algorithmics

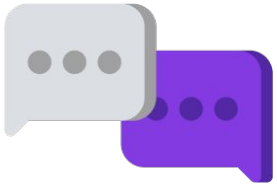
Module 2. Lesson 6.

Memory Card Application P. 4

Link to the methodological guidelines

Discussion:

Memory Card Application



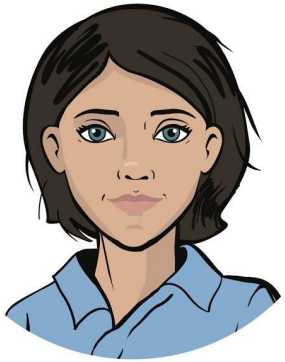
Finalizing work on the order

We've been working on a project for the "Citizen of the World" Cultural Center for several weeks.

The basic functionality is already programmed.

All that remains is to introduce a couple of interesting mechanics and prepare the product presentation.

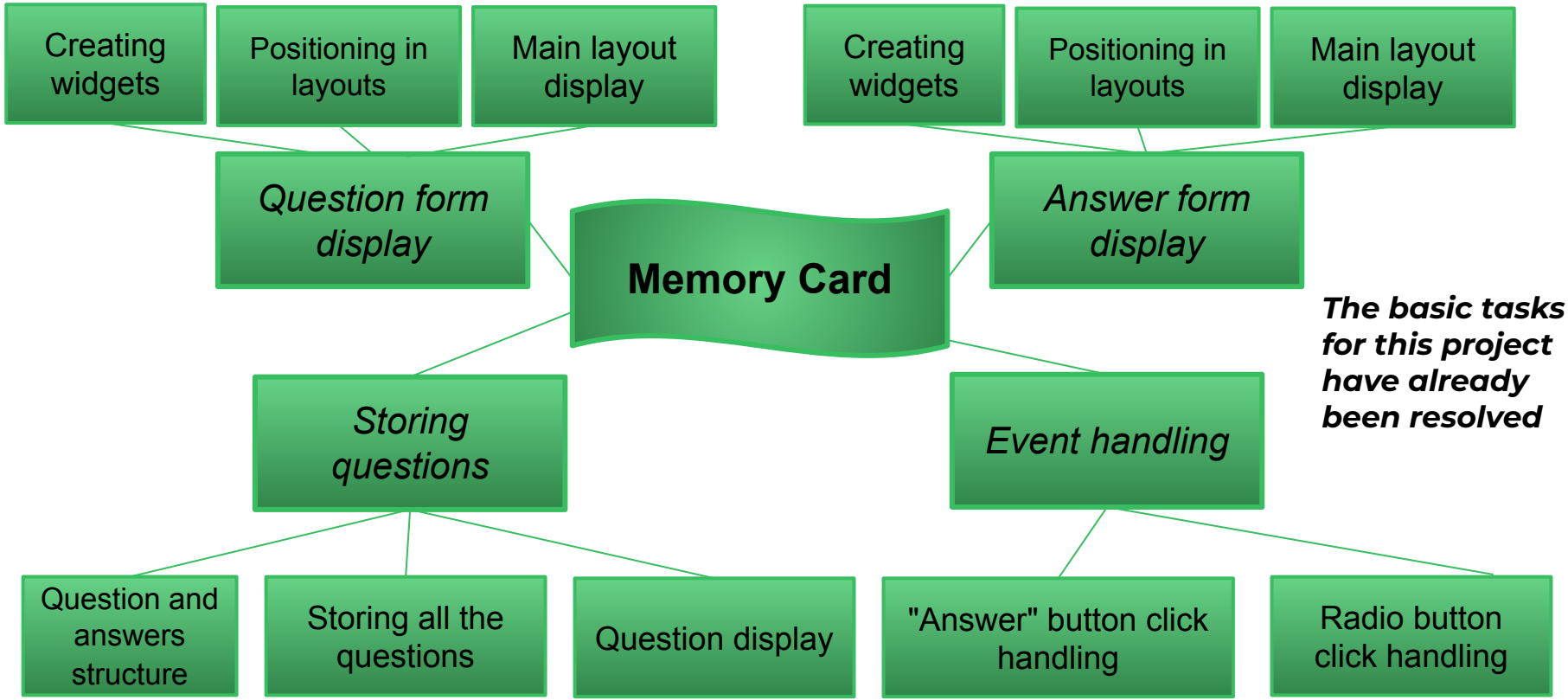
Are you ready to continue working?



