

CSCE606 - Team TensorFlow

Biology Games 2

Final Report

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Team Members:

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Summary:

For this project, we deployed legacy code to WordPress site and implemented a new word game, the Gravity Game.

- Customer Need: The customers first wanted us to deploy the legacy games on a WordPress site instead of the StepStone environment, which was what the previous team had used. They also wanted us to deploy games across modules, using almost identical code for the different modules. Then, the customer wanted us to develop some new games that can be used to teach middle school students biology knowledge. In our completed project, we were able to deploy games across all modules. The only difference in codes in different modules were the question sets, which were separated in json files and made it easy to modify. We were able to find a plugin for the WordPress website and the customer can simply download our codes and upload them to the plugin from their end. We've also developed a new word game, the Gravity Game, which can help students memorize biology terminologies and their spellings.
- Stakeholders: The stakeholder for this project is the Veterinary Medical & Biomedical Science department at Texas A&M University. The project will eventually be used for local middle school biology classes. We've been meeting with Dr.Walker as the customer.

User Stories:

Feature: Deploy games across modules

As a user, I want to be able to play the crossword game and the picture game in all modules using almost the identical codes.

- Points: 1
- Status: Completed, iteration 1-2
- After examining the legacy code, we decided that in order to deploy games across all modules, one can simply copy the crossword game code over to a different module and change the questions and answers in crosswordeeasy.html, crosswordmedium.html and crosswordhard.html. To deploy the picture game, the questions and answers need to be changed in controller.js.
- In our implementation of Gravity Games, we made this process even easier. The questions and answers can be found in a separate json file, which makes the updating question process less complicated.

Feature: Deploy games on a website instead of stepstone

As a user, I want to be able to deploy the game on the peer.tamu.edu WordPress website instead of the StepStone environment

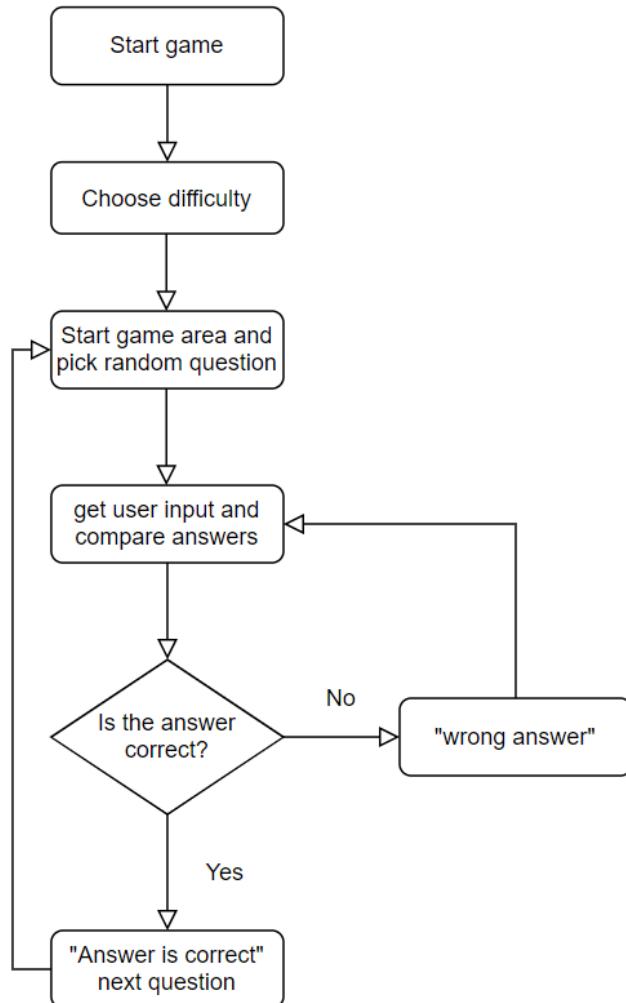
- Points: 2
- Status: Completed, iteration 1
- For this user story, we worked with the webmaster for this project, Harshita Chaudhary. At the beginning of the implementation, we were able to find a plugin for WordPress, "wp-file-manager". This allows the customer to simply download our code and then upload to their end's plugin to deploy the games online. At first, Harshita had some disagreements with this method but later in this iteration, she informed us that this method worked for her and we can complete the user story.

