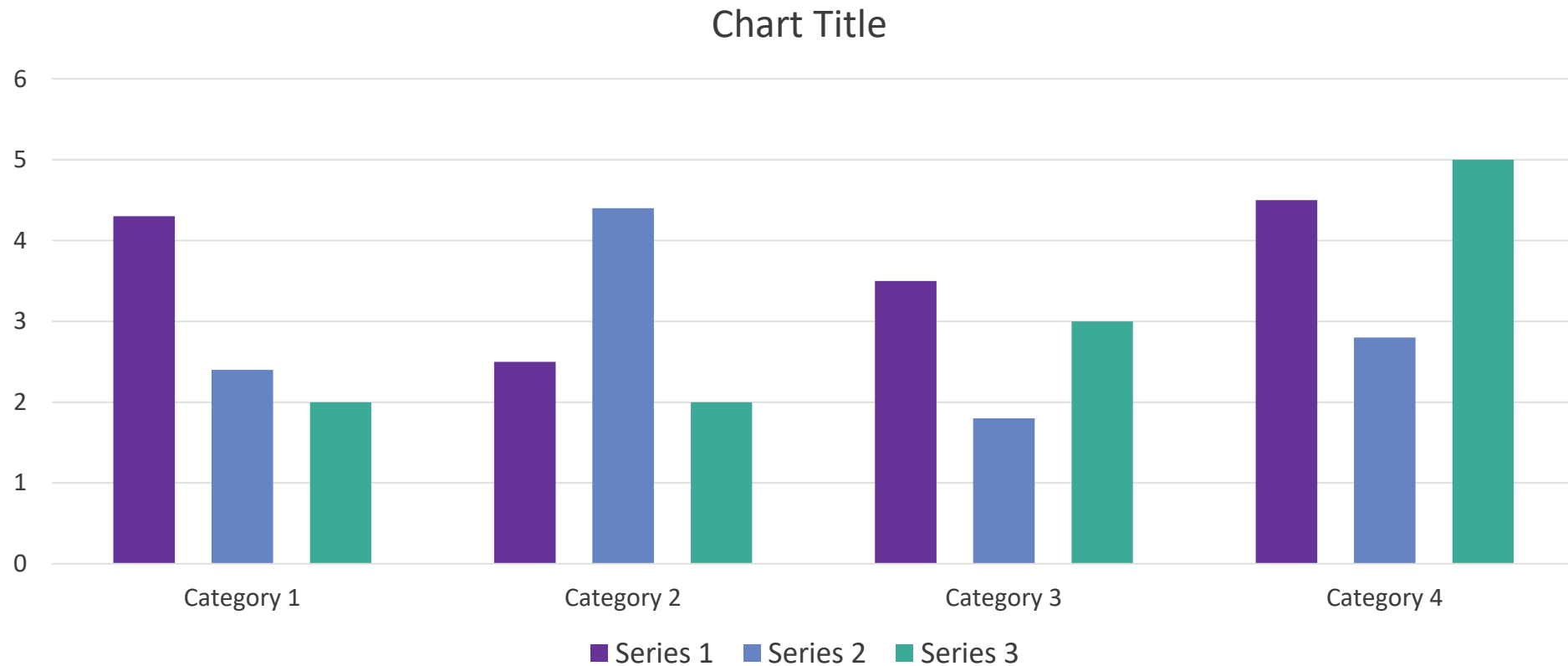
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