Emily,
Project Manager

Discussion of work tasks

Let's consider the project mind map



The basic tasks for this project have already been resolved

Software development stages

The software development process is actually much broader.

Today, we will not only complete the project, but also test how it works and make a presentation for the customer.

What stages of work on a project (commercial product) do you know?

Discussion of work tasks

Software development stages

Product **idea**.
Receiving an order

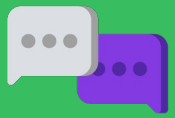
Design
Prototyping

Prototyping Developing a basic version of the product.

Finalizing the product according to the client's wishes

Product **testing**.

Presenting the product to the customer.



Discussion of work tasks

Software development stages

Product **idea**.
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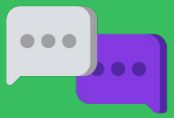
Presenting the product to the customer.

Tasks for the work day



Discussion of work tasks

Software development stages

Product idea.
Receiving an order

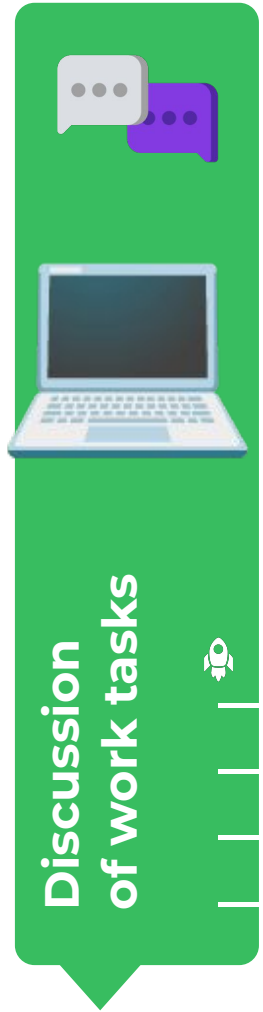
Design.
Prototyping

Developing a basic version of the product.

Finalizing the product according to the customer's wishes

Product testing.

Presenting the product to the customer.



Software development stages

Product idea.
Receiving an order

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Developing a basic version of the product.

Finalizing the product according to the customer's wishes

Product testing.

Presenting the product to the customer.

Tasks for the work day

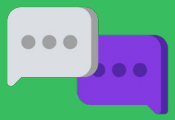
Discussion of work tasks

The goal of the working day is

to complete our work on the Memory Card Application and present it to the customer.

Today you will:

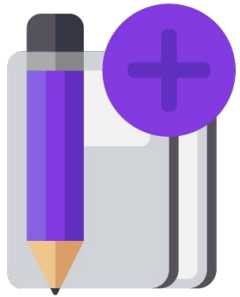
- Finalize the app according to the customer's wishes.
- Test how the app works.
- Make a presentation of the project for the customer!



Discussion of work tasks

Brainstorming:

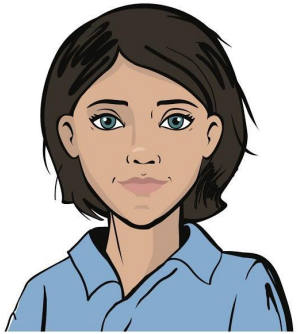
Finalizing the App



The customer's wishes

Yesterday, I showed the first version of the product to the customer, and they asked us to add two mechanics:

- **Displaying the questions in a random order**. The customer wants the questions to be chosen randomly from the list instead of always being asked in the same order.
- **Collecting answer statistics and displaying them to the console**. The number of correct answers and the employee's rating are useful for assessment.



Let's start with displaying questions.

Brainstorming

Random order of questions

Task. Finalize the Memory Card Application. The program must ask questions, not in order (as they are in the list), but randomly.

Brainstorming

How do we modify the program?

Random order of questions

Task. Finalize the Memory Card Application. The program must ask questions, not in order (as they are in the list), but randomly.

Brainstorming

next_question() is responsible for displaying the first and next questions:

- The app window property window.cur_question is no longer needed.
- Instead, we introduce the cur_question variable locally (in the function scope)

Random order of questions

Task. Finalize the Memory Card Application. The program must ask questions, not in order (as they are in the list), but randomly.

next_question() is responsible for displaying the first and next questions:

- The app window property window.cur_question is no longer needed.
- Instead, we introduce the cur_question variable locally (in the function scope):

A fragment of the function:

```
cur_question = randint(0, len(questions_list) - 1)
q = questions_list[cur_question]
```

cur_question is the number of the current question.

