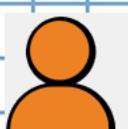
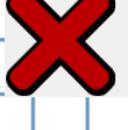


$$\log(xy) = \log(x) + \log(y)$$

-  Play
-  Sync
-  Profile
-  About
-  Exit

$$\begin{aligned}y &= \sin(x) \\y' &= \cos(x)\end{aligned}$$

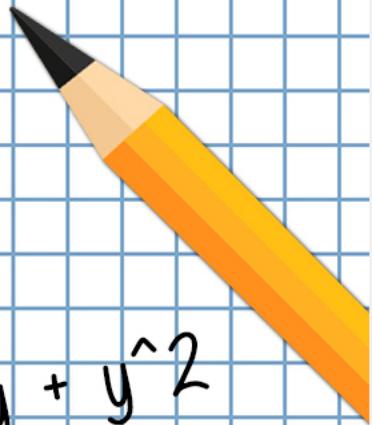
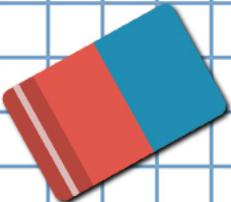
$$a^2 + b^2 = c^2$$

$$128/\text{sqrt}(e980)) = \sin(\pi)$$

$$(x+y)^2 = x^2 + 2xy + y^2$$

For instructions, go to [getting_started-AceMath.pdf](#)

AcΣMath



AcΣMath by n0miya

Program Description

You must run these commands in terminal!

1. pip install Pillow
2. pip install firebase-admin
3. pip install stopwatch.py

Program Description

Name : AcΣMath

Developer : n0miya (Dulapah Vibulsanti | ດຸລພ່າຮ່ວມບູລສັນຕິ)

Type : Puzzle Game

Name : Dulapah Vibulsanti (Judge)

Name (TH) : ດຸລພ່າຮ່ວມບູລສັນຕິ (ຈັດຈິງ)

Github : <https://github.com/n0miya>

Facebook : Judge Dulapah Vibulsanti

Line : judge_dulapah

Tel : 0819085657

Program Description

Immerse yourself into a challenging world of mathematics. Solve the problems as fast as you can to earn yourself a new record. 4 Difficulties are available for people who seek even more challenges with up to 40 questions in a single game. Play the game anytime, anywhere you want with the sync features, making sure that you will be able to earn a new record at your will.

Program Description

Game's key features:

1. Player must solve numbers of math problems based on their chosen difficulty as fast as possible.
2. Player can login to sync with Firebase database, allowing them to access their account and sync their game progress anywhere, anytime.
3. Player's best score in each difficulty will be recorded into Firebase database and player can view them anytime in the 'Profile' menu in the game, along with other player's stats.
4. Player also have an option to play offline if they do not want to sync their account.

Interfaces and Features

$$\log(xy) = \log(x) + \log(y)$$

Play

Sync

Profile

About

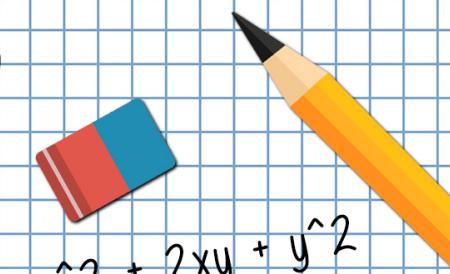
Exit

$$\begin{aligned}y &= \sin(x) \\y' &= \cos(x)\end{aligned}$$

$$a^2 + b^2 = c^2$$

AcΣMath

$$128/\sqrt(e980)) = \sin(\pi)$$



$$(x+y)^2 = x^2 + 2xy + y^2$$



Main Menu

Main Menu

Note:

- The game will start in full screen. Player can press 'F11' key to toggle full screen.
- Player can also press 'ESC' key to trigger exit confirmation dialogue.
- This game has background music.



Press this button to go to difficulty selection screen (page 10). But, if player does not login yet, the sync dialog (page 12) will appear asking player to login or play offline.



Press this button to go to sync menu (page 13). Player will have an option to create an account (page 15) or login (page 17). If there is already a user logged in, a logout dialog confirmation (page 19) will appear instead.

Main Menu



Profile

Press this button to see player's profile (page 20). Player can only access this menu when they already login or an error dialog (page 22) will appear.



About

Press this button to see information about the developer, including name, message to players, and contact (page 23).



Exit

Press this button to exit the game. A confirmation dialog (page 25) will appear.

 Back

Select your difficulty!

Easy

10 questions
1 digit integer

Normal

20 questions
2 digits integer

Hard

30 questions
3 digits integer

Expert

40 questions
4 digits integer



Difficulty
Selection

Difficulty Selection

 Back

Press this button to go back to main menu screen

Easy	Normal
10 questions 1 digit integer	20 questions 2 digits integer
Hard	Expert
30 questions 3 digits integer	40 questions 4 digits integer

Player can choose their difficulty from easy, normal, hard, and expert.

Easy – 10 questions, 1 digit integer

Normal – 20 questions, 2 digits integer

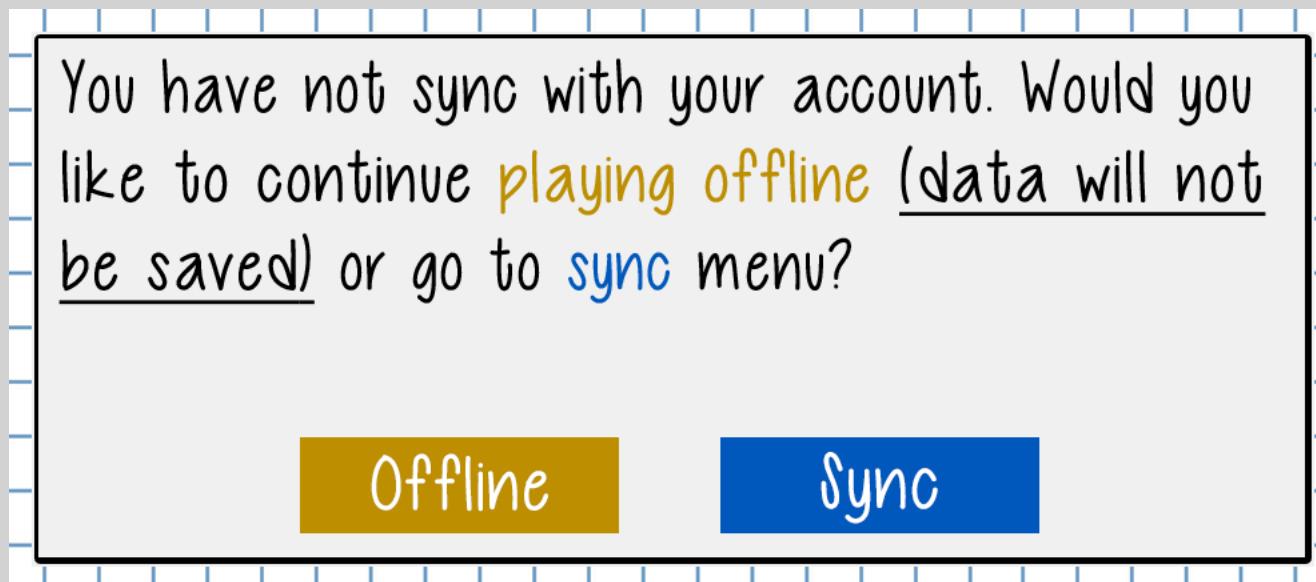
Hard – 30 questions, 3 digits integer

Expert – 40 questions, 4 digits integer

Player has no time limit, but the challenge is to solve all math problems as fast as possible.

