

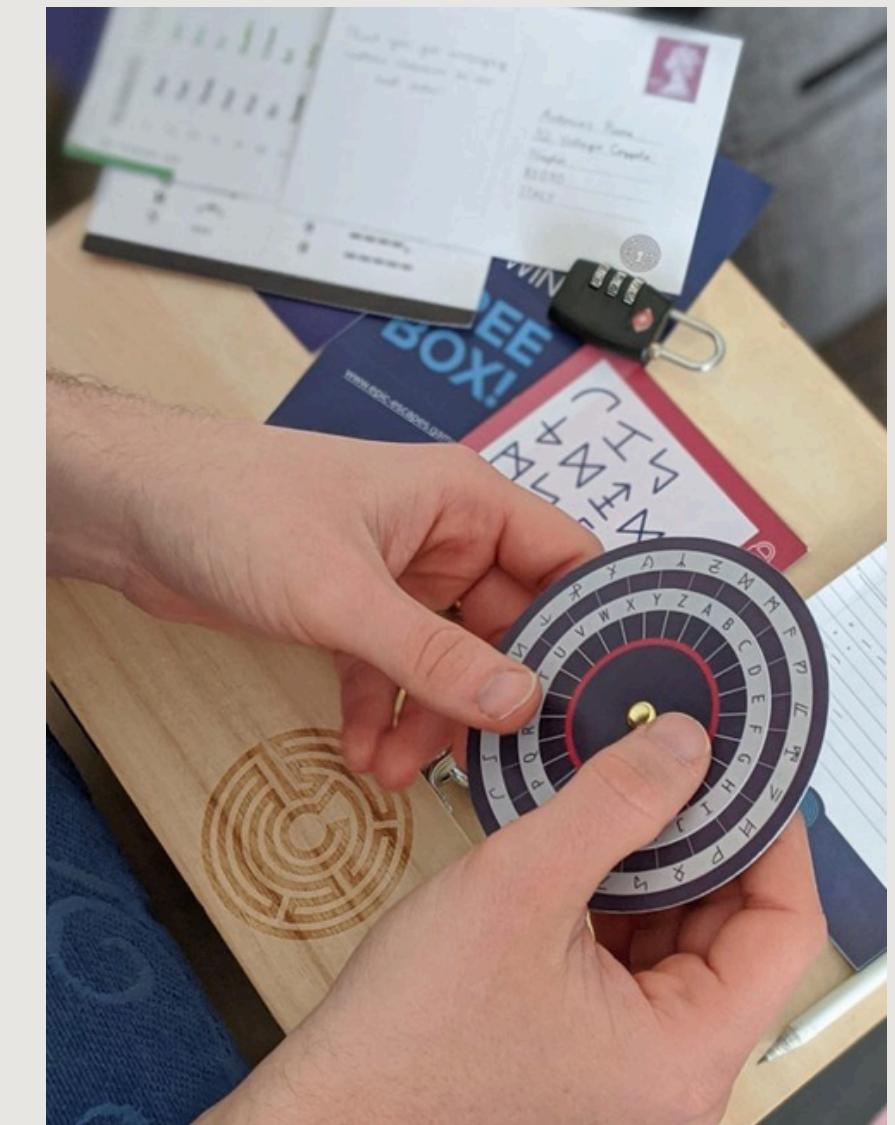
# e-scape

create, customize, challenge

GROUP 21

# *What are at-home escape rooms?*

- Played with friends.
- Series of puzzles guided by a story.
- Put into a fictional and adventurous situation.
- Must solve puzzles to escape!



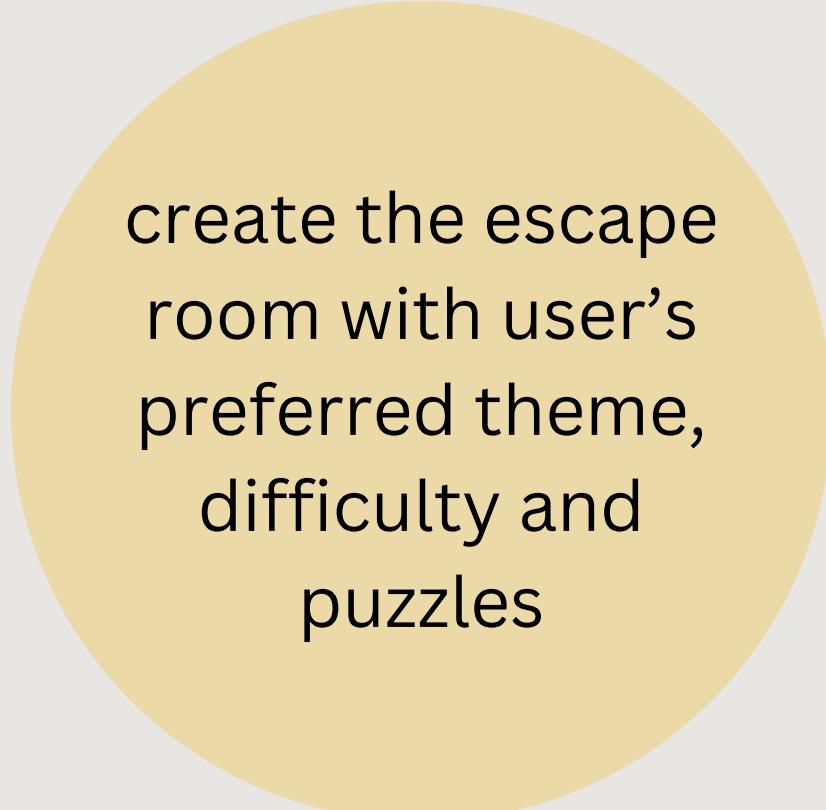
# *The problem*

- Pre-made by hand, not dynamically generated.
- Lack of customisability.
- Limited replayability.