It is **a random number within the list.**

Brainstorming

Changes in the program:

```
class Question():
```

Class description

App interface

Functions displaying a question

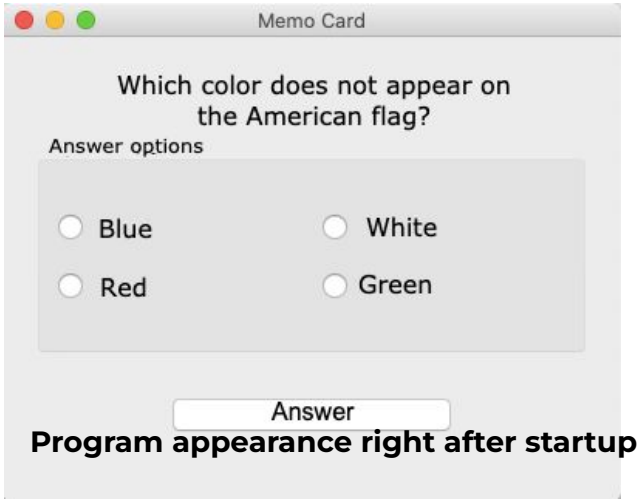
```
def next_question():
```

Modified body with a random question number cur_question

Creating a window, running the app

Handling clicking on btn_OK with the click_OK function

```
questions_list = []
questions_list.append(Question('The state language of Brazil', 'Portuguese', 'English', 'Spanish',
'Brazilian'))
questions_list.append(Question('Which color does not appear on the American flag?', 'Green', 'Red', 'White',
'Blue'))
questions_list.append(Question('A traditional residence of the Yakut people', 'Urasa', 'Yurt', 'Igloo',
'Hut'))
```



Program appearance right after startup

Brainstorming

Statistics collection and rating calculation

Task. Add statistics and rating output to the console. Statistics means the current number of questions asked and correct answers given. Calculate the rating using the formula:

$$Rating = \frac{Number\ of\ correct\ answers}{Number\ of\ questions\ asked} 100$$

```
Statistics
-Total questions: 1
-Correct answers:
Statistics
-Total questions: 1
-Correct answers:
Rating: 100.0%
```

Statistics after a correct answer to one question

Brainstorming

Statistics collection and rating calculation

Task: Add statistics and rating output to the console. Statistics means the current number of questions asked and correct answers given. Calculate the rating using the formula:

$$Rating = \frac{Number\ of\ correct\ answers}{Number\ of\ questions\ asked} 100$$

Let's introduce **two accumulators**: one for all the questions (**total**) and one for correct answers (**score**).

To access them from different functions, let's make them window properties.

Brainstorming

Statistics collection and rating calculation

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To access them from different functions, let's make them window properties:

Let's reset the accumulators when starting the program:

```
btn_OK.clicked.connect(click_OK)
window.score = 0
window.total = 0
next_question()
```

Brainstorming

Statistics collection and rating calculation

Task: Add statistics and rating output to the console. Statistics means the current number of questions asked and correct answers given. Calculate the rating using the formula:

$$Rating = \frac{Number\ of\ correct\ answers}{Number\ of\ questions\ asked} 100$$

The **window.total** accumulator is incremented when a new question is displayed:

```
def next_question():
    window.total += 1
```

The **window.score** accumulator is incremented when a new question is displayed:

```
def check_answer():
    if answers[0].isChecked():
        show_correct('Correct!')
        window.score += 1
```

Brainstorming

Statistics collection and rating calculation

Task: Add statistics and rating output to the console. Statistics means the current number of questions asked and correct answers given. Calculate the rating using the formula:

$$Rating = \frac{Number\ of\ correct\ answers}{Number\ of\ questions\ asked} 100$$

The **window.total** accumulator is incremented when a new question is displayed:

```
def next_question():
    window.total += 1
```

Statistics output when the value changes.

The **window.score** accumulator is incremented when a new question is displayed:

```
def check_answer():
    if answers[0].isChecked():
        show_correct('Correct!')
        window.score += 1
```

Statistics and rating output when the value changes.