After player has chosen the difficulty, a countdown timer (page 27) will appear before the game (page 29) will start.

Difficulty Selection – Not yet synced



If player has not login yet, this dialog will appear, asking user whether to go to sync menu (page 13) or play offline and then go to difficulty selection menu (page 10).

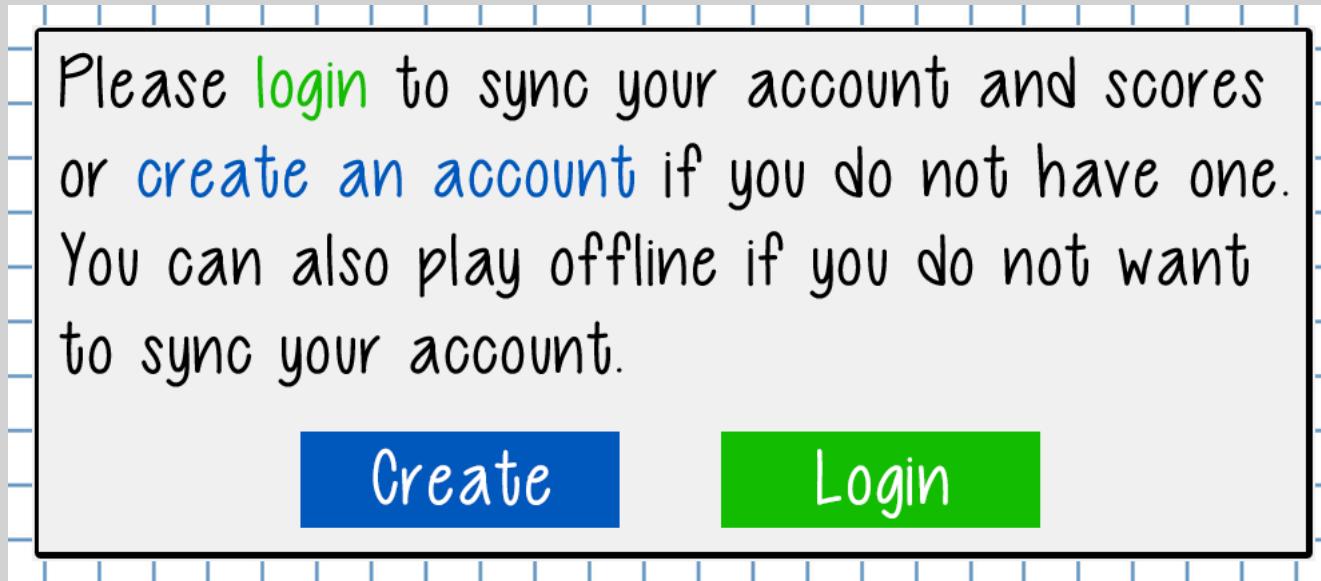
 Back

Please [login](#) to sync your account and scores
or [create an account](#) if you do not have one.
You can also play offline if you do not want
to sync your account.

[Create](#)[Login](#)

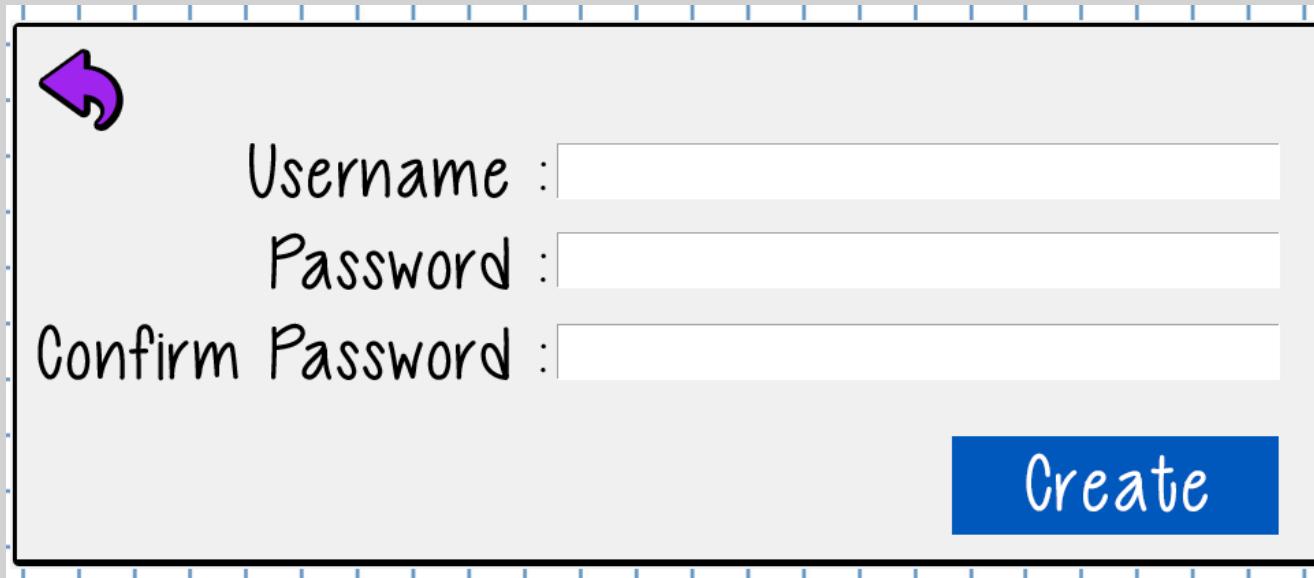
Sync Menu

Sync Menu



Player has 2 options, create an account or login. If user does not have an account yet, press the 'Create' button to go to create account menu (page 15). If user already have an existing account, press 'Login' button to go to login menu (page 18).

Sync Menu – Create Account

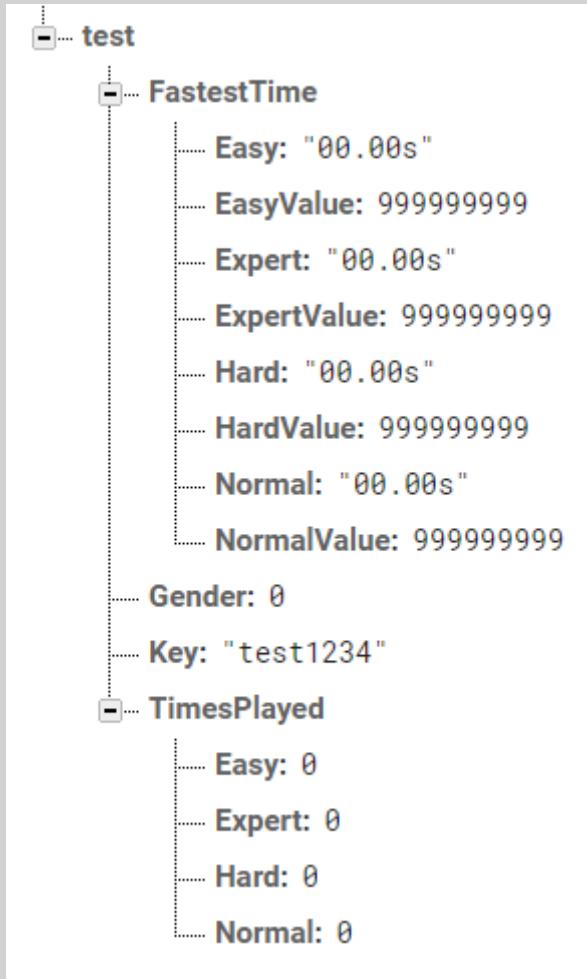


To create an account, player simply has to fill in their desired username and their password.