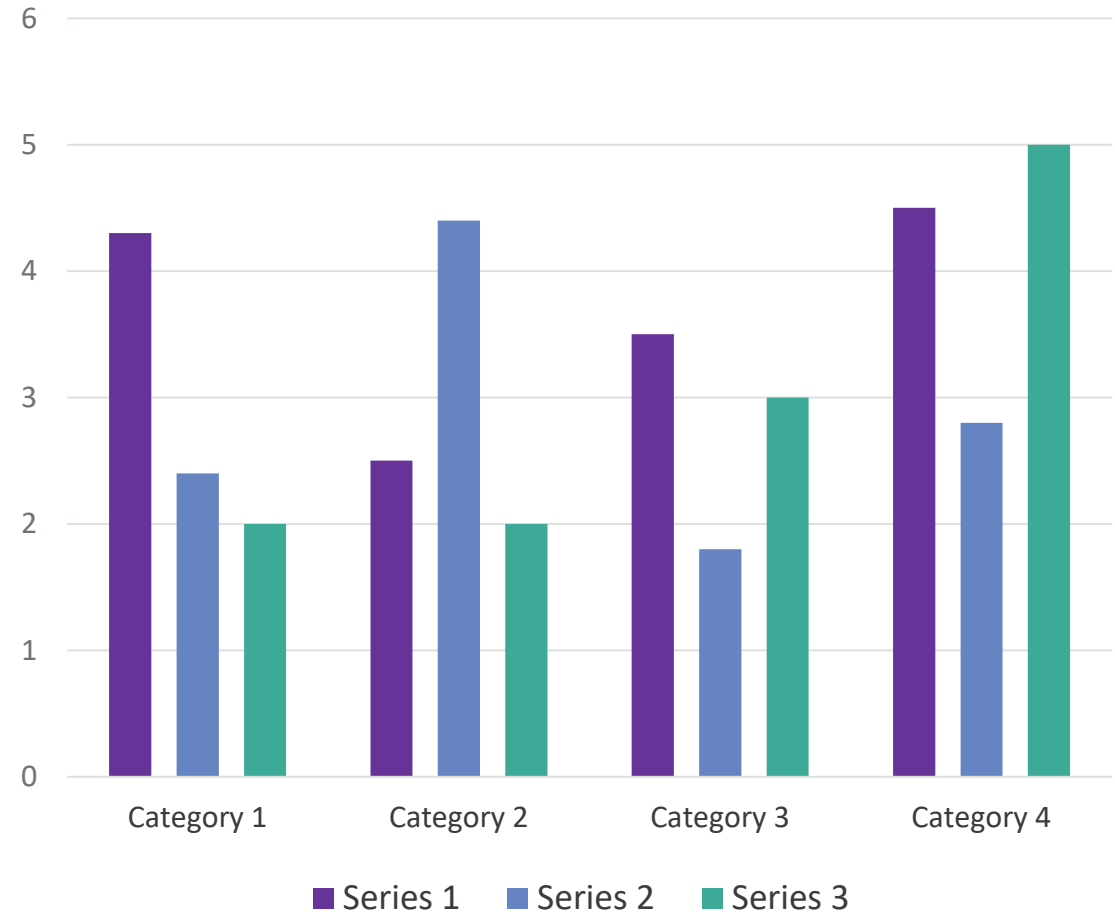
» TAKEAWAY #2 GOES HERE