Brainstorming

Changes in the program:

```
class Question():
```

Class description

App interface

```
def check_answer():
```

Modified body with window.score accumulator and statistics and ratings printing

```
def next_question():
```

Modified body with window.total accumulator and statistics printing

Creating a window, running the app

Accumulators initialization, btn_OK click handling

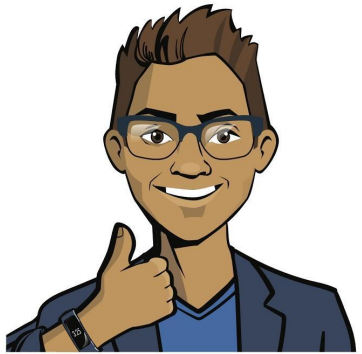
Statistics
-Total questions: 5
-Correct answers: 3
Statistics
-Total questions: 5
-Correct answers: 4
Rating: 80.0%
Statistics
-Total questions: 6
-Correct answers: 4

Brainstorming

Expected result:

- ❏ At least three questions with answer options have been added to the app.
- ❏ The app displays the questions in random order.
- ❏ The app is calculating user statistics and ratings non-stop.

  The results are output to the console.



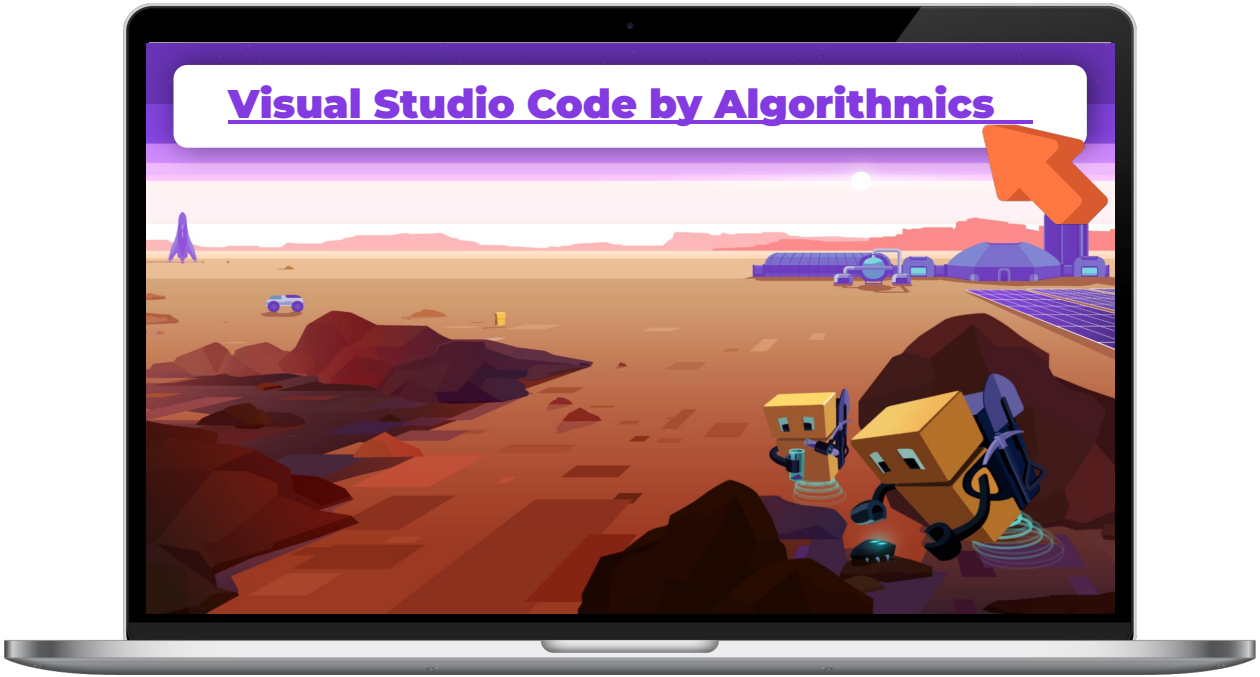
Brainstorming

Visual Studio Code:

Memory Card Application

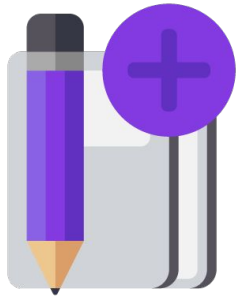
Complete the task in VS Code

“VSC. PyQt. Memory Card”