There are some errors that can occur:

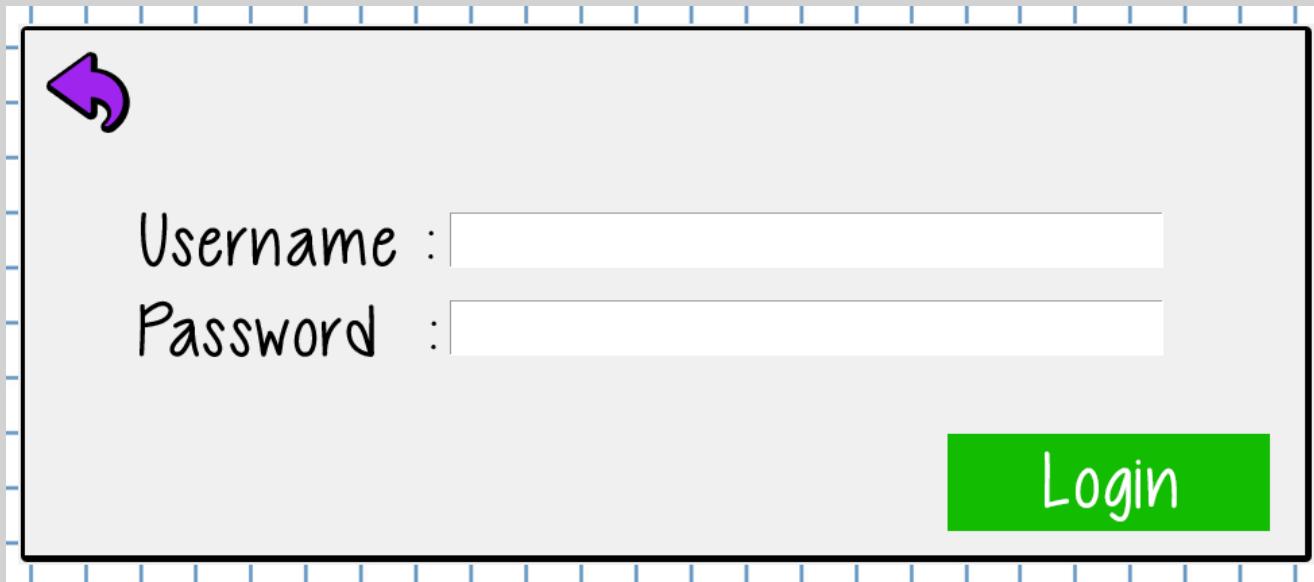
1. "Please complete all required fields." – when player did not fill in all fields.
2. "Passwords did not match. Try again." – when password and confirm password did not match.
3. "This username is already taken." – when there is an existing username in the Firebase database.

Sync Menu – Account created successfully



Once player has created their account, the game will create a Firebase database for the player. This allows player to access their account anywhere and anytime.

Sync Menu – Login

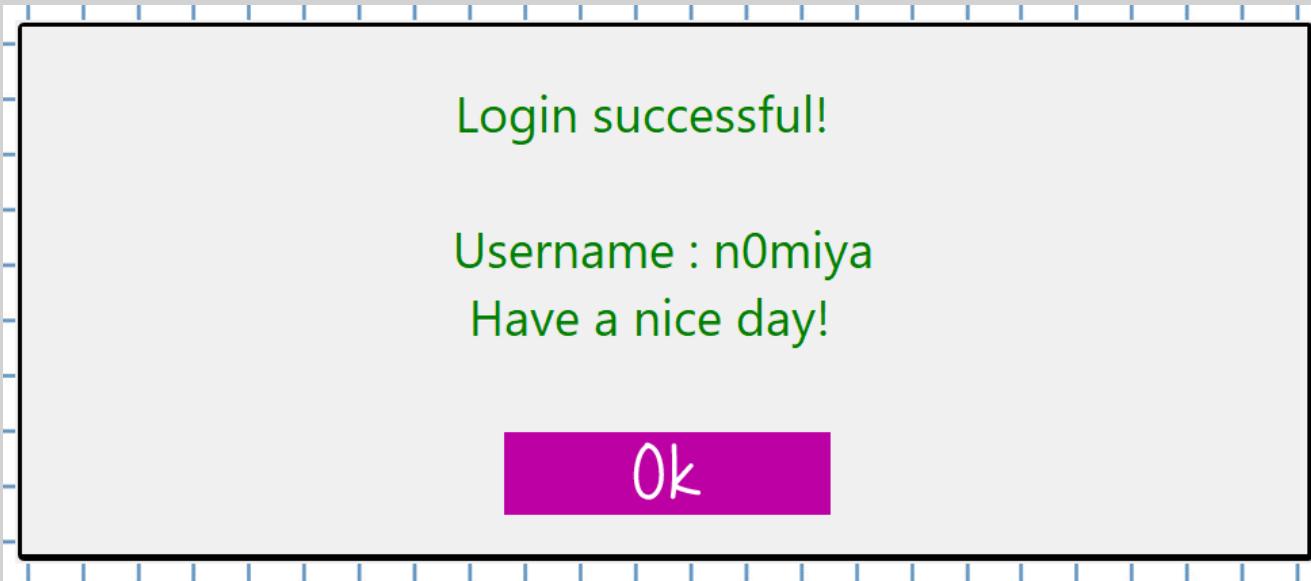


To login, player simply has to fill in their username and password used to create an account. After login successful, a dialog (page 18) will appear.

There are some errors that can occur:

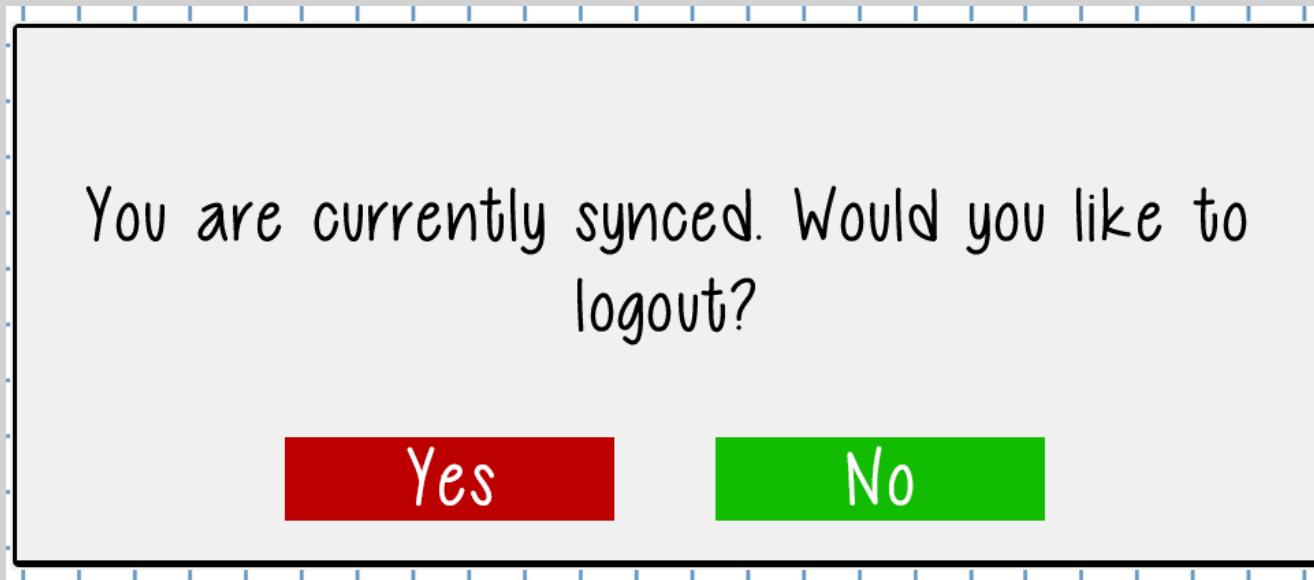
1. "Please complete all required fields." – when player did not fill in all fields.
2. "Username or password is incorrect. Try again." – when username or password did not match with the existing one in the Firebase database.