# *Our solution*

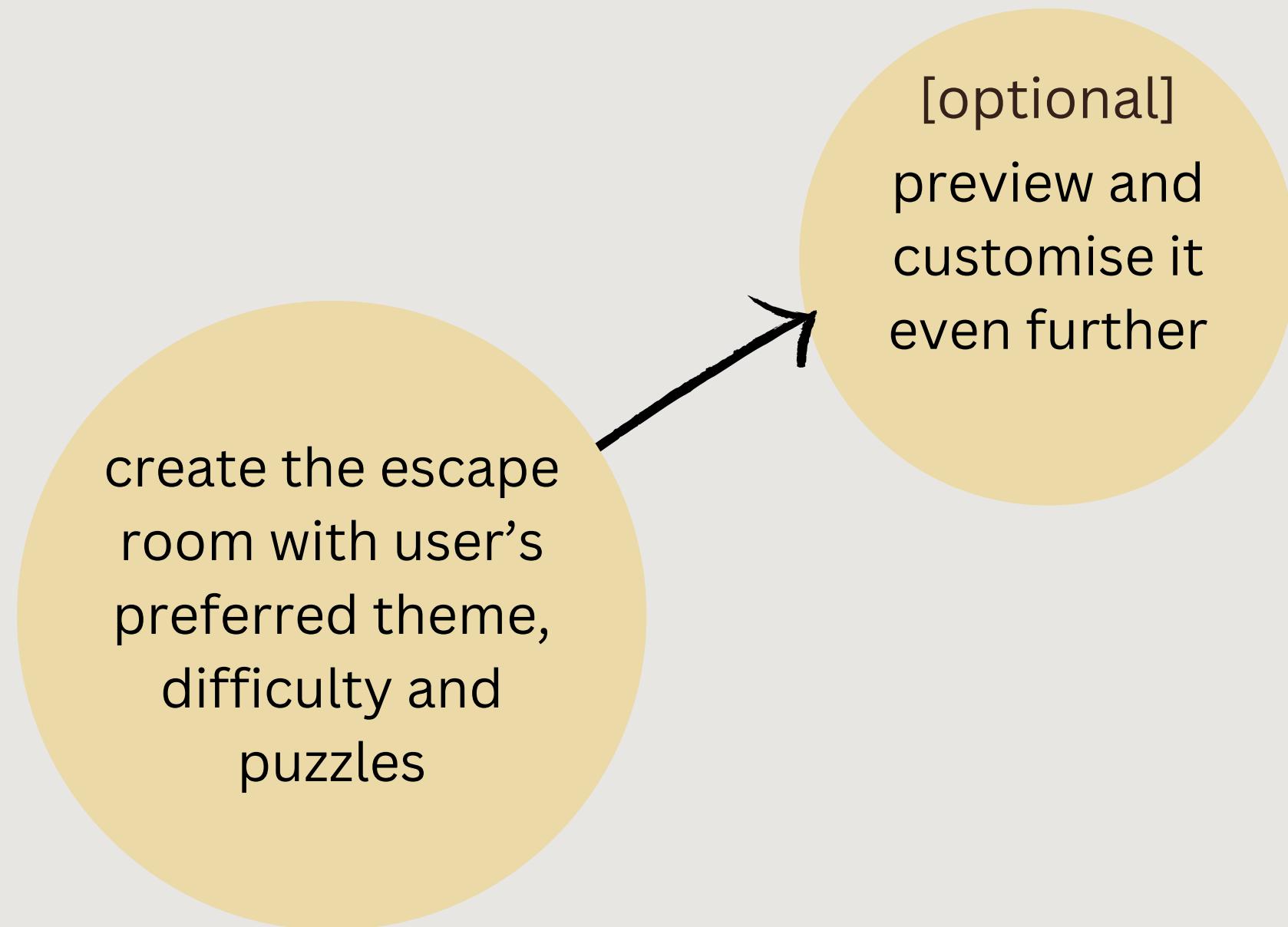
This is why we created e-scape.



create the escape room with user's preferred theme, difficulty and puzzles

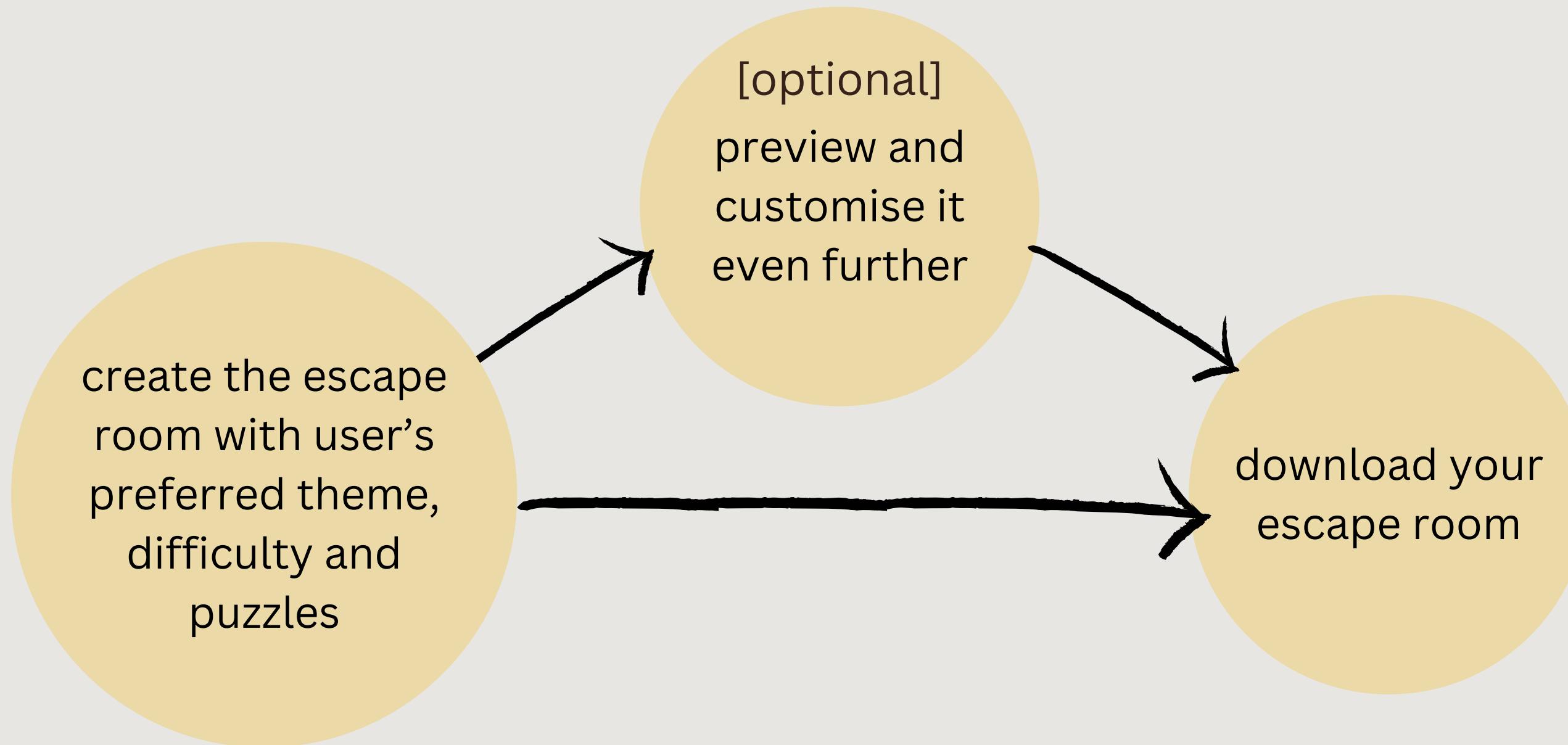
# *Our solution*

This is why we created e-scape.