Feature: Develop new word games

As a user, I want to have more word games on the website

- As we started iteration 2, we realized that this user story is too big and generic. Therefore we broke the user story down into 4 smaller user

stories listed as below. A design diagram is also included in this to explain the logic of the game



Feature: Develop timer for new game

As a user, I want to use a box that is dropped as time passes by as a timer for the game

- Points: 2
- Status: Completed, iteration 2
- For this user story, we implemented a game area in controller.js with styling in multiple html files. We set 3 difficulties, which is realized by having the box dropping at different speeds.

Feature: Take user input for questions

As a user, I want to be able to type my answer into a textbox

- Points: 2
- Status: Completed, iteration 2
- For this user story, we implemented an input text box right below the gaming area. The users are able to type their answers and click the submit button to check if their answers are correct. The code changes all answers to lowercase to compare them so the user can input in both uppercase and lowercase.

Feature: Give new question after answer a question correctly

As a user, I want to be given a new question when I answer the question correctly

- Points: 1
- Status: Completed, iteration 2
- For this user story, we implemented a “next” button that appears when the user answers a question correctly, incorrectly, and when the time is up. Clicking the next question button will take the user to the next question.

Feature: Game ends when time is up

As a user, I want to be notified when the box is at the bottom / when time is up

- Points: 1
- Status: Completed, iteration 2
- For this user story, a popup window will show up when the box hits the bottom/when time is up. A next question button will show up to take the user to the next question.

Feature: Develop new picture games

As a user, I want to have more picture games on the website

- Points: 6
- Status: Never Started
- This user story was never started due to the lack of project time this semester.

Game UI:

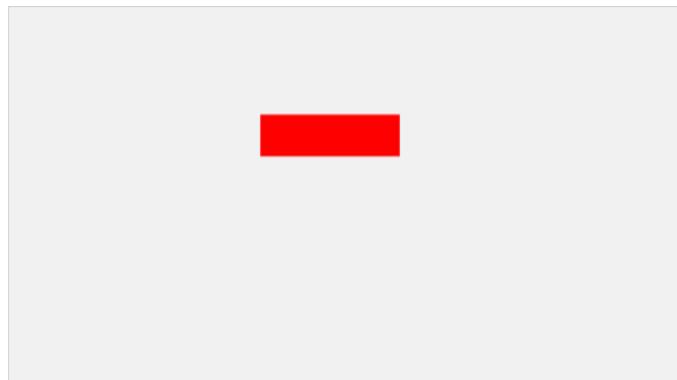
- Choose difficulty level

Gravity Game

Select the game difficulty level:

Easy Medium Hard

- Game area



Gravity Game

Question: 1 out of 9

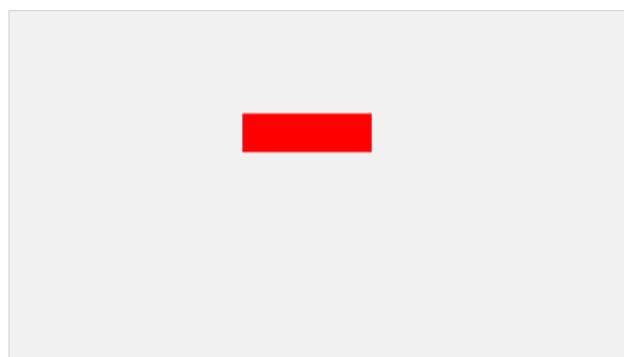
Score: 0 out of 9

What is the logical problem-solving approach used by scientists?