Sync Menu – Login Successful



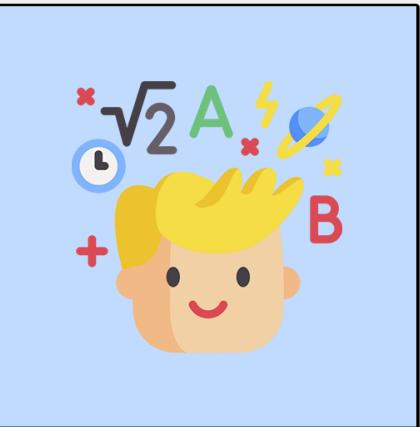
If user login successful, a dialog showing player's username will appeared. Player can now press 'Ok' button to go back to main menu (page 7)

Sync Menu – Logout



If there is an account already logged in, this dialog will appear, prompting player to logout or not. If player chooses to logout, player will be prompted with sync menu (page 13) again. Press 'No' button to go back to main menu.

 Back



n0miya

Times Played : 48

Easy : 20 (Fastest : 8.76s)

Normal : 15 (Fastest : 22.45s)

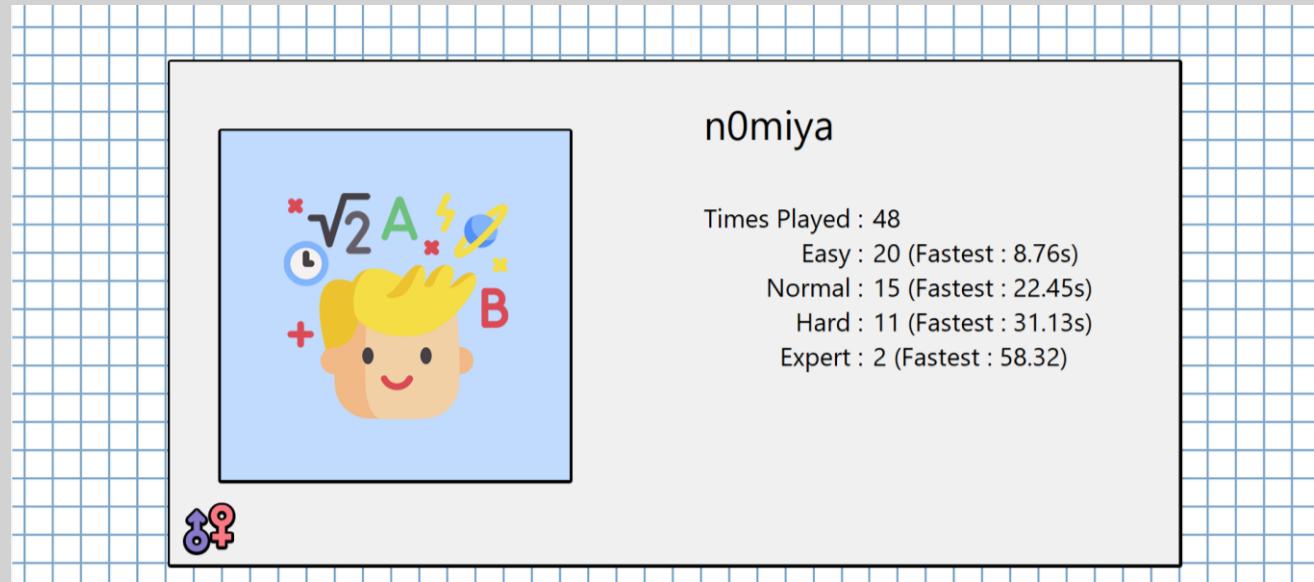
Hard : 11 (Fastest : 31.13s)

Expert : 2 (Fastest : 58.32)

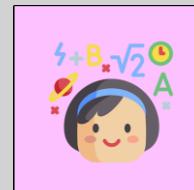


Profile

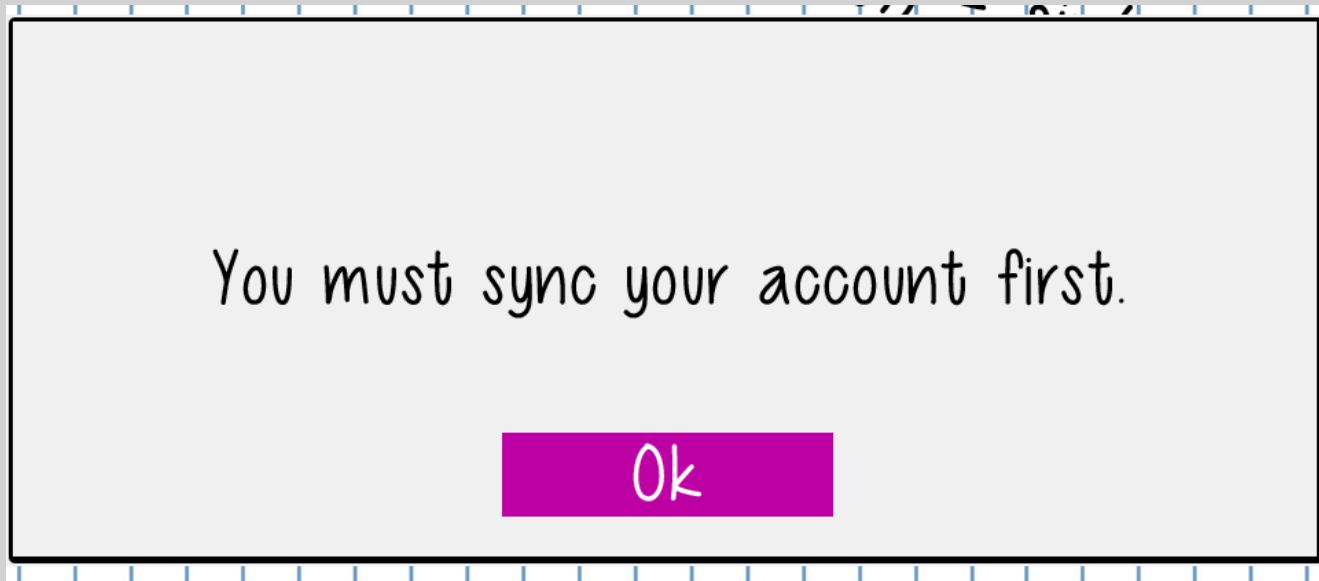
Profile



The profile page will tell player's username, times played, times played in each difficulty, and fastest time in each difficulty. Player also has an option to change their gender by pressing the gender icon in the bottom left corner.



Profile – Not synced



If player did not sync their account yet, player cannot access their profile.