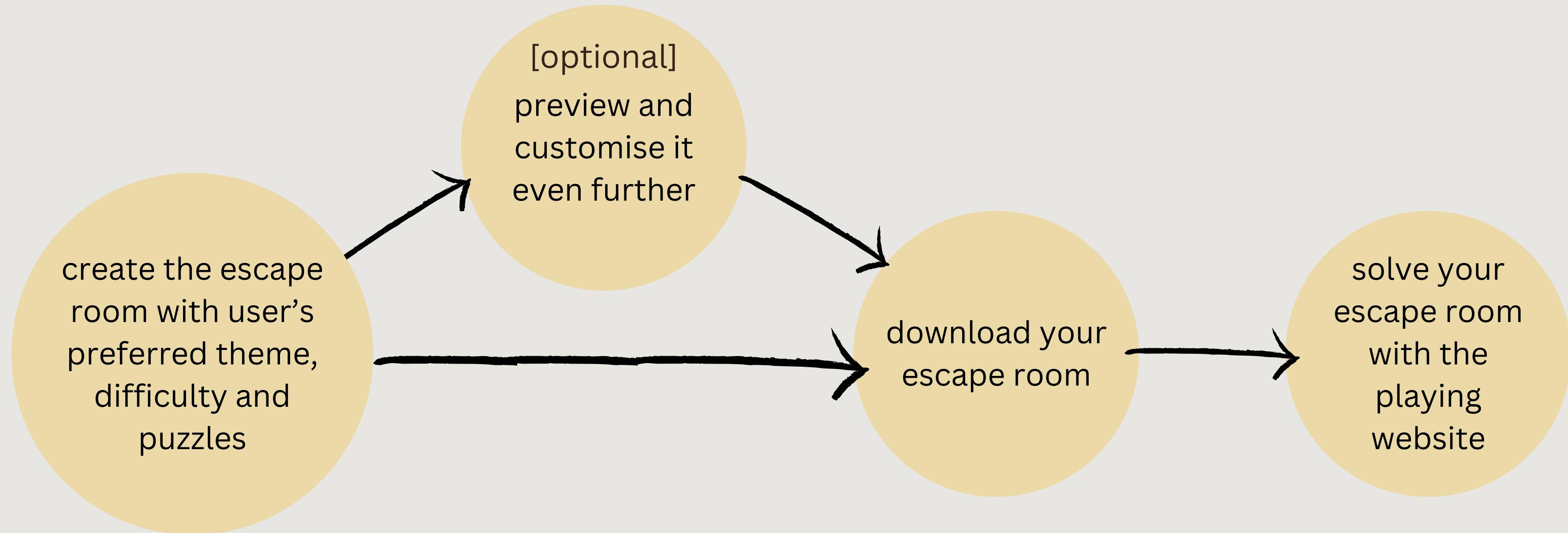
# *Our solution*

This is why we created e-scape.



# *Our solution*

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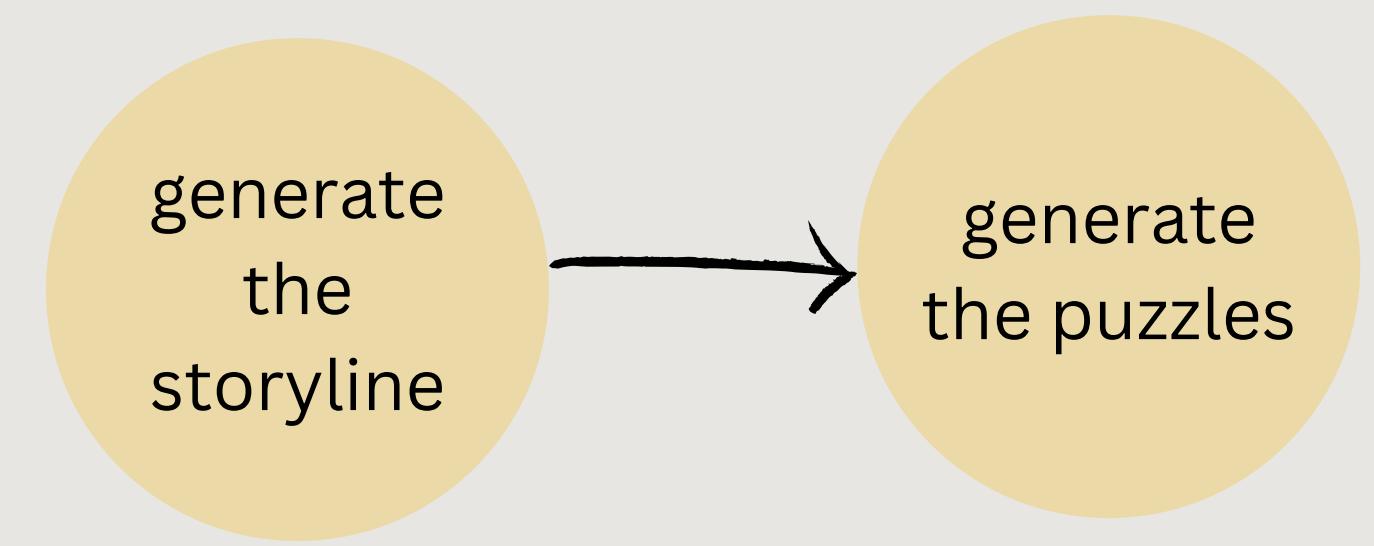
*Generating an escape room*