Your Answer

Submit

- Correct answer



Gravity Game

Question: 9 out of 9

Score: 1 out of 9

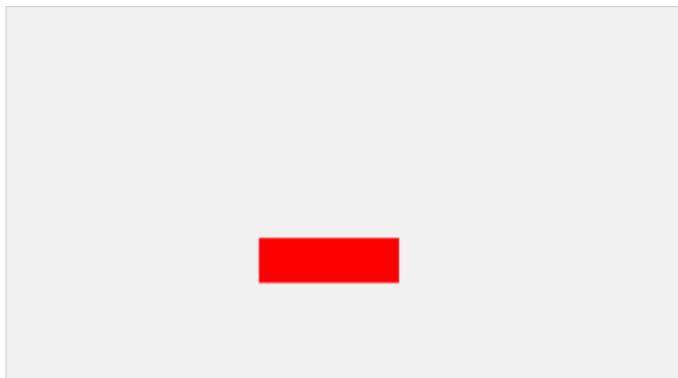
How many phases are there in clinical trials?

Four

Correct Answer

Finish Quiz >>

- Wrong answer



Gravity Game

Question: 1 out of 9

Score: 0 out of 9

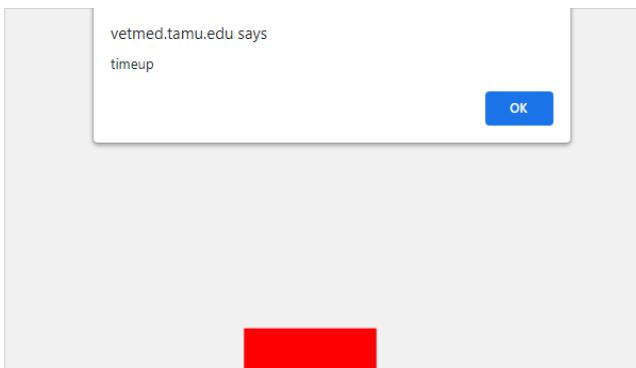
What is the logical problem-solving approach used by scientists?

The scientific method

Wrong Answer

[Next Question >>](#)

- Time ends



Gravity Game

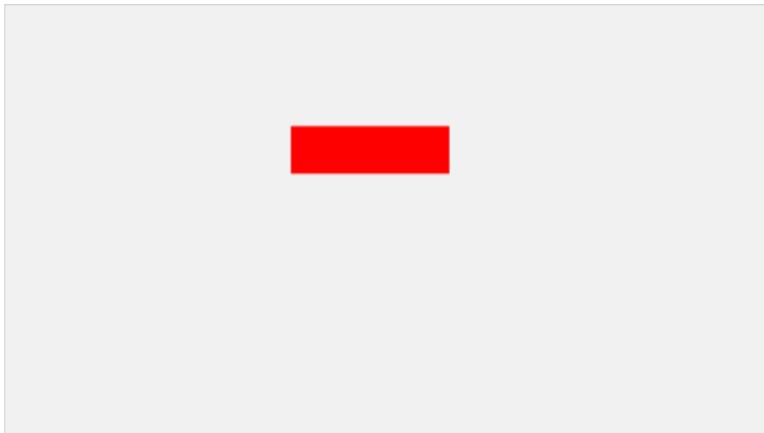
Question: 8 out of 9

Score: 0 out of 9

_____ is the process by which patients are assigned a group of the clinical trial.

Your Answer

- End of quiz



Gravity Game

You have reached the end of the quiz !!!!!

Questions encountered: 9

You got 1 correct.

Legacy Project:

- This project was started by team SeverGers in Fall 2020 semester. For iteration 0, we focused on reading through the legacy code and understanding them. We then decided that the legacy code doesn't need to be touched for our user stories, as developing a new game doesn't interfere with the games that already exist. Deploying the game onto WordPress also doesn't require changes in the existing code. We did use some reference from the picture game code to implement our Gravity Game's user interface.

Team Roles:

- We chose different scrum masters and product owners for each iteration so all of the team members can have experience with them.