 Back

Created with ❤ by n0miya

I am an upcoming year 1 student in software engineering (international program), KMITL. This is my first time learning Python as well as my first time creating a game in Python. I hope all of you enjoy this game and have a lot of fun XD.



github.com/n0miya



Judge Dulapah Vibulsanti



judge_dulapah



About

About

 Back

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github.com/n0miya



Judge Dulapah Vibulsanti



judge_dulapah

The about page will tell information about the developer, including name, message to players, and contact

AcΣMath

$$\log(xy) = \log(x) + \log(y)$$

$$128/\sqrt{e^{980}} = \sin(\pi)$$

 Play

 Sync

 Profile

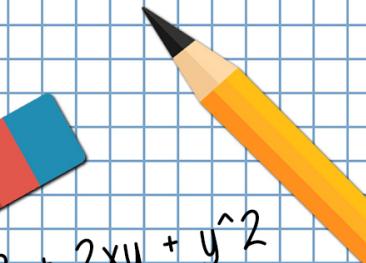
 About

 Exit

Are you sure you want to exit?

Yes

No



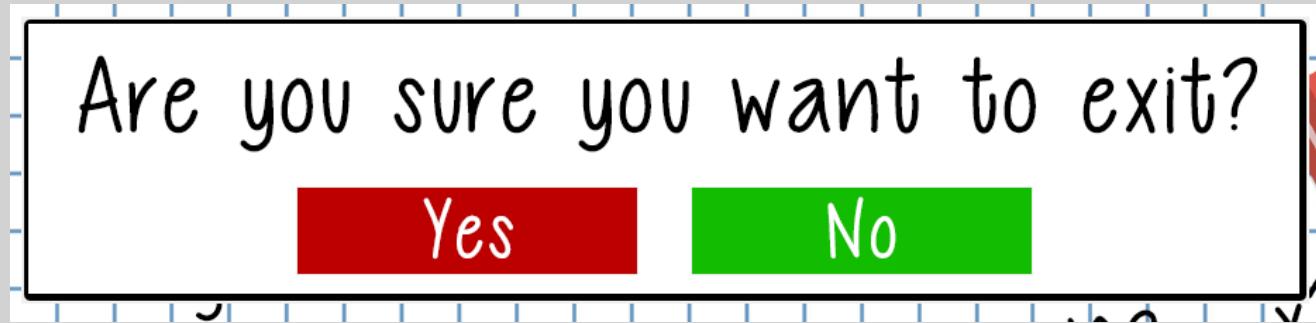
$$(x+y)^2 = x^2 + 2xy + y^2$$

$$a^2 + b^2 = c^2$$



Exit

Exit – Confirmation Dialog



After pressing the 'Exit' button, this dialog will appear. If player presses the 'No' button, the dialog will disappear. If player presses the 'Yes' button, the game will close.

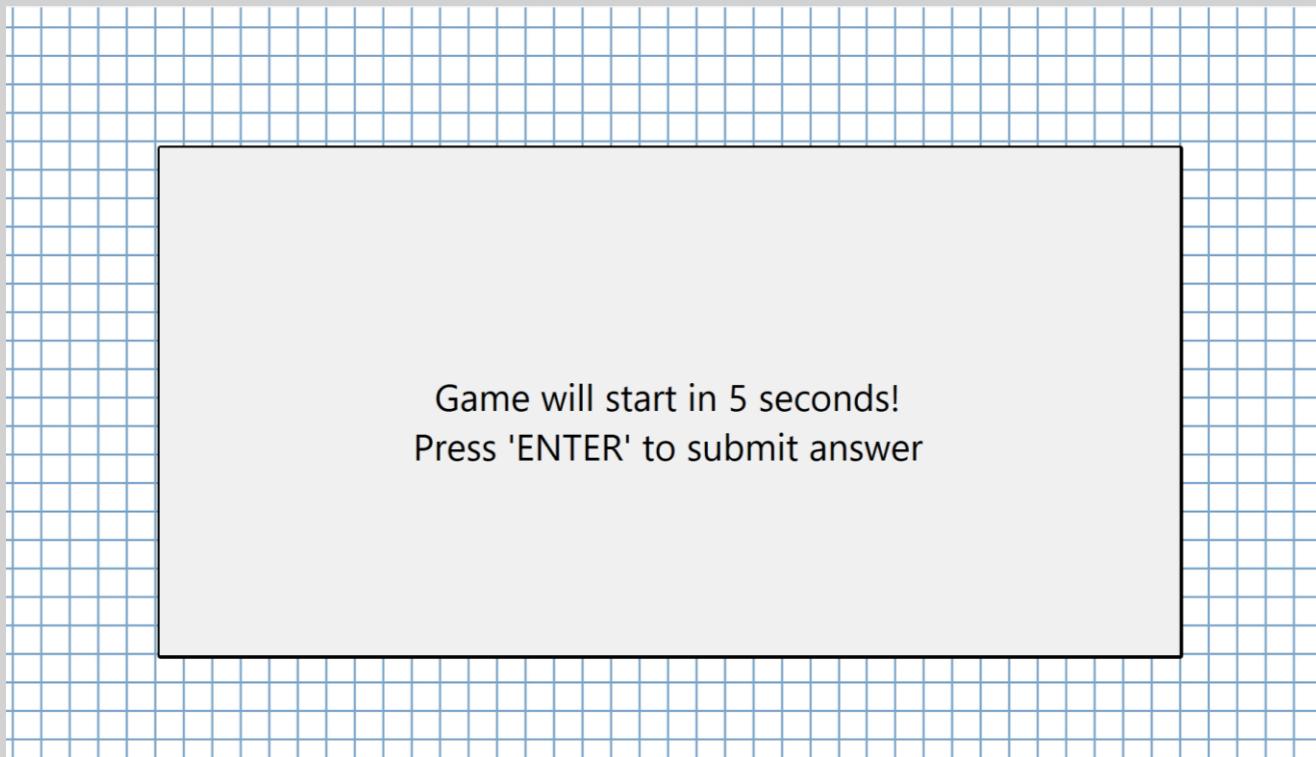


Game will start in 5 seconds!
Press 'ENTER' to submit answer



Countdown

Countdown



5 seconds countdown before the game starts. Get ready!