# *Generating an escape room*

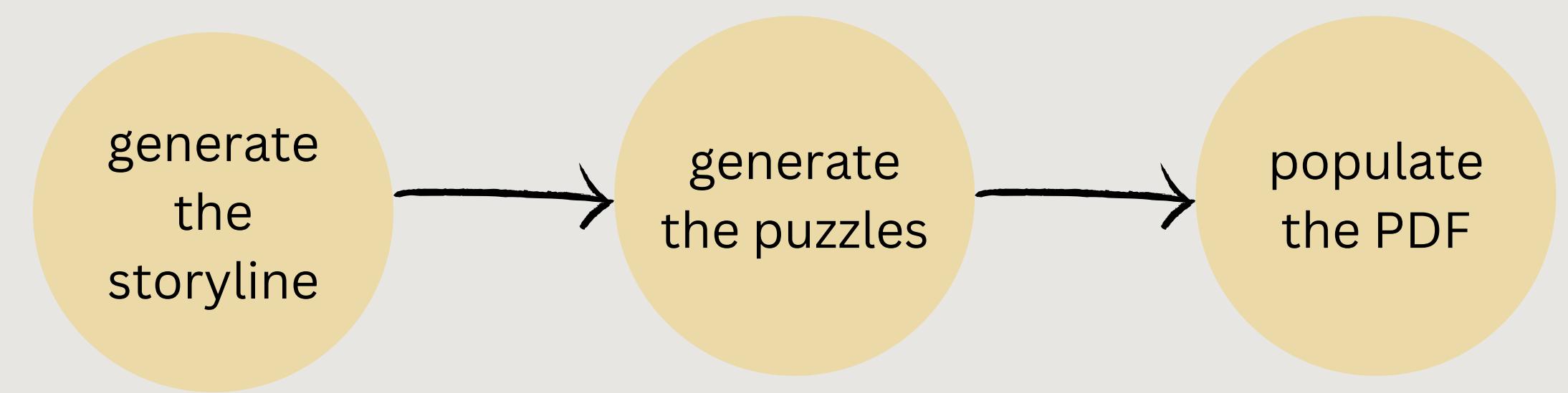


generate  
the  
storyline

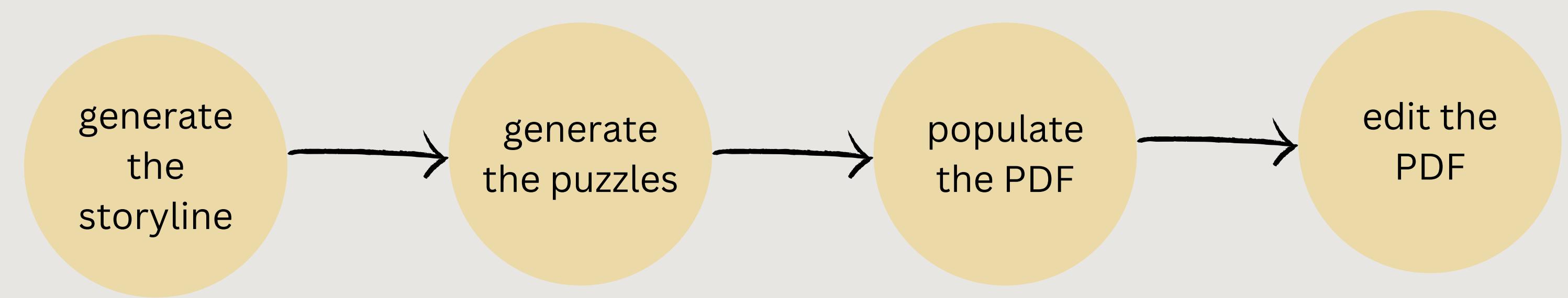
# *Generating an escape room*



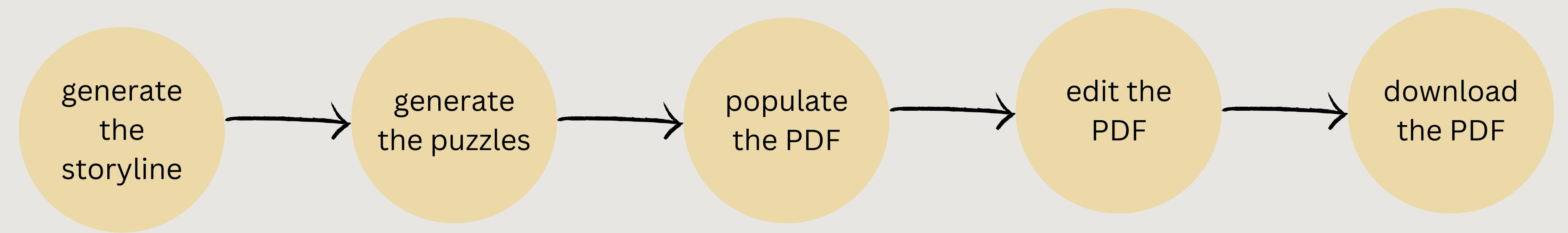
# *Generating an escape room*



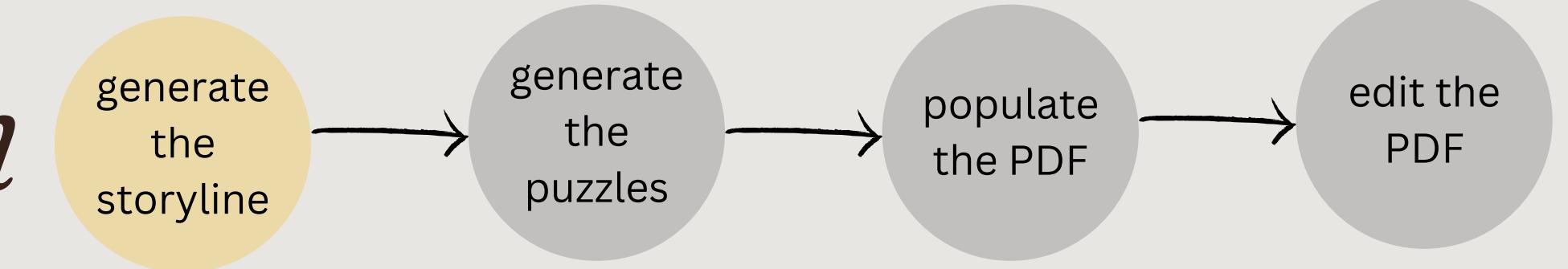
# *Generating an escape room*



# *Generating an escape room*



# *Storyline generation*



## How does it work?

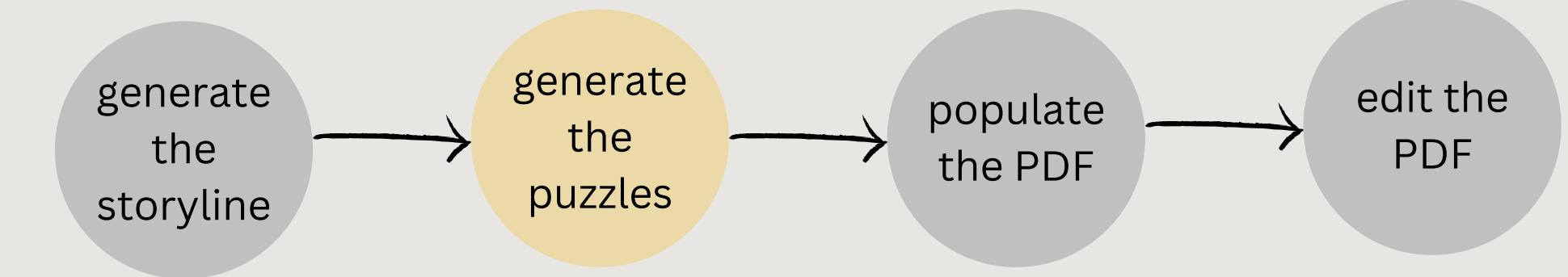
- Microsoft's Guidance Library.
- OpenAI's GPT 4 for storyline generation.

## Challenges:

- Prompt engineering.
- Reducing costs.

<https://github.com/guidance-ai/guidance/tree/main/docs>

# *Puzzle generation*



## How does it work?

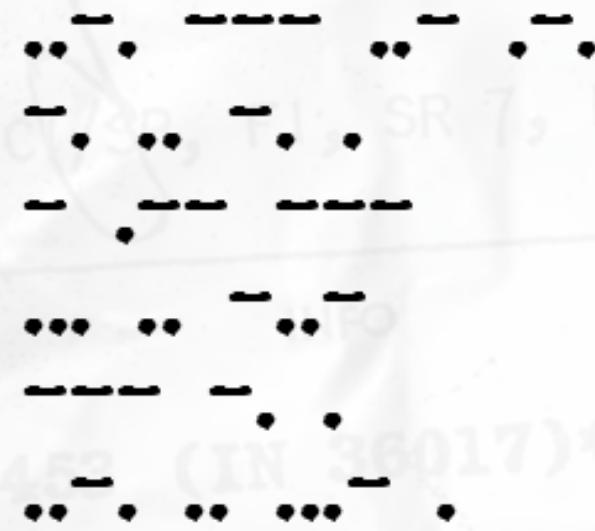
- Start with a 6-digit solution.
- Generators then generate a problem for this solution.

## Challenges:

- Manipulating puzzle generators (e.g. maze) to have a number as its solution.
- Generating the puzzle for any 6-digit solution.
- Cannot use LLMs/current generative AI for puzzle generation