Iteration 0:

Scrum Master: Jiateng Sun Scrum Master: Tzu-Shen Wang Scrum Master: Zhenlei Song

Iteration 1:

Product Owner: Jinjin Jiang

Product Owner: Lu Zhang

Iteration 2:

Product Owner: Zhihao Li

Iteration Summary:

- **Iteration 0:**
 - For iteration 0, the team focused on understanding the legacy code and communicating with the customers to create user stories. Based on the meeting with Dr.Walker, we created 4 user stories.
 - Points completed: 0
- **Iteration 1:**
 - In this iteration, the team focused on deploying the existing code to WordPress instead of using StepStone. We had several meetings with the webmaster of this program, Harshita and discussed her expectations for us. At first, Harshita expected us to use plugins and shortcodes. However, the team found another plugin, “wp-file-manager”, that made the process easier. We informed Harshita about this plug in and she reached out later and agreed to change the method to “w]-file-manager” plugin.
 - For this plugin to work, one can simply download the local wordpress server and the plugin, and then upload the code files to the plugin.
 - Points completed: 2
- **Iteration 2:**
 - In this iteration, the team implemented a new word game, the Gravity Game. We were able to complete 4 user stories. We implemented a timer by presenting it as a dropping red rectangle, and indicated time is up with a popup window when the red rectangle hits the bottom of the game area. We decided to take user inputs from a textbox and compare the input with answers from the question set. The game will tell the user if the answer is correct or not after the user clicks the submit button. And we implemented a button to take users to the next question when appropriate. We also implemented a scoreboard that keeps track of the user’s current score.
 - We’ve also created manual test cases, since Dr.Walker suggested that it is difficult to test javascript files in the current environment.
 - Points completed: 6

Customer meetings:

- We've been meeting with Dr.Walker as our customer.
- Meeting 1, 04/08/2021
 - In this meeting, we focused on understanding the customer's expectations for this project.
 - Dr.Walker also provided some ideas of the new games that could be implemented in this project

- Meeting 2, 04/15/2021
 - In this meeting, we discussed the user stories that were created. Dr.Walker approved the user stories.
 - We also gave a short demo of what we've done for iteration 1, which was deploying the games on WordPress. We also informed Dr.Walker that we've been working with Harshita on this iteration.
- Meeting 3, 04/22/2021
 - During this meeting, we discussed the strategies we were going to use to implement the new game. We demoed our user story and lo-fi mock UI, which were approved by Dr.Walker.
 - Dr.Walker suggested we break the user story down, since the user story we had was too generic.
- Meeting 4, 04/29/2021
 - We gave a demo of our new word game, the Gravity Game. We presented the situations when the input answer is correct, incorrect, and when time is up. We also presented our manual test cases and screenshots corresponding to each one of them.
 - We also informed Dr.Walker that we would be keeping working with Harshita to deploy our new game on WordPress too.

BDD/TDD Process:

- Due to the difficulty to implement test cases within Javascript code on websites, Dr.Walker suggested us to create manual test cases for iteration 2 when we developed the new Gravity Game.
- We first developed a few test cases to help us to implement the basic game area, and we focused on passing these at the beginning of the developing process in iteration 2. The test cases are listed below:
 - Test Case: When I entered Gravity Game, I should see a page to select difficulty level
 - Test Case: When I enter Gravity game, I should see a moving red square, a question and an input textbox
 - Test Case: When I stay on the gravity game page, I should see the red square falling towards the bottom of the page
- After passing the above tests, we had the basic game area and GUI ready. Then, we developed a test case to help with the first user story, developing a timer
 - Test Case: When the red square falls to the floor, I should see a notification saying time is up
- After successfully passing this test, we developed more tests to focus on the answer comparison part of the game.

- Test Case: When I enter the wrong answer, I should see a notification saying wrong answer and the red square should keep falling
 - Test Case: When I enter the correct answer, I should see a notification saying correct answer and take me to the next question
- We also made sure that the answer comparison features worked in different scenarios.
 - Test Case: When I enter the correct answer when the red square just starts falling, I should see a notification saying correct answer and a button taking me to the next question
 - Test Case: When I enter the correct answer when the red square falls half way through, I should see a notification saying correct answer and a button taking me to the next question
 - Test Case: When I enter the correct answer when the red square almost falls to the bottom, I should see a notification saying correct answer and a button taking me to the next question
 - Test Case: When I enter numbers or special characters, I should see a notification saying wrong answer and the red square should keep falling
- Then, we created test case to see if the game ended properly
 - Test Case: When I finish all questions, I should see a page marking the end of the game and showing my score.
- During the process of testing, we failed several times but we then went back to the code and debugged/added features. We eventually passed all test cases and concluded our testing process.