 Back

$$6764 + 6928$$

1/40



The Game

The Game

Back

1/40

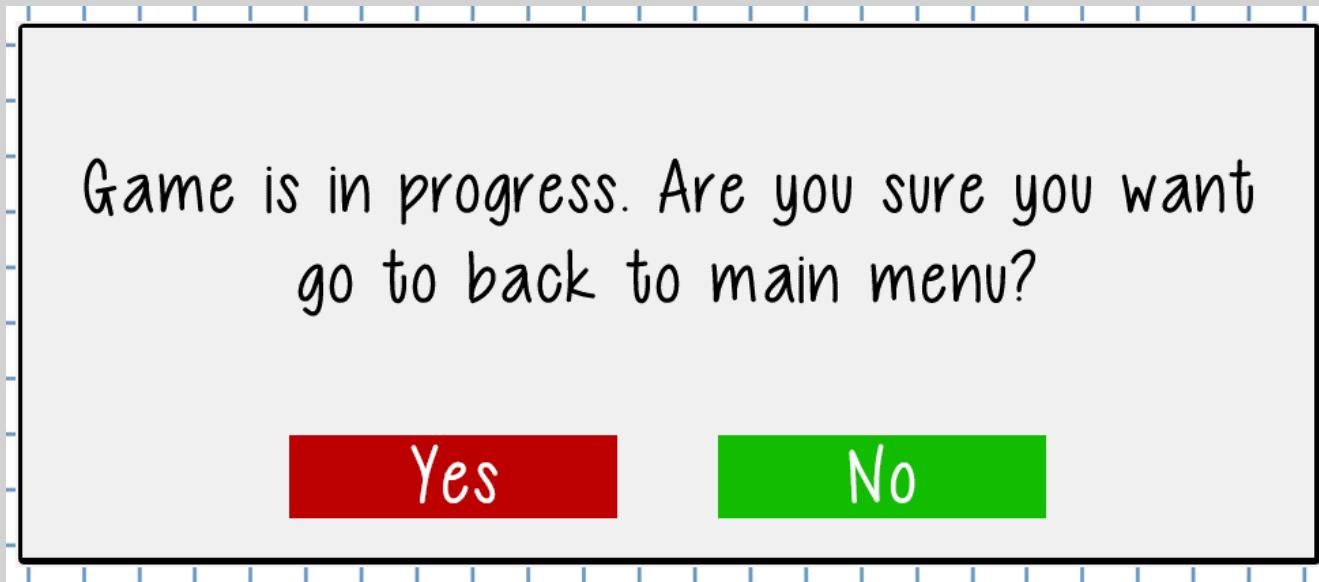
6764 + 6928

The 2 integers corresponding to player's difficulty will appear. Player must fill the field with the correct answer in order to proceed to next question. Be careful, time is counting!

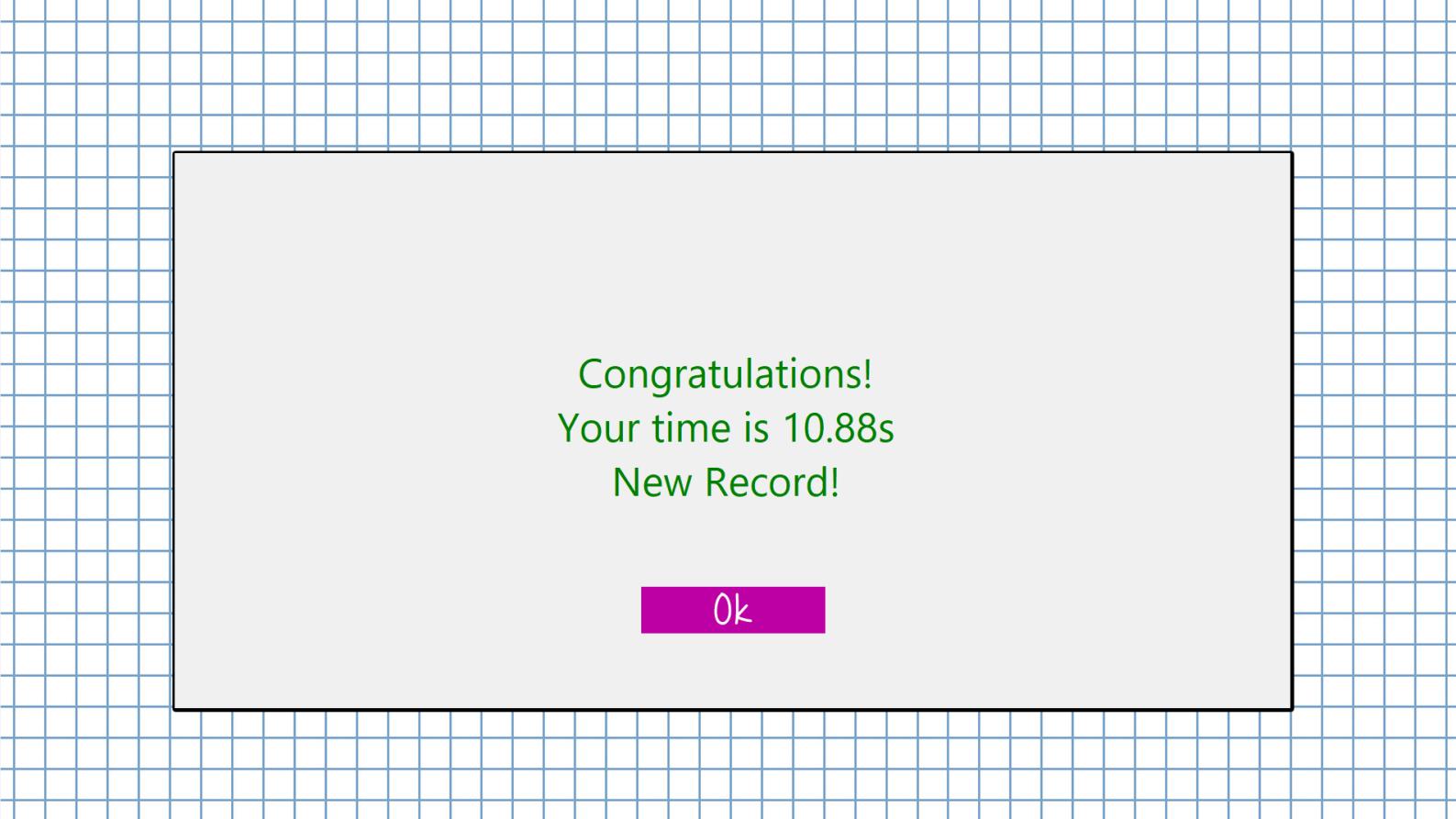
For the ease of player, the entry answer field is automatically selected to eliminate the use of mouse to click the field.

Player can also press 'Back' button to pause or go back to main menu, and a confirmation dialog (page 31) will appear.

The Game – Exit Confirmation



If player pressed 'Back' button while the game is in progress, this dialog will appear, and the stopwatch will pause. The question, and answer field will also disappear and disabled to prevent player from pausing the game to think for answer (cheating).



Congratulations!

Your time is 10.88s

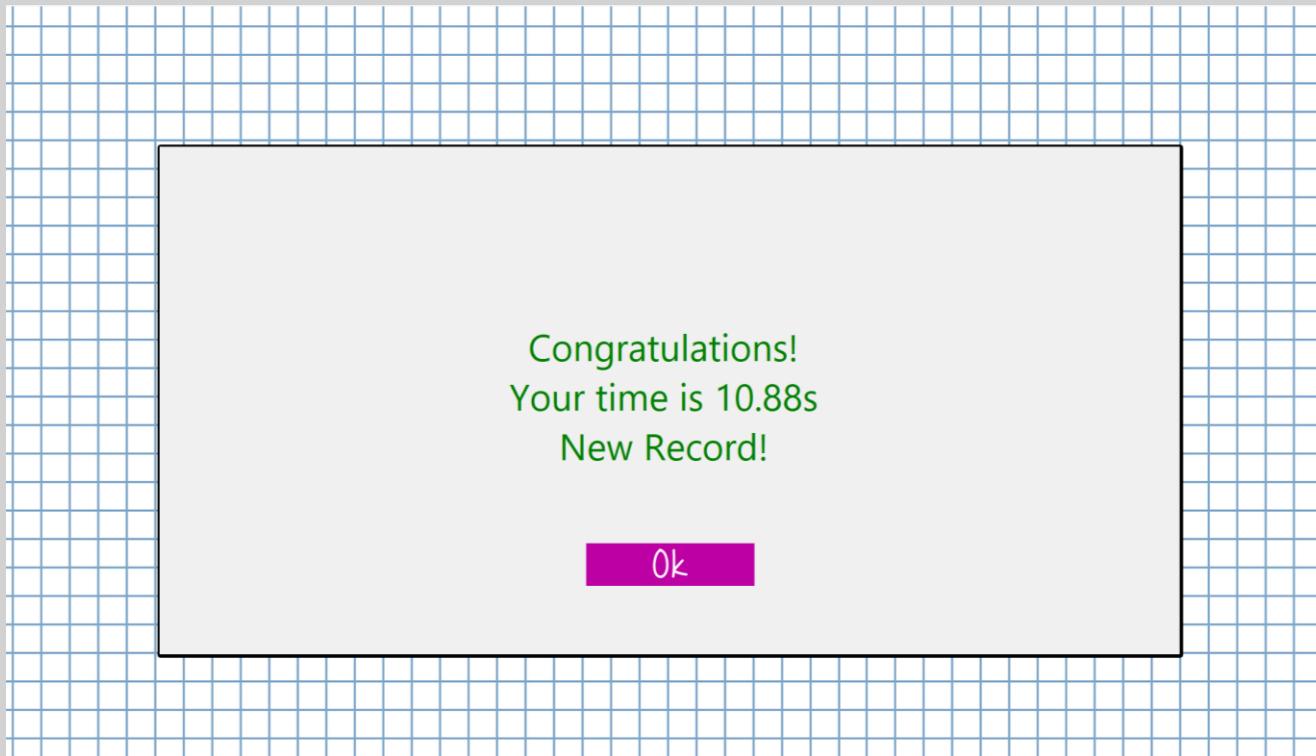
New Record!