# Puzzle generation

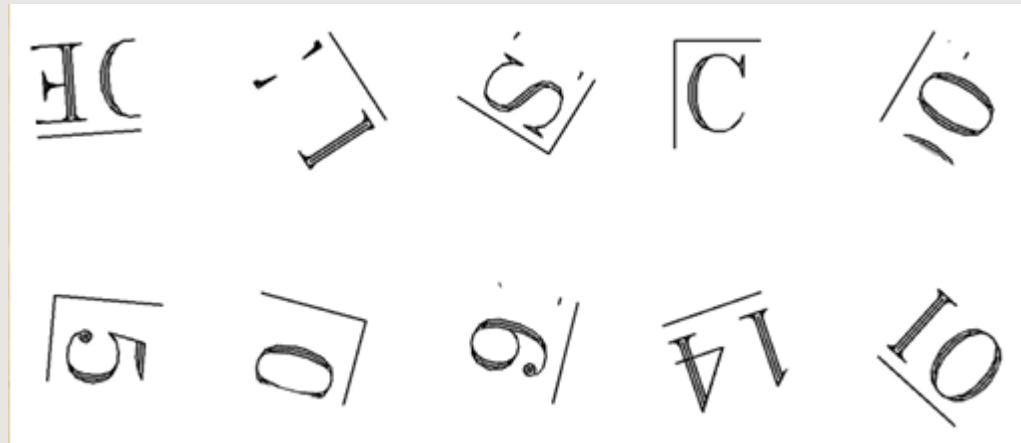
ENVES  
ENO  
FVIE  
ISX  
ENO  
FURO



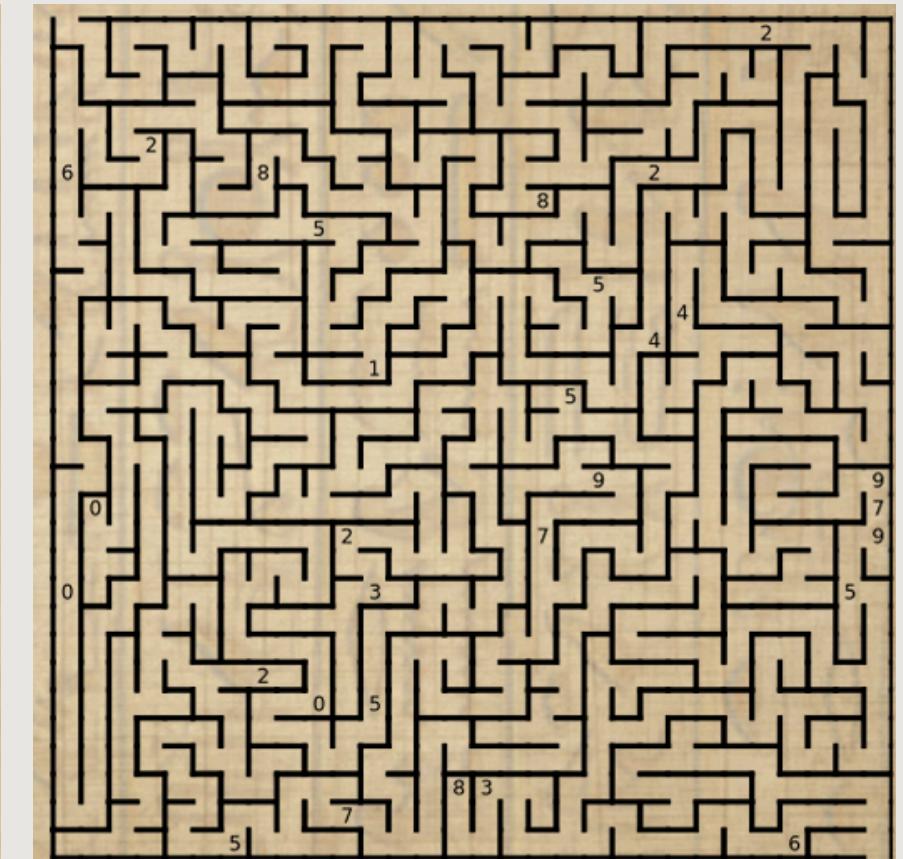
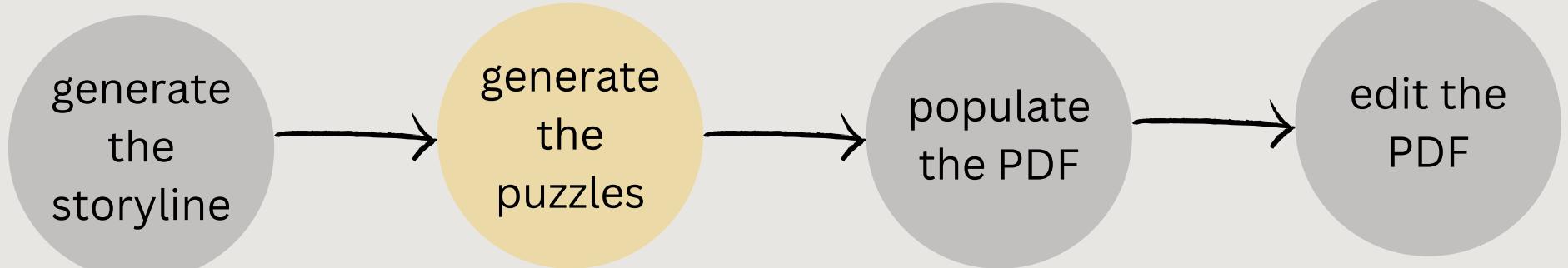
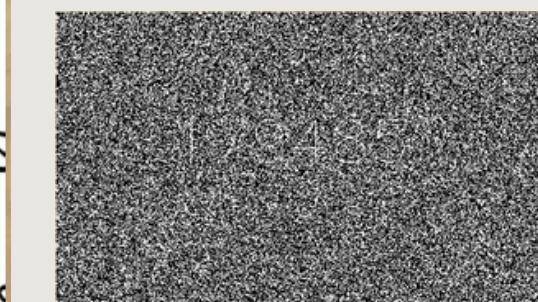
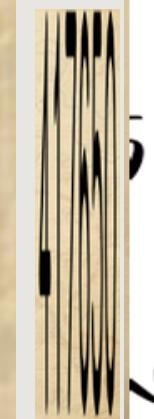
manufacturing to notion under crocus during kohlrabi eyestrain after buckwheat towards parrot choosing during stability inside subexpression nightclub for overweight until surround bather in goodie on delight on swath around plasterboard downfall inside platinum around overview during answer

6 11 28 49

X	I	G	R	E	T	W	X
S	E	H	H	E	O	O	E
I	X	T	T	T	W	O	N

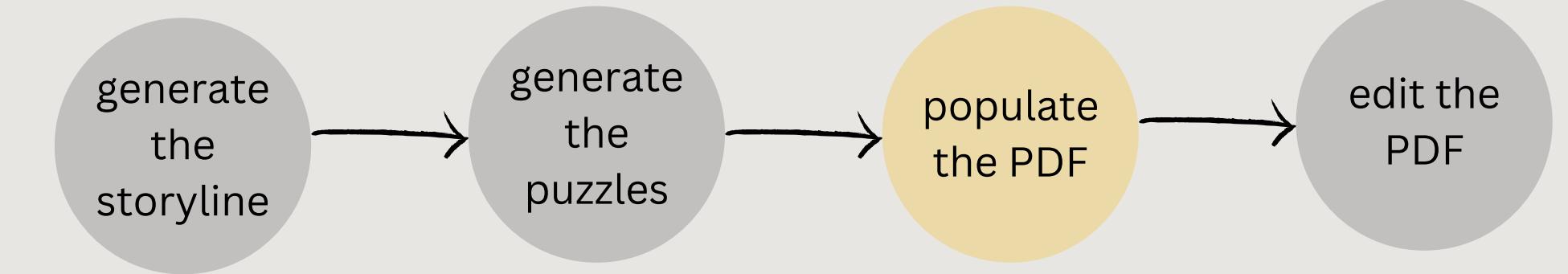


BFDEQ  
CLRO  
RFRB  
QEONB  
LJBOL  
BFDEQ



R	K	I	B	V	S	O	Q	G	T	T	E
S	A	F	L	O	I	E	F	I	V	E	F
F	O	U	R	O	E	U	C	Z	V	Y	X
Z	A	F	O	M	F	W	C	H	T	G	S
V	Q	L	M	H	Z	U	C	C	W	S	F
V	A	Q	I	G	S	E	V	E	N	O	R
T	W	O	Q	N	P	H	K	T	U	U	B
S	H	A	X	B	W	T	B	R	Z	G	Y
Y	M	U	Y	S	E	V	E	N	N	J	I
R	S	G	U	O	B	G	F	T	L	E	H
R	J	G	L	T	D	G	Y	R	U	F	R
Z	O	X	Q	K	F	V	O	N	K	D	M

# *PDF Generation*

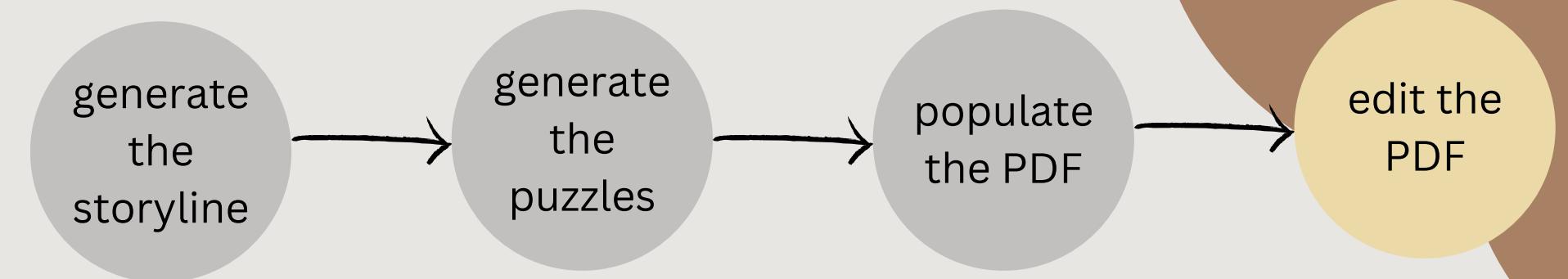


## How does it work?

- Our own forked templating library (using FPDF2).
- Define layouts for different page types.