Configuration Management:

- We started the project by forking the legacy code GitHub repository to our public repository. All members of the team were added as collaborators.
- At the beginning of each iteration, we had meetings as a team to discuss the goal of this iteration. The team members would brainstorm methods or ideas to complete the user story. The tasks were then divided among members and each person or small group of people would focus on their part of the project.
- We would inform team members about what we achieved in the group chat before pushing the code to the GitHub repository. After everyone approved the implementation, we would then push the code to our repository.
- We would use at least the last two days of the iteration cycle to test/fix bugs.
- We encouraged team members to give updates on their tasks and reach out for help if they encountered any difficulties completing the tasks.
- The product owner was responsible for reviewing the final product of the iteration to make sure the implementation met the customers' expectations.

- We also had weekly meetings with the customer to give presentations of what we achieved during the previous iteration, and the user story we planned on implementing for the next iteration.

Issues with Production Release on Heroku:

- Heroku was not used during the project since we deployed the games on WordPress Website.

Issues with other tools:

- We did not encounter any issues with the tools we used.

Other tools used:

- We used WordPress and WordPress plug in, “wp-file-manager” for this project. The benefit of the plugin we used was that it was easy to operate. One can simply upload the code to the plugin to deploy the code online.

Links:

- Pivotal Tracker: <https://www.pivotaltracker.com/n/projects/2495359>
- GitHub: <https://github.com/laosong-2020/BiologyGames>
- Heroku: N/A

Links to Poster and Demo Videos:

- <https://youtu.be/kSe9Fp5gKxQ>

Instructions on how to download WordPress and plugin:

- Start the local wordpress server, then create a new development website



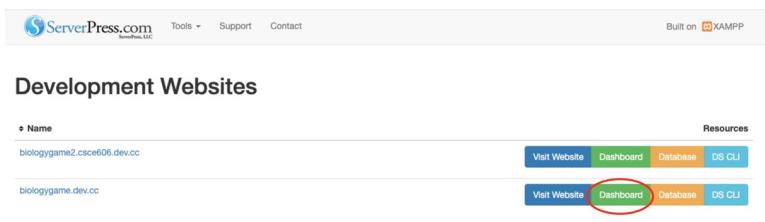
- Customize the name of the website. Here, we choose biologygame.



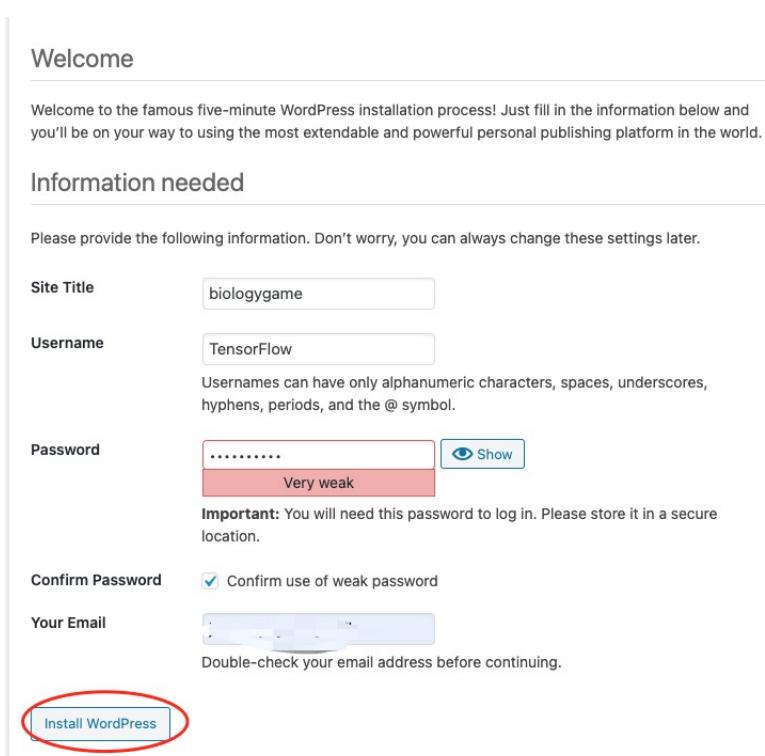
- Customize the site title, username and password. Then choose to install WordPress.