And the text associated with takeaway #2

» TAKEAWAY THAT YOU WANT THE READER TO SEE

Short block of text that you just have to indent to get. AMAZING!

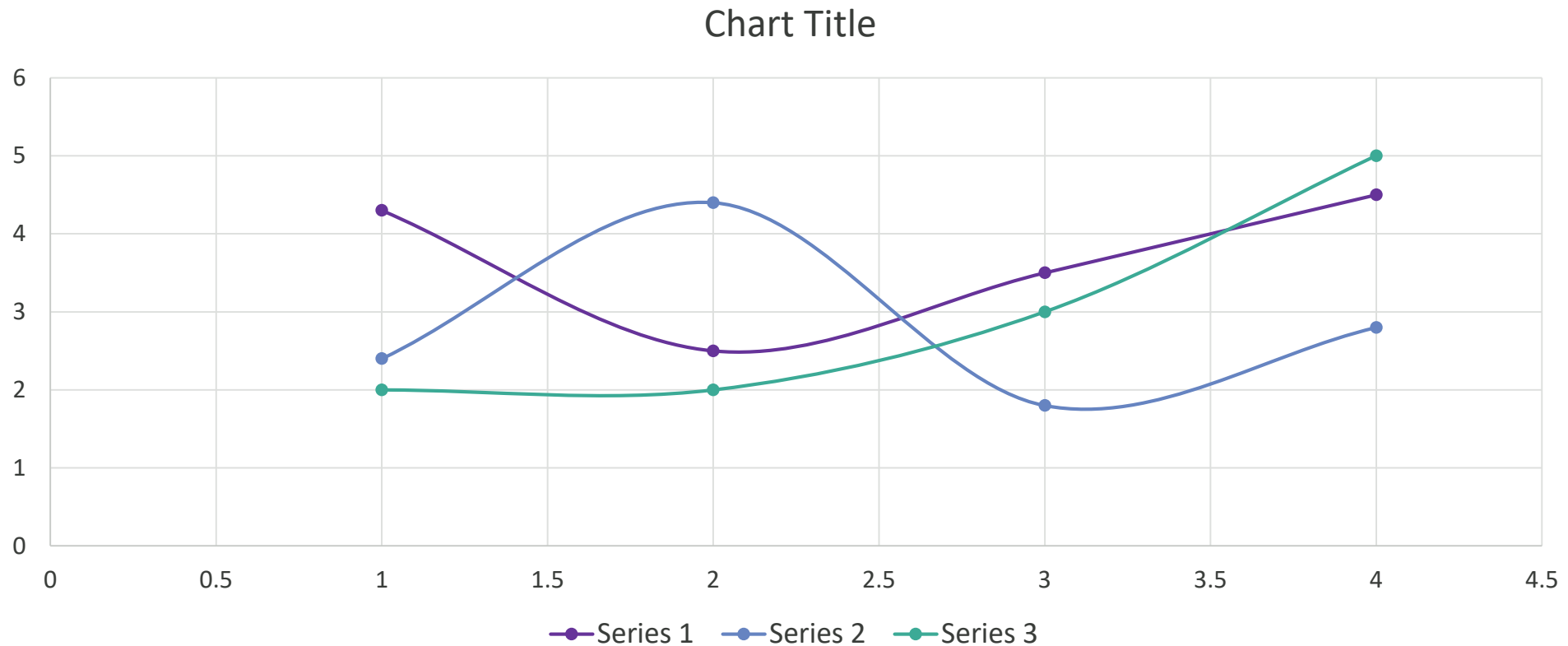
Chart Title



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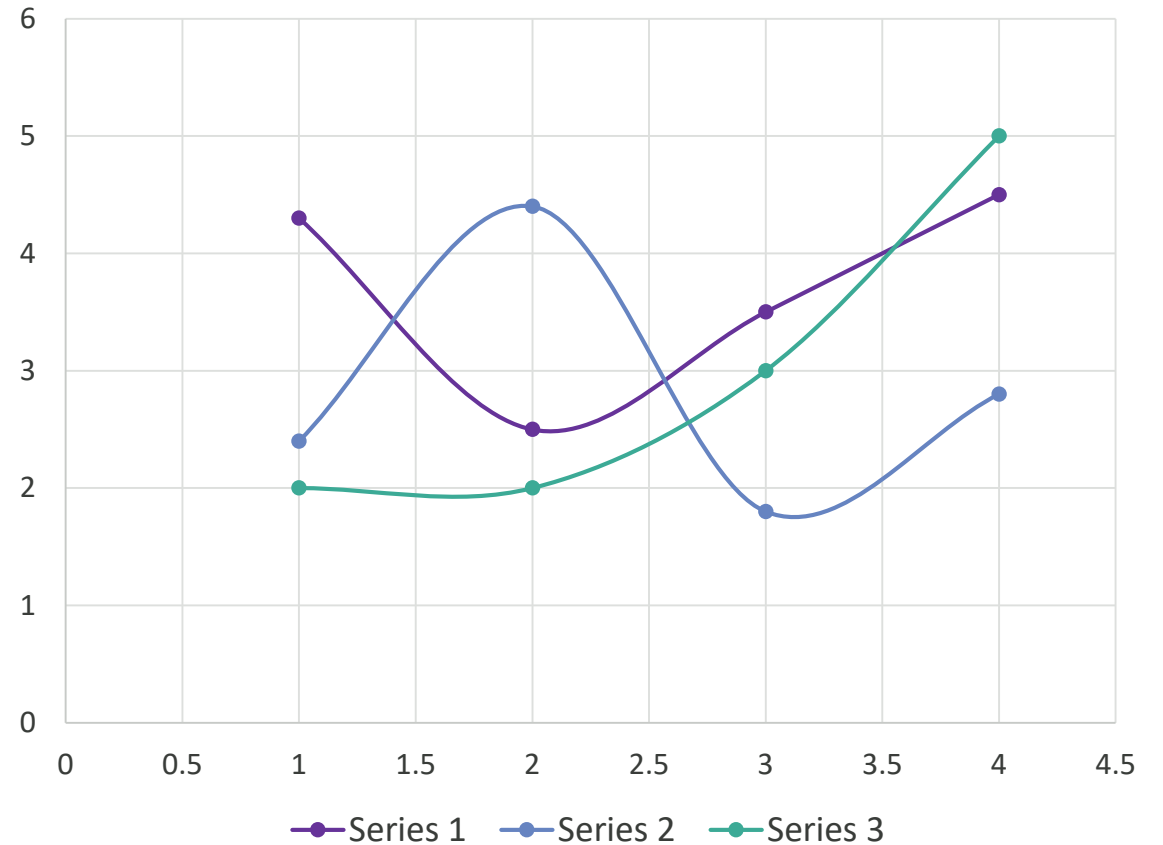