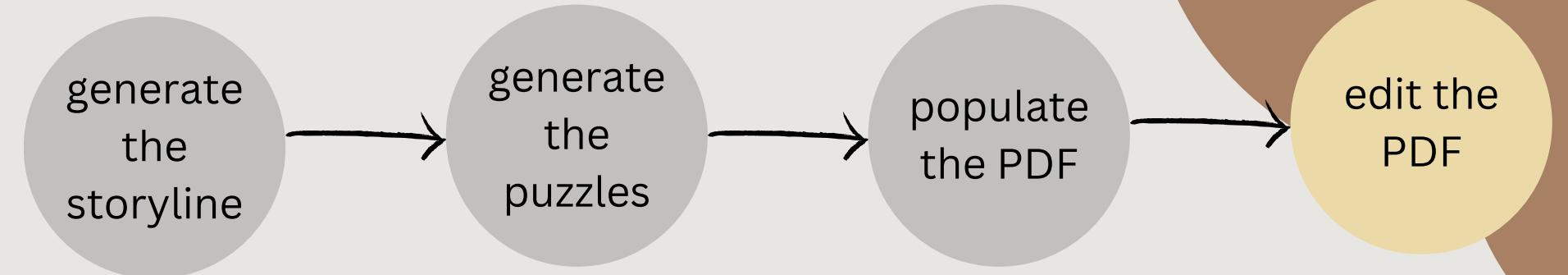
## Challenges:

- Finding a library that worked for us (usually PDF format is made for documents, not freeform designs).
- Reducing time taken.



# *Editing an escape room*

# *Room editing*



How does it work?

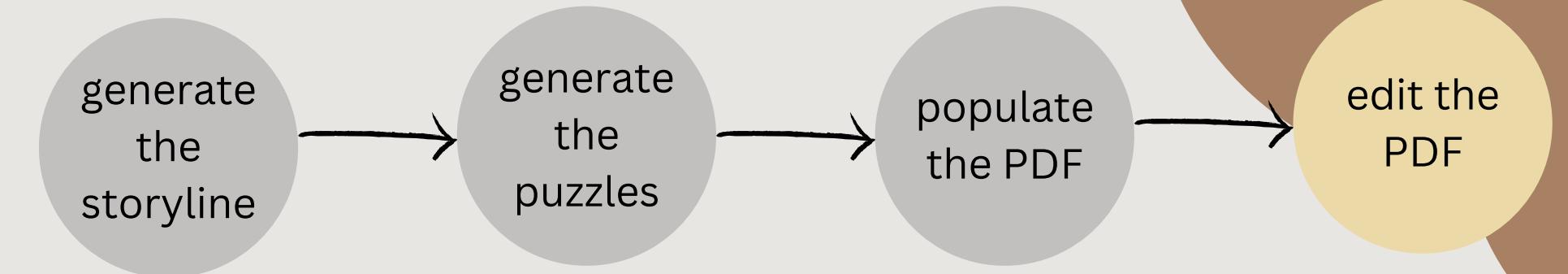
- Preview the escape room.
- Customise different components of the room until satisfied.

Challenges:

- Reducing time taken for PDF generation and retrieval from VM.

# *Database design*

- Storage of room properties
- User accounts.
- NoSQL
- Avoids the complexity and rigidity of SQL tables
- Room and user account as collections