The screenshot shows the DesktopServer Limited application window. At the top, it says "DesktopServer Limited - v3.9.4". Below the title is a large blue "S" logo followed by the text "DesktopServer" and "for Professional WordPress Development". A subtext below reads: "DesktopServer makes it easy to create a local WordPress website for fast desktop development. To get started, simply select an option below:". There are three radio button options: "Stop or restart the web and database services.", "Remove, copy or move an existing website.", and "Create a new development website." The third option is selected. At the bottom of the main window are buttons for "Sites", "Close", and "Next >".

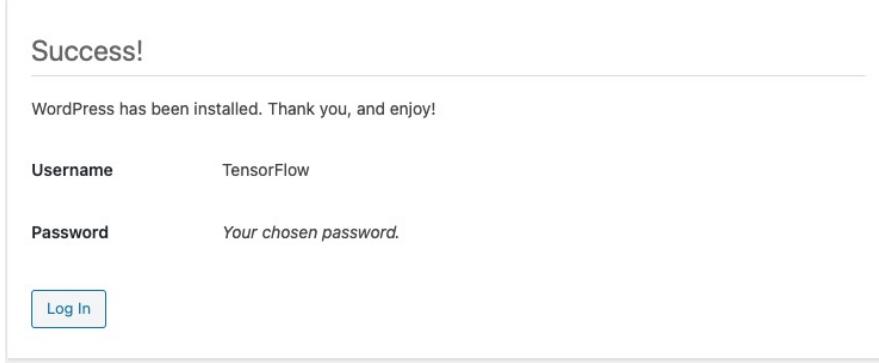


The screenshot shows the "Development Websites" section of the ServerPress.com dashboard. It lists two websites: "biologygame2.csce606.dev.cc" and "biologygame.dev.cc". Each website entry has four buttons: "Visit Website", "Dashboard" (which is highlighted in green), "Database", and "DS CLI". Below the list, it says "Total Websites: 2".

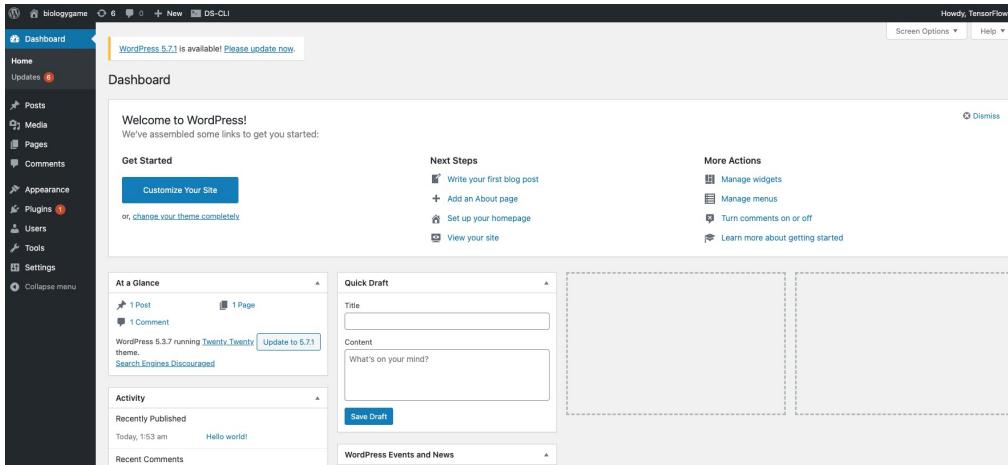


The screenshot shows the "Welcome" screen for the WordPress installation. It says: "Welcome to the famous five-minute WordPress installation process! Just fill in the information below and you'll be on your way to using the most extendable and powerful personal publishing platform in the world." Below this, there's a section titled "Information needed" with fields for "Site Title" (biologygame), "Username" (TensorFlow), and "Password" (a redacted field showing "Very weak"). A note says: "Usernames can have only alphanumeric characters, spaces, underscores, hyphens, periods, and the @ symbol." Below the password field, it says: "Important: You will need this password to log in. Please store it in a secure location." There's also a checked checkbox for "Confirm use of weak password". The "Your Email" field is empty with a placeholder "Double-check your email address before continuing.". At the bottom is a large blue "Install WordPress" button, which is circled in red.