Ok



Result

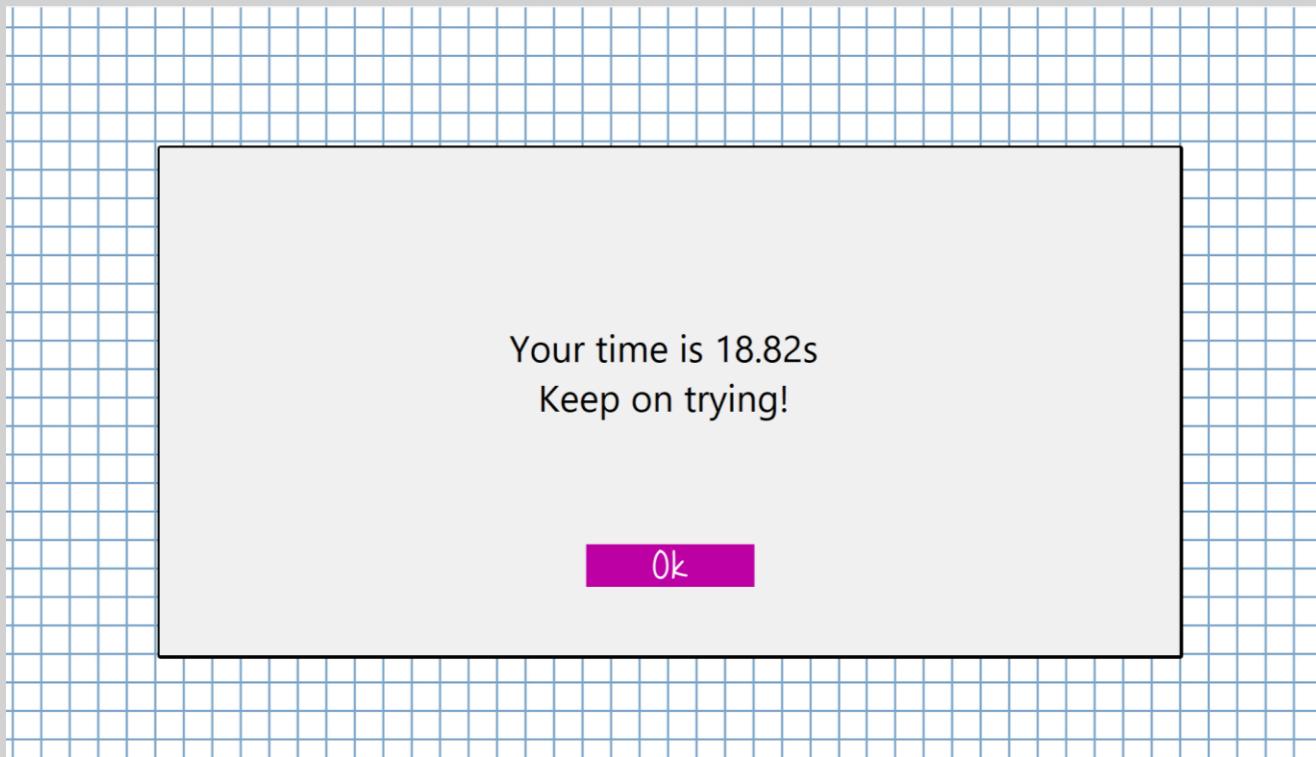
Result – New Record



Once player has correctly answered all questions, the result will appear. The result will show how much time the player took in order to finish the game, and if it is faster than player's current stat (in each difficulty), the text will become green and the text "Congratulations!...New Record!" will also appear.

Press the 'Ok' button to go back to main menu. Player can also go to profile page (page 20) to check their new time record.

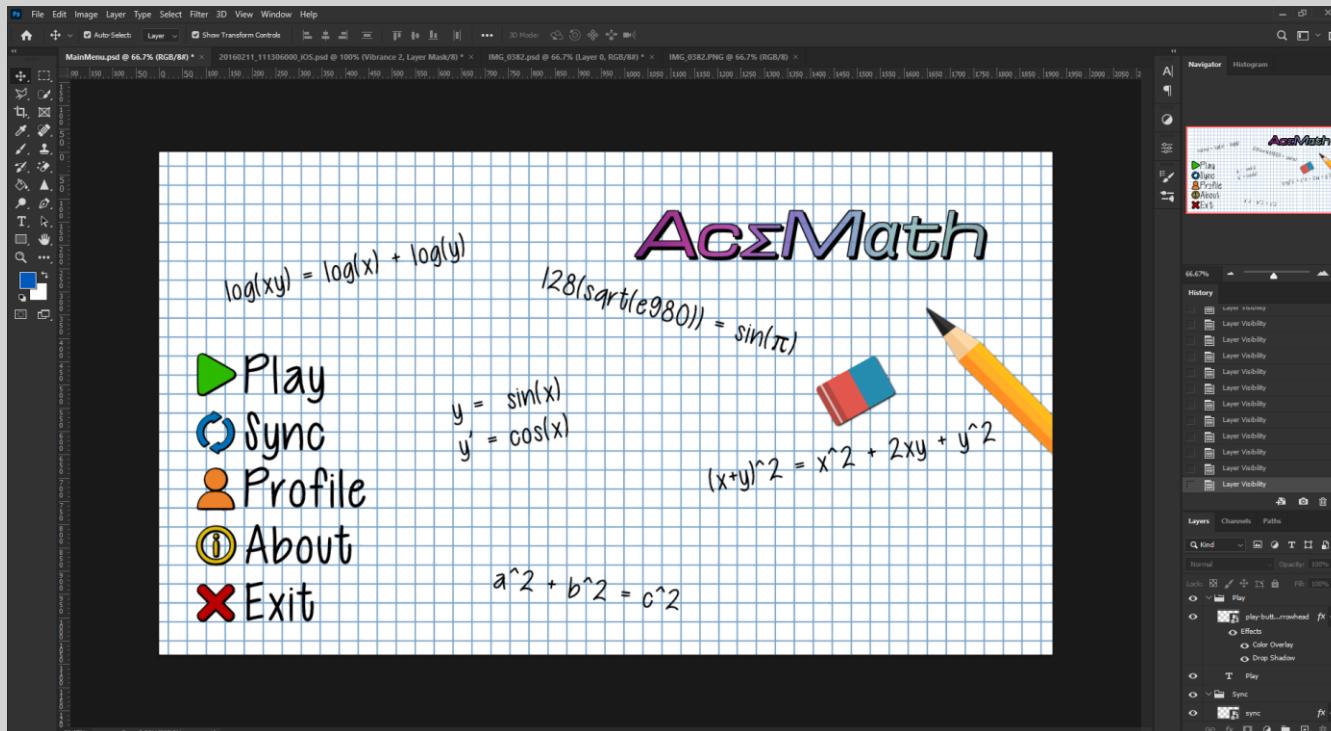
Result



If player did not make a new time record, a message motivating user will appear instead.