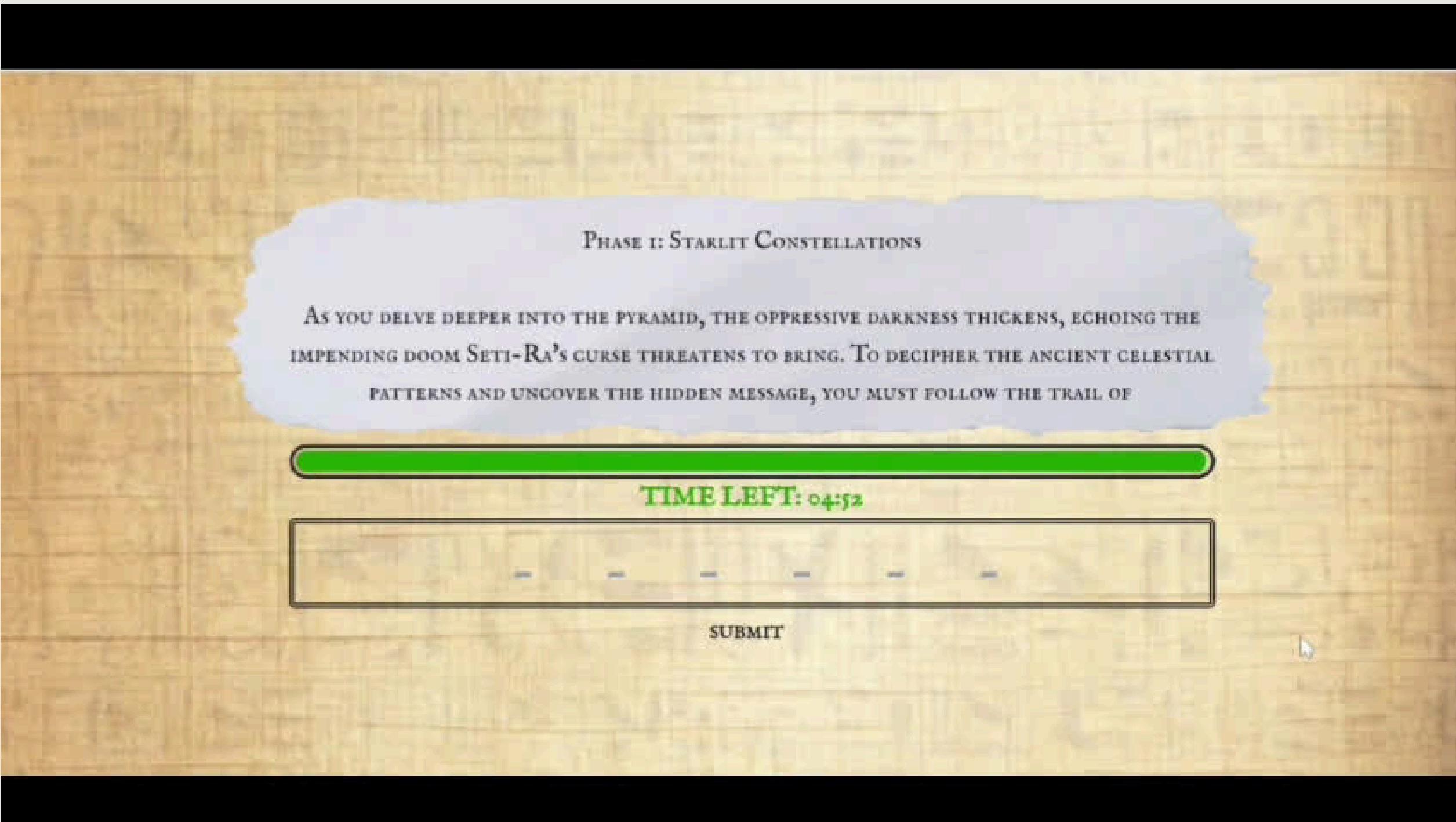
*Playing an escape room*

# *Playing the escape room*

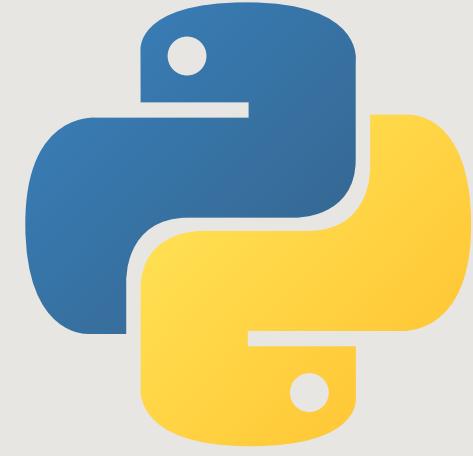
Why?

- An escape room is not complete without a platform to play it on!
- Players can race against the clock to test their problem-solving capabilities in an environment that simulates an escape room.

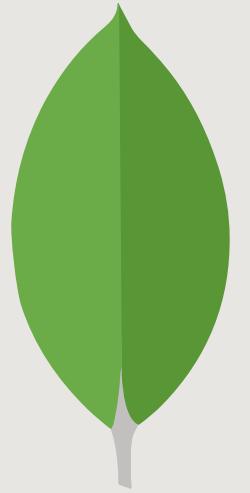
# *What happens if the player runs out of time?*



# *Technical Implementation*



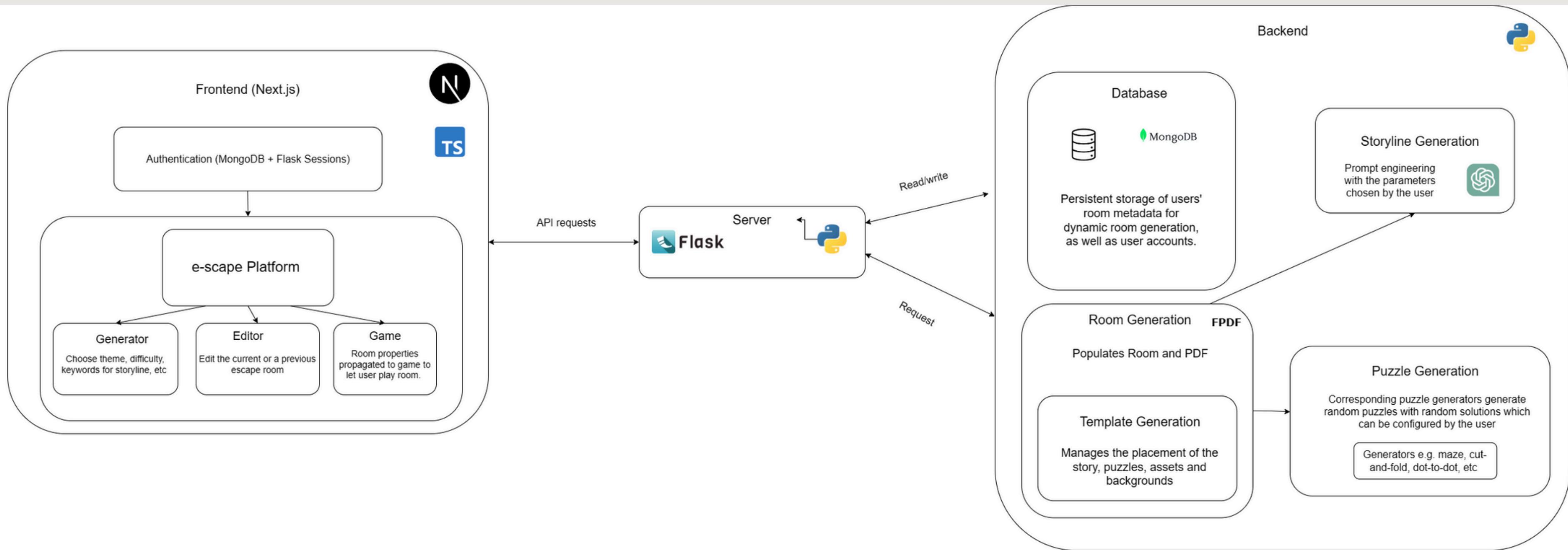
~~NEXT~~.JS



mongoDB



# Architecture



# *Evaluation (Testing)*

- CI/CD pipeline.
- Unit tests, integration and end-to-end tests.
- Iterative play-testing.
- User-testing.

# *Evaluation*

## Successes:

- Achieved the main aim of play-at-home escape room generation.
- Worked on additional customisation and playing website features.
- Puzzle generation.

## Areas of improvement:

- Performance
- Deployment into larger scale (e.g. cloud)
- Reducing file sizes (at minimum, 20MB).

# *Future work*

- During creation, allowing users to enter a theme rather than choosing from a given list.
- Allowing users to add their own puzzle generators to the codebase.
- Monetisation