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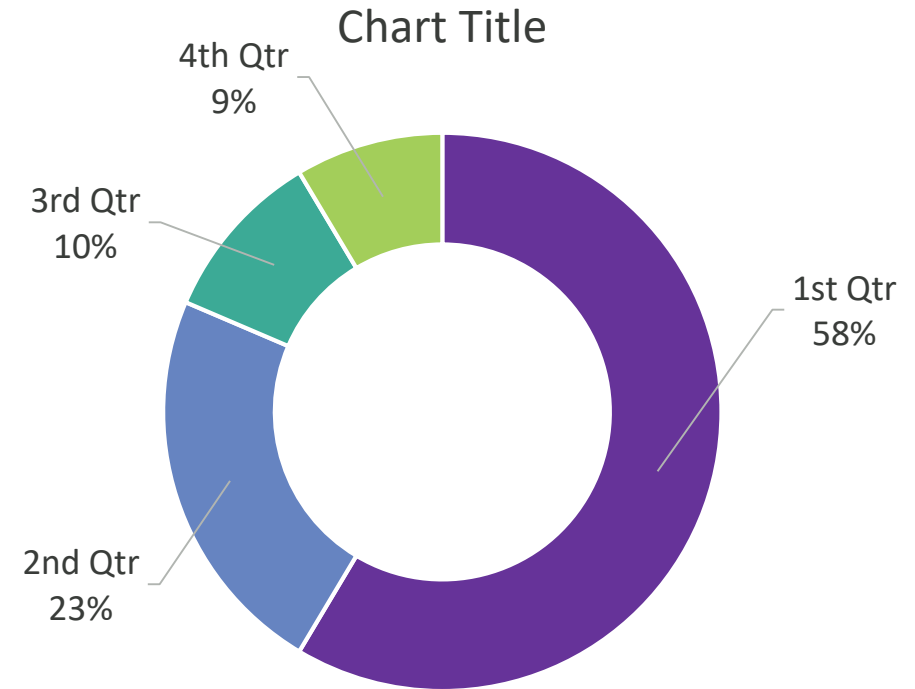
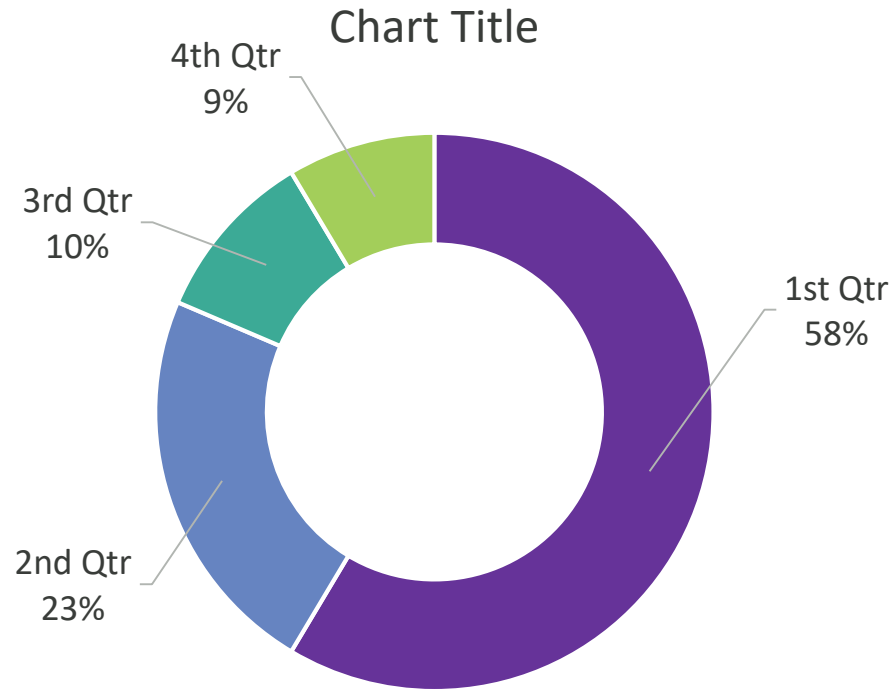
Chart Title