- Log in to the admin dashboard.

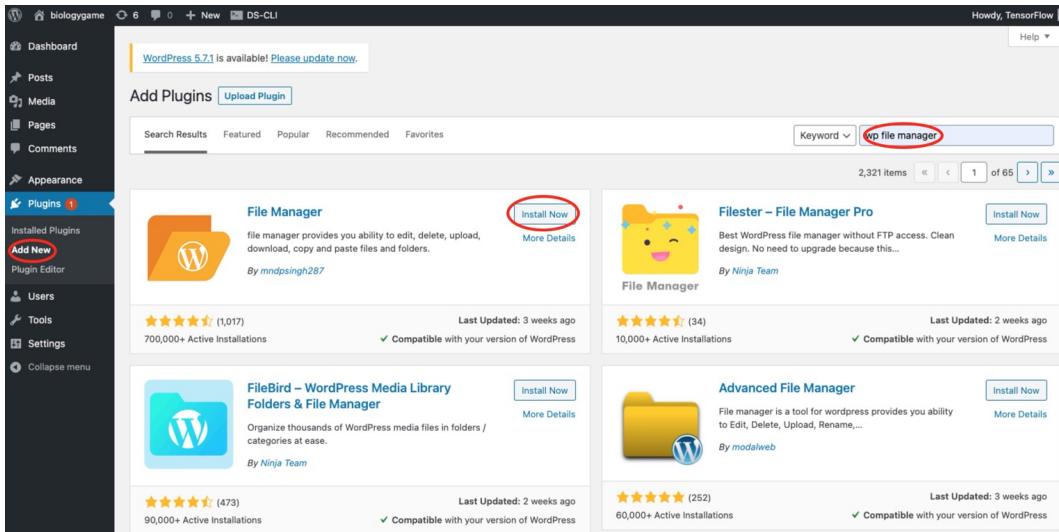


The screenshot shows the WordPress login page with a "Success!" message at the top. Below it, the "Username" field contains "TensorFlow" and the "Password" field contains "Your chosen password.". A blue "Log In" button is visible.



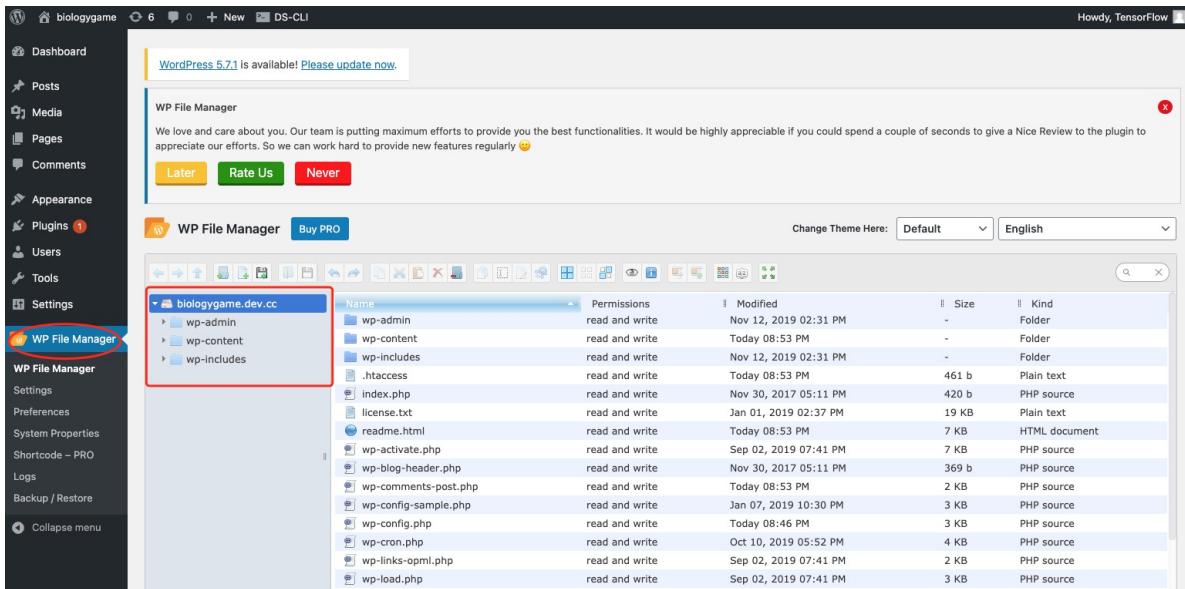
The screenshot shows the WordPress dashboard. At the top, there's a message about WordPress 5.7.1 being available. The dashboard features several sections: "At a Glance" (1 Post, 1 Page, 1 Comment), "Quick Draft" (Title, Content, Save Draft), "Get Started" (Customize Your Site, or change your theme completely), "Next Steps" (Write your first blog post, Add an About page, Set up your homepage, View your site), and "More Actions" (Manage widgets, Manage menus, Turn comments on or off, Learn more about getting started). The left sidebar includes links for Home, Posts, Media, Pages, Comments, Appearance, Plugins (with 1 update), Users, Tools, and Settings.