Brainstorming:

Finalizing the Project



Software development stages

Product idea.
Receiving an order

Design.
Prototyping

Developing a basic version of the product

Finalizing the product as per the customer's wishes

Product testing

Presenting the product to the customer

Brainstorming

Product testing

There are different approaches to testing. For our Memory Card project, testing will be as follows:

Stage Name	*Essence*
Preliminary stage	**At least 10 questions** on the subject given by the customer are added to the program.
Self-testing	The developer starts the app and interacts with it as a user: - **External attributes test** (randomizing questions and answer options, displaying the correct answer) - **Functionality test** (correct statistics calculation)
Third-party testing	The project is **given** to **another specialist** for testing. They check how the program works and provide feedback.

Brainstorming

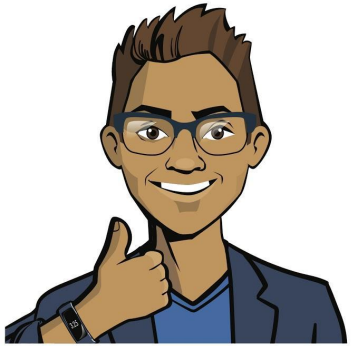
Presenting the product

In addition to implementing a project, a good developer must also be able to present the result to the customer.

A report on the work done will be sent to the "Citizen of the World" Center ***via the Laboratory.***

We will need to:

- ❏ Arrange the results of our work visually.
- ❏ Demonstrate important mechanics.
- ❏ Demonstrate test results.



Brainstorming

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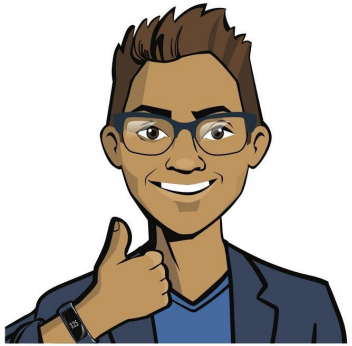
For a short and effective presentation you can use:

- graphics editors
- presentation apps
- video editing

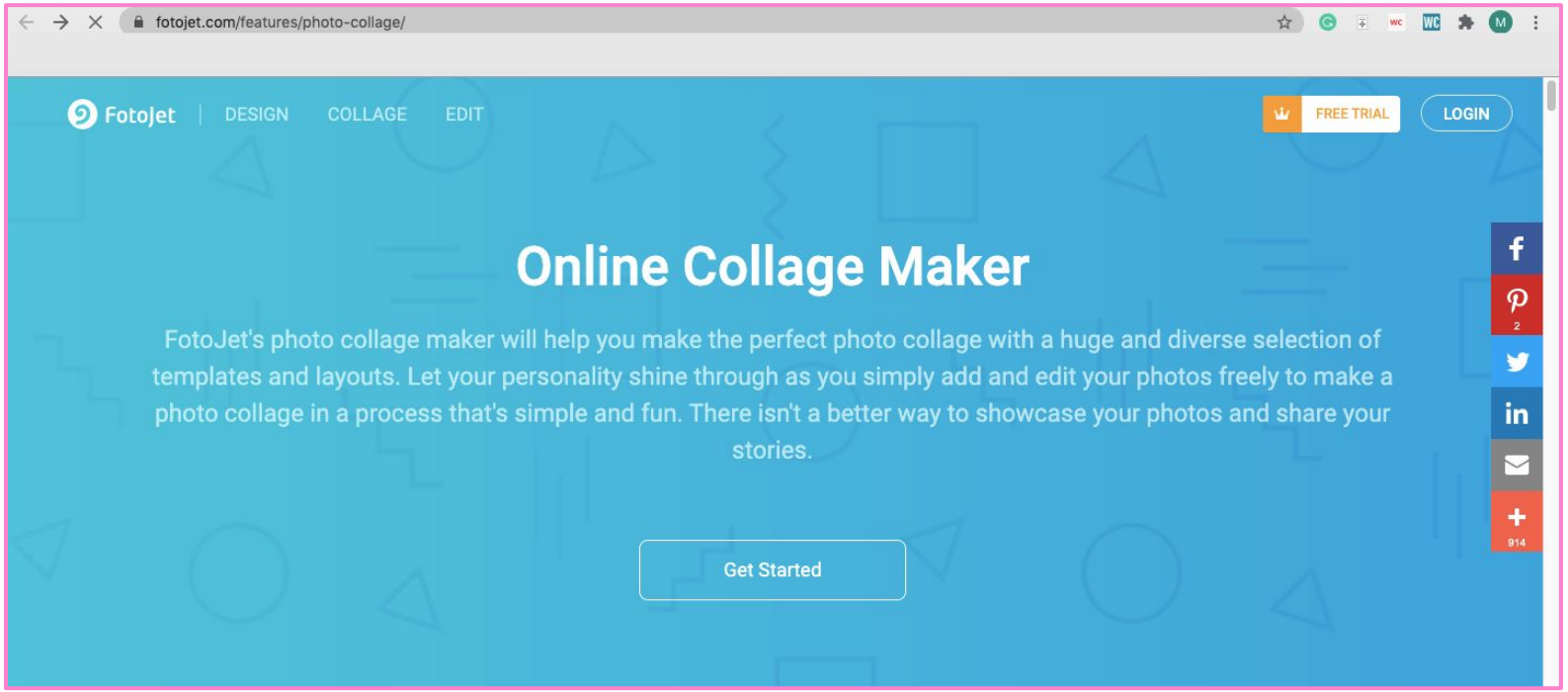
and any other tools!