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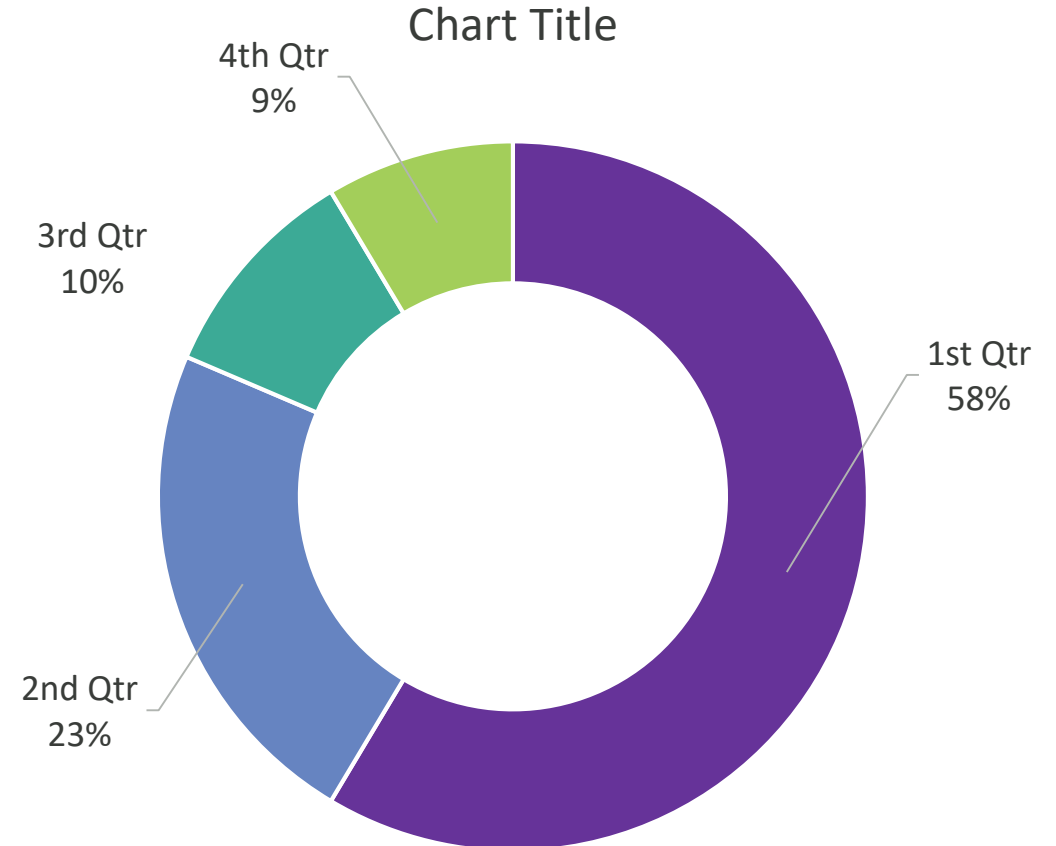
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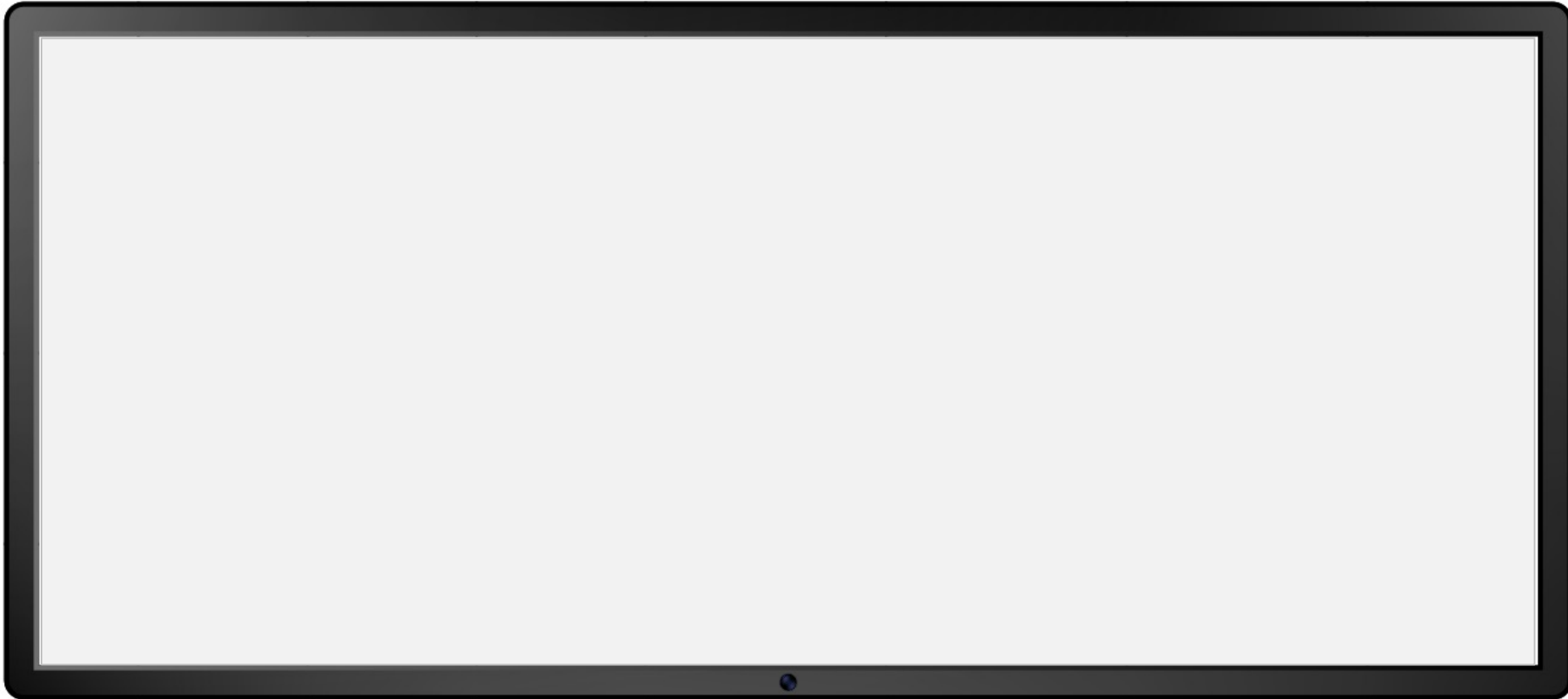
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(OPTIONAL) TEXT THAT PROVIDES CONTEXT GOES HERE