- Now, let's deploy the two biology games onto the website. First, we need to install the plugin "WP File Manager", and activate it.

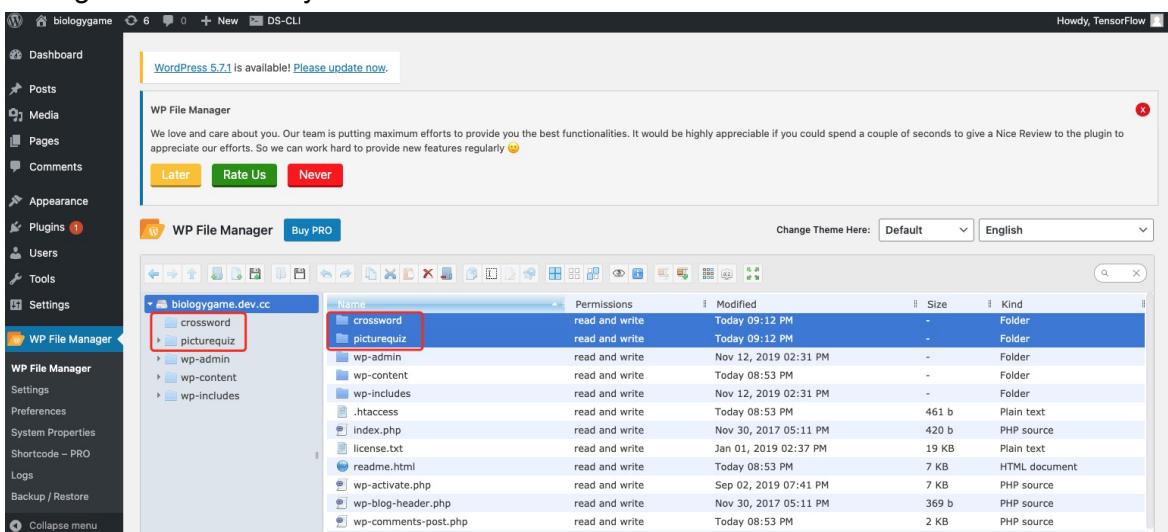


The screenshot shows the WordPress plugin search results for "wp file manager". The search bar has the text "wp file manager" with a red circle around it. The results list four plugins: "File Manager" by mndpsingh287, "Filester – File Manager Pro" by Ninja Team, "FileBird – WordPress Media Library Folders & File Manager" by Ninja Team, and "Advanced File Manager" by modalweb. Each plugin card shows its name, icon, rating, number of active installations, last updated date, compatibility status, and an "Install Now" button.

- Now, click “WP File Manager”.



- Put the two directories crossword and picturequiz which contain all the code into the file manager’s root directory.



- Now we can access the two games. The url of the local website is [“http://biologygame.dev.cc”](http://biologygame.dev.cc), to access crossword, use path identifier “/crossword”, to access picturequiz, use path identifier “/picturequiz”.