Brainstorming

Presenting the product

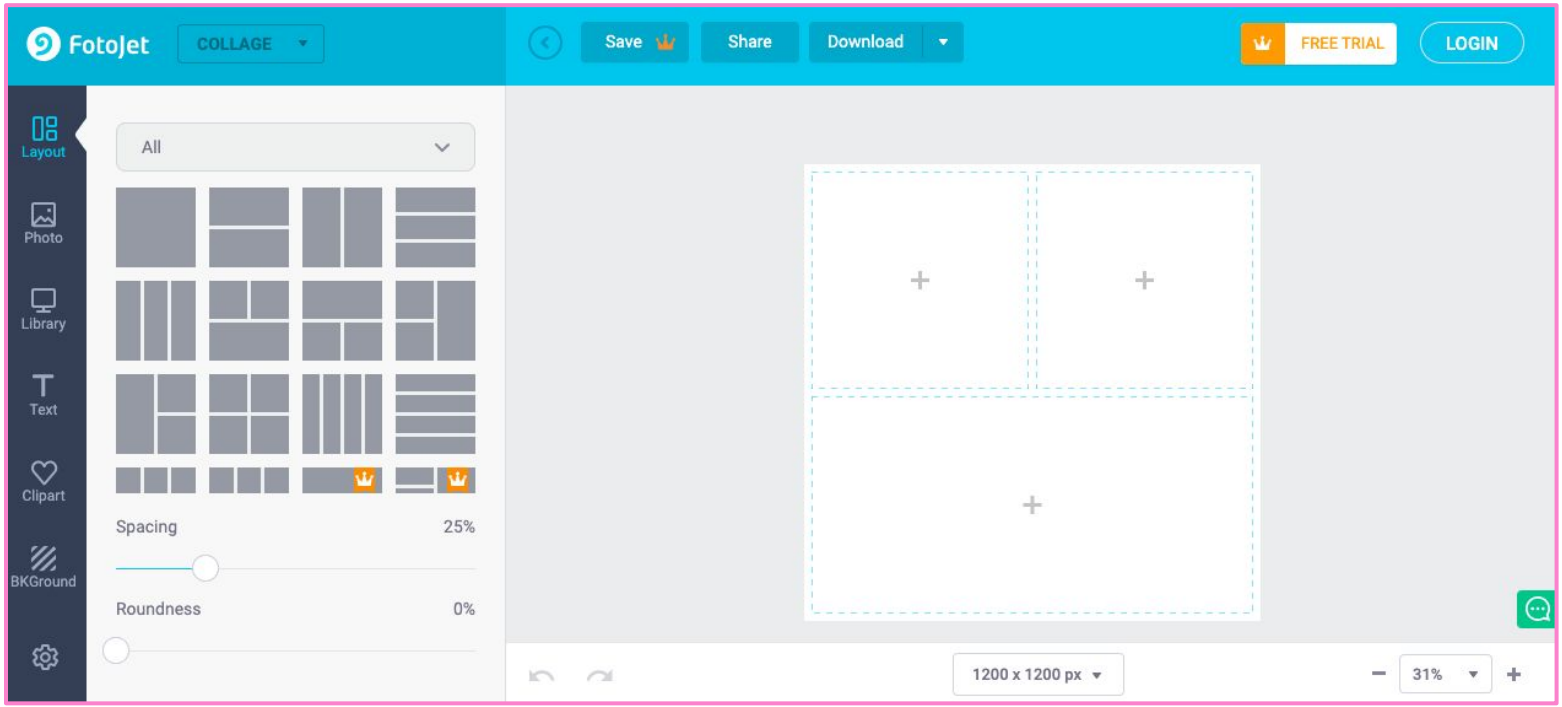
One possible tool for presenting the work you have done:



Brainstorming

Presenting the product

The program interface and how it works can be presented in a collage.



Brainstorming

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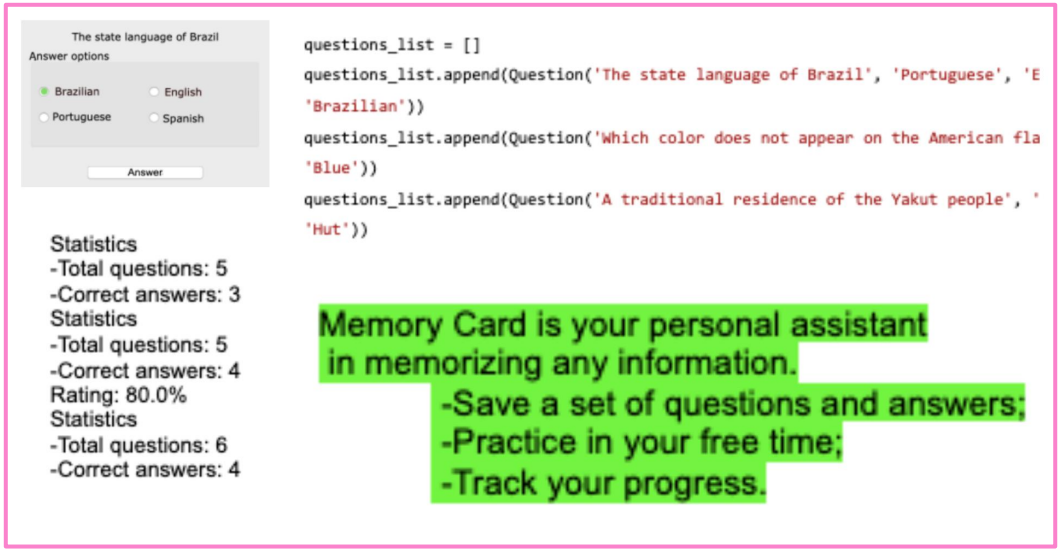


Explain the purpose of the app.

Demonstrate the interface elements.

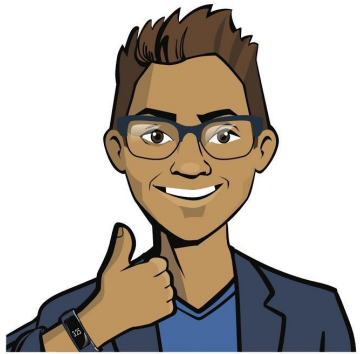
Show off the key mechanics.

Report the test results.

"Brainstorm"

Work plan:

- ❏ Test the app, first independently, and then together with another developer.
- ❏ Arrange the result of your work, download and publish a presentation in the Laboratory.
- ❏ Study the presentations of your colleagues and leave feedback (comments under the publication).



Brainstorming

Laboratory:

Testing and Presentation

Publish the result in the Laboratory

Share the result of your work with customers and colleagues in the Laboratory

Wrapping up the work day

Dear developers, share the results of your work!

1. Introduce yourselves. Tell us what project you have been working on. What target audience is it designed for?
2. Show off the result of your work. Has the product been tested? What limitations does it have?
3. What interesting mechanics does the project have? What is its competitive advantage?

Wrapping up the work way

Congratulations on delivering a big commercial order!

Answer these questions with your colleagues:

1. What was the best thing you managed to do?
2. What didn't work out the way you wanted?
3. What should you do next time to ensure success?

Wrapping up the work way