TITLE OF THE SLIDE GOES HERE



- This is some point that we're emphasizing
 - If you indent an emphasized bullet this is the style you get.
- Bullet #2
- Bullet #3

THANK
YOU



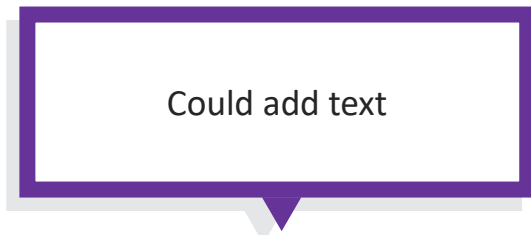
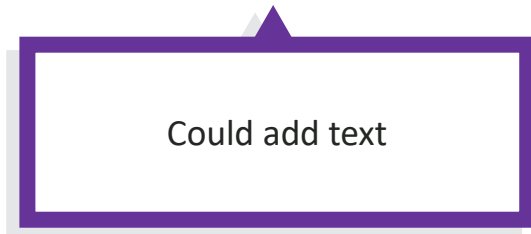
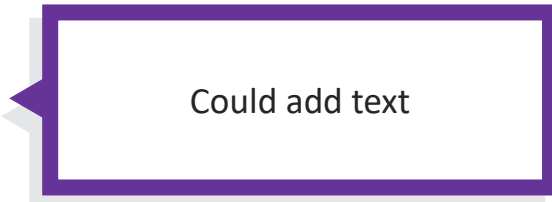
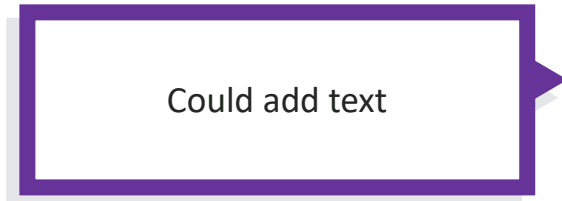
THANK
YOU