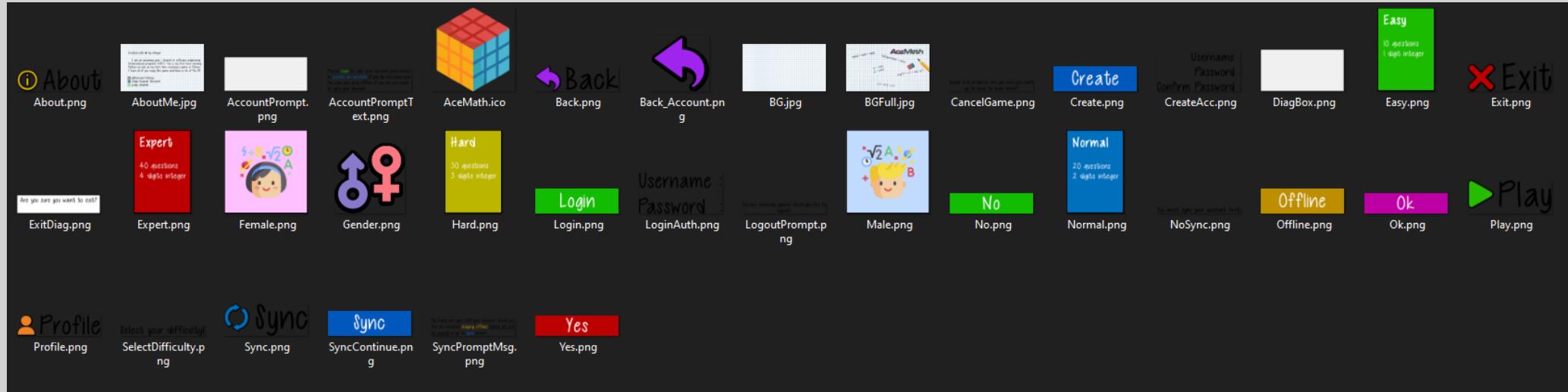
Behind the Scene

Behind the Scene – The Drawing Board



Firstly, I designed all UI and elements in Photoshop first to make sure that everything fits and looks good.

Behind the Scene – Exporting Assets



Then, I exported all assets before putting them into PyCharm.

Behind the Scene - Coding

Main.py

```
submit_score()

# Check if user input correct answer
def check_answer(event):
    if user_answer.get() == read_data(31):
        write_data(28, int(read_data(28)) + 1)
        user_answer.delete(0, "end")
        summon_integer()

# Submit score to Firebase if user already login
def submit_score():
    if read_data(1) == "1":
        times_played = db.reference('Users/' + read_data(4) + '/TimesPlayed/' + read_data(10))
        played = times_played.get()
        played += 1
        user = db.reference('Users')
        user.update({
            read_data(4) + '/TimesPlayed/' + read_data(10): played,
        })
        best_time_prev = db.reference('Users/' + read_data(4) + '/FastestTime/' + read_data(10) + 'Value')
        if stopwatch.duration < best_time_prev.get():
            pre_countdown.config(text="Congratulations!" + "\n" + "Your time is " + str(stopwatch) + "\nNew Record!",
                                  fg="green")
            user.update({
                read_data(4) + '/FastestTime/' + read_data(10): str(stopwatch),
                read_data(4) + '/FastestTime/' + read_data(10) + 'Value': stopwatch.duration
            })
    else:
        user_answer.delete(0, "end")
        user_answer.insert(0, "Please login first")

# Submit score to Firebase if user not login
def submit_score_not_login():
    if read_data(1) == "0":
        times_played = db.reference('Users/' + read_data(4) + '/TimesPlayed/' + read_data(10))
        played = times_played.get()
        played += 1
        user = db.reference('Users')
        user.update({
            read_data(4) + '/TimesPlayed/' + read_data(10): played,
        })
        best_time_prev = db.reference('Users/' + read_data(4) + '/FastestTime/' + read_data(10) + 'Value')
        if stopwatch.duration < best_time_prev.get():
            pre_countdown.config(text="Congratulations!" + "\n" + "Your time is " + str(stopwatch) + "\nNew Record!",
                                  fg="green")
            user.update({
                read_data(4) + '/FastestTime/' + read_data(10): str(stopwatch),
                read_data(4) + '/FastestTime/' + read_data(10) + 'Value': stopwatch.duration
            })
    else:
        user_answer.delete(0, "end")
        user_answer.insert(0, "Please login first")
```

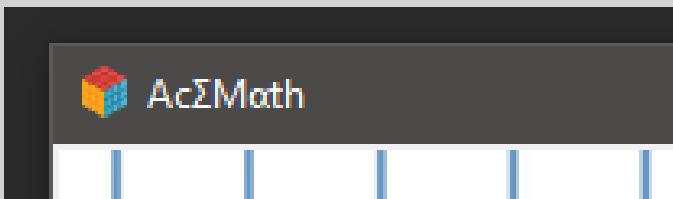
Over 880 lines of code have been written mostly by my understanding and current knowledge of Python.

798 lines of code for the main game mechanics and functions (Main.py).

90 lines of code for some game's functions
(Functions.py).

84 lines of text for storing game's variables
(data.txt).

Behind the Scene – Detailing and Debugging



Even the slightest details such as the icon logo and the title name has been considered along with many more unmentioned details.

```
Exception in Tkinter callback
Traceback (most recent call last):
  File "C:\Users\User\AppData\Local\Programs\Python\Python39\lib\tkinter\__init__.py", line 1884, in __call__
    return self.func(*args)
  File "L:\BornToDev\PythonProject\FinalProject\Main.py", line 359, in easy_gamemode
    start_game()
  File "L:\BornToDev\PythonProject\FinalProject\Main.py", line 415, in start_game
    countdown_timer(5)
  File "L:\BornToDev\PythonProject\FinalProject\Main.py", line 398, in countdown_timer
    stopwatch.restart()
```

Testing all possibilities of player's action and ensuring that game will not break.



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github.com/n0miya



Judge Dulapah Vibulsanti



judge_dulapah



This project would not be possible without...

- BornToDev team
- <https://stackoverflow.com/>
- <https://docs.python.org/>
- <https://www.w3schools.com/python/>
- <https://www.tutorialspoint.com/python/>
- <https://tkdocs.com/>
- <https://pypi.org/project/stopwatch.py/>
- <https://www.reddit.com/>
- <https://www.geeksforgeeks.org/>
- <https://www.flaticon.com/>
- https://www.youtube.com/watch?v=v2SAmDJ_SMg
- <https://www.youtube.com/watch?v=worclOeTALw>
- <https://www.youtube.com/watch?v=VNmtaa1Viek>
- <https://www.youtube.com/watch?v=dQw4w9WgXcQ>