*Thank you!*

# *Appendix*

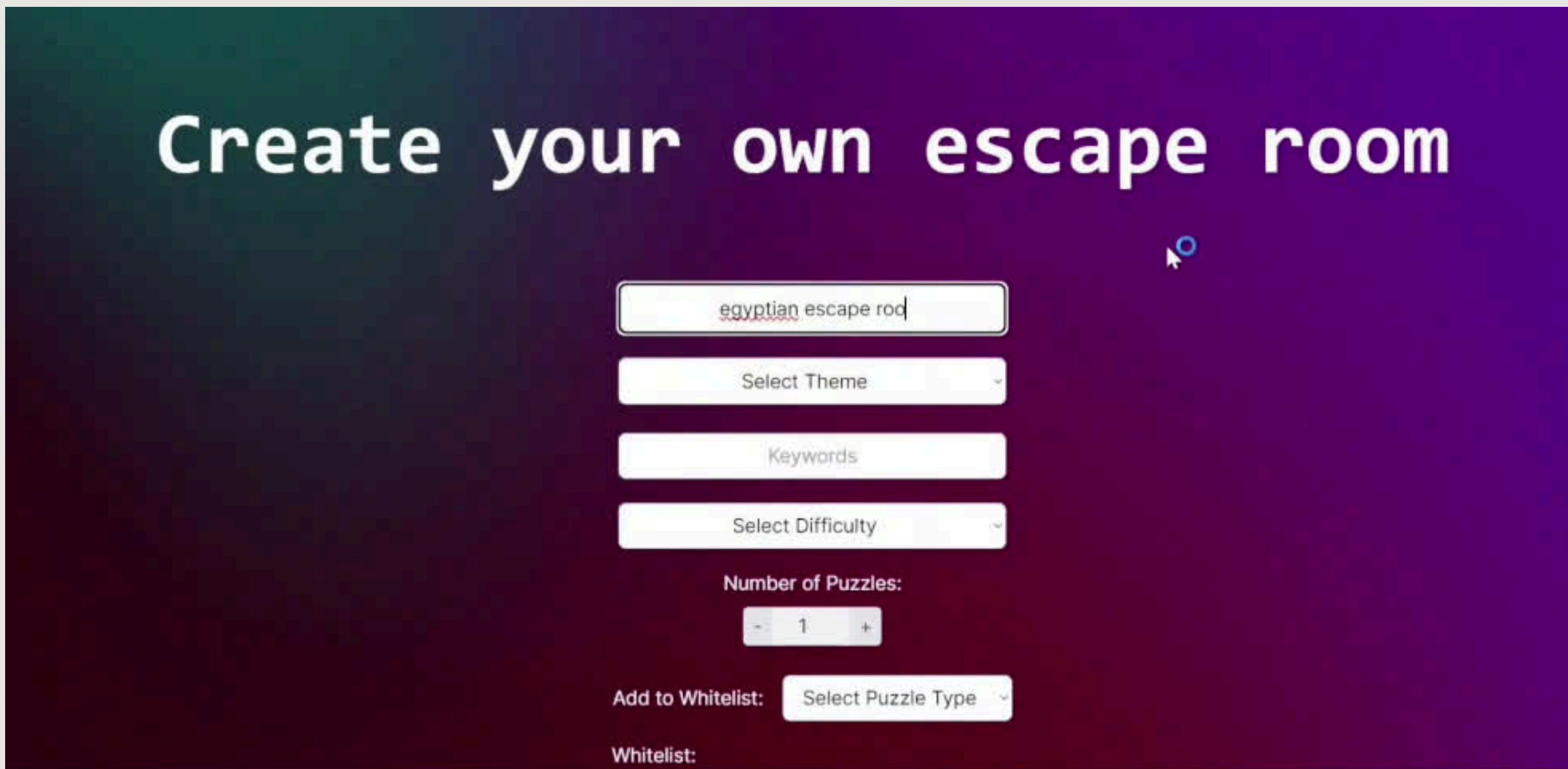
# *Area of improvement:*

## *Performance*

Factors that contribute to slow performance:

- Using the DoC VM
- Using Python
- Pdfs are large (approximately 20MB at minimum for completely text based puzzles) and a slow format
- Embedding images is memory intensive

# *Video demo of creation*



# *Video demo of Editing*

**Phases**

Phase 1

Puzzle: Caesar Cipher

Solution: 949123

Phase 1: Starlit Codes As you delve deeper into the pyramid, the oppressive darkness thickens, echoing the impending doom Seti-Ra's curse threatens to bring. To decipher the ancient hieroglyphs and uncover the hidden message, you must follow the celestial trail of shimmering stars above the pyramid to reveal the path to banishing Seti-Ra's malevolent spirit back to the depths of the underworld.

**Regenerate** **Edit**

## ΣΓΥΡΤ ΣΣCΔΡΣ ROOM

Greetings, brave adventurer. I am Anuket, the guardian of the ancient Egyptian realm. As you step into the hidden chambers of the pyramid, you discover that the malevolent spirit of the deposed evil pharaoh, Seti-Ka, has awakened, seeking vengeance and chaos upon the world, threatening to unleash a curse that will plunge Egypt into eternal darkness.

-- Puzzle Info --  
Difficulty: 2  
Requirements:  
Pen

### PHASE 1

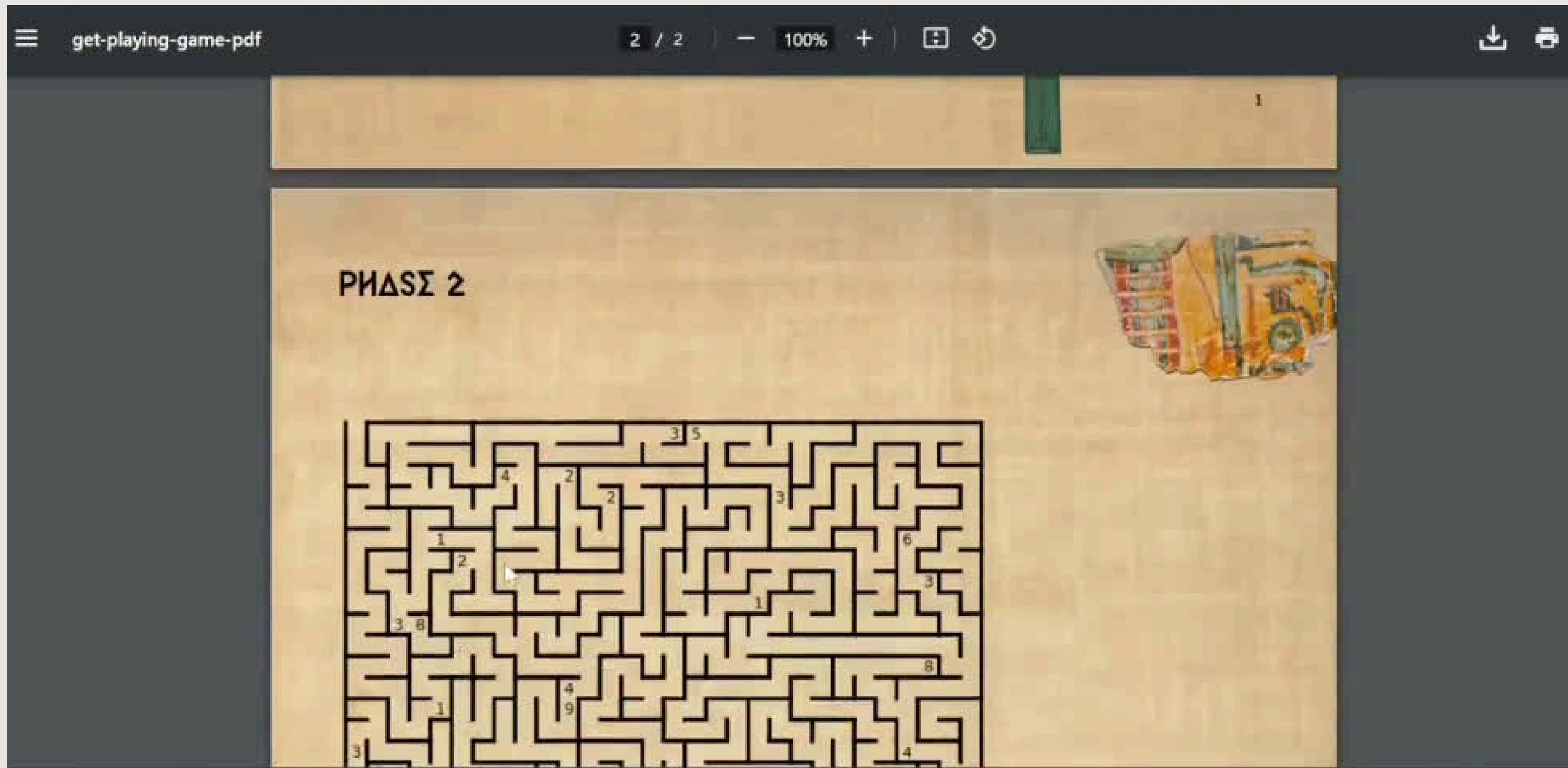
Phase 1: Starlit Codes

As you delve deeper into the pyramid, the oppressive darkness thickens, echoing the impending doom Seti-Ra's curse threatens to bring. To decipher the ancient hieroglyphs and uncover the hidden message, you must follow the celestial trail of shimmering stars above the pyramid to reveal the path to banishing Seti-Ra's malevolent spirit back to the depths of the underworld.

The great Raegan Emperor was always **YΓΥΡ** steps ahead.

**ΩΖΕC**  
**YΓΥΡ**  
**ZΥΡ**  
**EHZ**  
**EΣCPP**

# *Video demo of pdf*



# *Software Engineering Practices*



**Discord**



**Trello**

## SCRUM

- Brief daily stand-up meetings
- Longer weekly planning meetings
- Pair programming