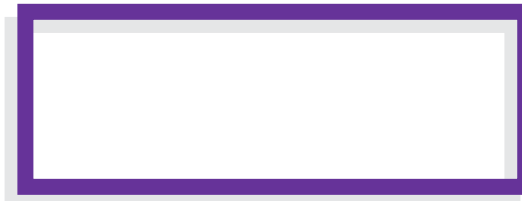
DESIGN ASSETS

CALL-OUTS

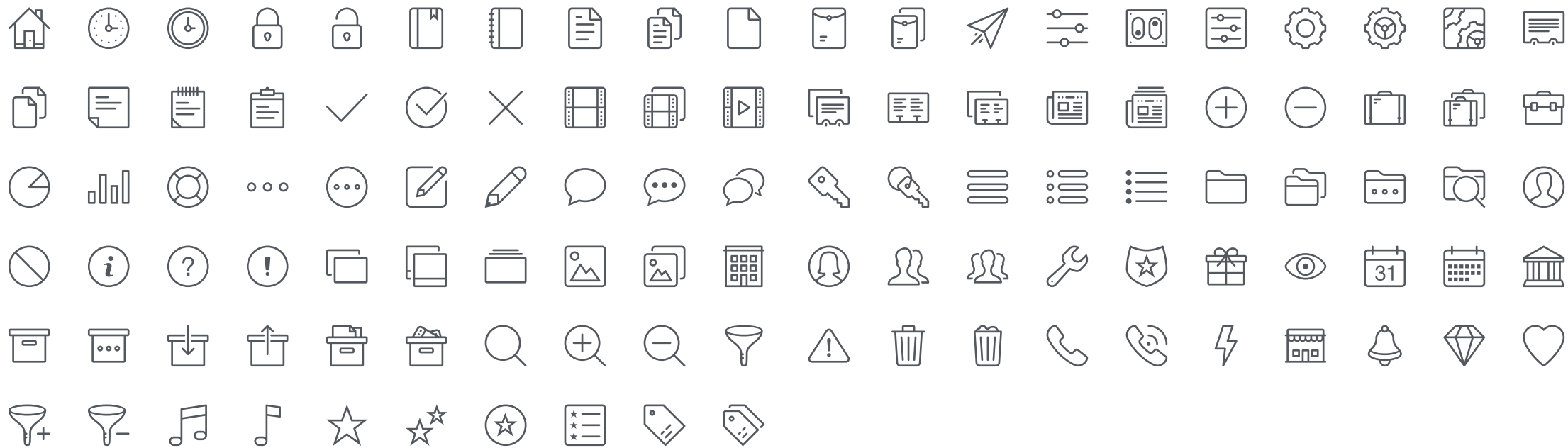
If you want to highlight a specific part of an image or create a call out – use the items shown below.



DESIGN NOTE:
To change size of box, or move arrow position – “ungroup” change components and re-“group”



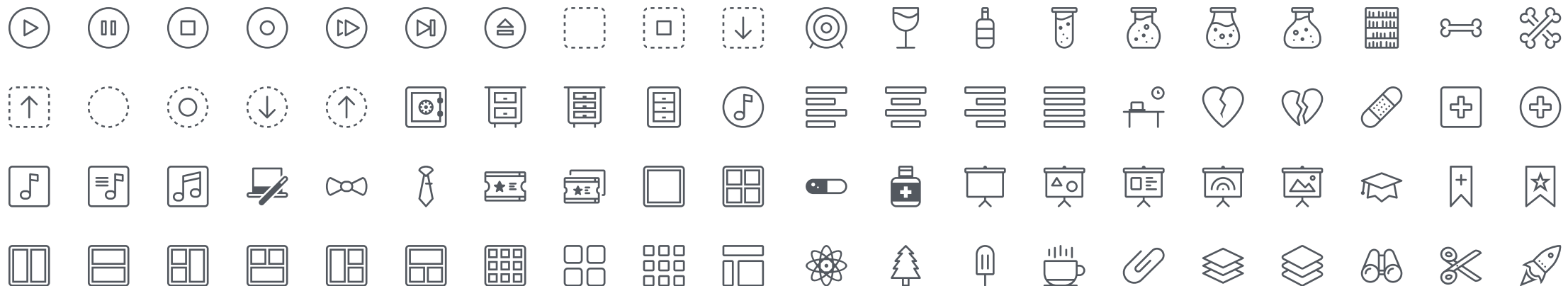
General



Electronics



Miscellaneous



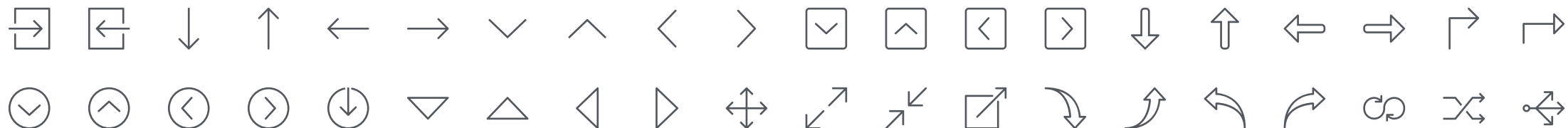
E-Commerce



Web



Arrows



Location



Weather

