Programming on Purpose (CSC 120)
Winter 2024

Project 1 – Igel Ärgern, Take One

Due: 1/25/2024

In this project, you will write a program to play a simplified version of “Igel Ärgern”.

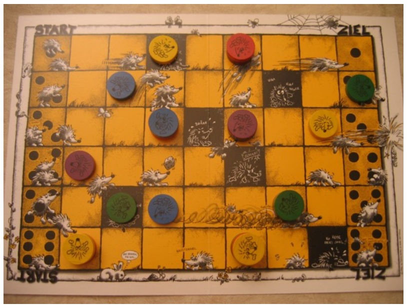
1 Objectives

- Re-acquaint yourself with Python
- Practice modularizing, using helper functions and modules
- Practice choosing good variable and function names
- Practice testing and debugging

2 Igel Ärgern

Igel Ärgern is a German boardgame. In English it is named “Hedgehogs in a Hurry”, but a more literal translation would be “To Annoy Hedgehogs” (*Igel* ⇒ *hedgehogs*, *ärgern* ⇒ *to annoy*).

You can find the rules here: `http://www.gamecabinet.com/rules/IgelArgern.html`. We will also play the game in class.



3 Your Mission

For this project, you will implement a version of Igel Ärgern that makes the following simplifying assumptions:

- There are no traps (black fields) on the board (for now).
- All human players are intelligent and cooperative: they only provide inputs that are valid and possible given the current state of the board. That means that (for now) you do not need to implement strategies for validating the user input.

4 Starter Code

- `igel_view.py`: This module implements a terminal based user interface. You should not modify this file. Use the first three function (`refresh_view`, `request_input`, `inform`) to interact with the players. **All** interaction with the user (i.e. printing to the screen, gathering input) should be done through the functions provided by the `igel_view` module.

  The file includes some examples of how to use the `refresh_view` function at the bottom. Run this file to execute this example code.

  Note that `if __name__=='__main__':` tests whether this file itself is being run or whether it is being imported. The body of this condition will only be run when `igel_view.py` itself is the main module being run. It won't be executed when `igel_view` is being imported into another program.

- `igel_aergern.py`: Starter code for the implementation of the game's main logic.

5 Requirements

1. All writing to the terminal or reading input from the terminal has to be done using the functions `refresh_view`, `request_input`, `inform` provided in the module `igel_view.py`.
2. The appendix shows some sample interactions with players. Your implementation should mimic those interactions as closely as possible. That is, at this point, don't ask the players for additional information, don't modify the order in which information is collected, don't print additional motivational or explanatory messages, refresh the view of the board as is shown in the examples. **Use the same wording and formatting as is shown in the example.**

6 Some Guidance

- **How do I start?** Start by thinking about how you could represent the Igel board in Python. Then implement the `create_board` and `update_interface` functions. At that point, you should be able to run the game and see the empty board represented in the terminal (cf. the first picture in the appendix).

  Hint: Notice that the `igel_view.refresh_view` functions takes a string representation of the board. However, that does *not* mean that you have to represent the board as a string in your implementation of the "Igel Ärgern" game logic. In fact, while it would be possible to represent the board as one big string, that choice would make many aspects of the implementation exceedingly tedious and error prone. Can you think of a way of representing the board that seems more convenient for the implementation of the game logic? Use that. And then add code to the `update_interface` function that converts/translates your representation to the string representation expected by `igel_view.refresh_view`.

- **When do I start?** Right now! Give yourself enough time to run into problems and get help fixing them and to revise your first draft of the program to make it better. Here is one suggestion for how you could break this project into smaller chunks:

  Week 1 (1/12–1/18):

  - implement creation of empty board
  - implement start-up phase

  Week 2 (1/19–1/25):

  - implement main phase
  - revise

- **Do I need to add additional function?** Yes! Each function should serve one main purpose that you can clearly state in the documentation for that function (without creating a run-on sentence). If you find that one function definition is getting so long that it's hard to read and that you need empty lines to create "paragraphs" of code, think about creating helper functions for (some of) the subtasks.
- **Do I need to add additional modules?** Glad you asked. That might be a good idea to make your code more modular. Good candidates are a module that contains functions related to creating and updating the board, a module that that models one Igel token (similar to the `domino` module from lab for modeling one domino token), and a module that models a player.

7 Getting Ready to Submit

Remember: *Just because it works doesn't mean it's good.*

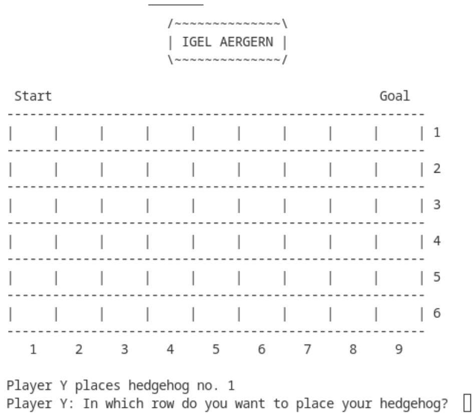
- Make sure that all modules and functions are documented and commented (cf. Project 0).
- Re-read your code and check for ways in which readability could be improved (e.g., good variable/function names, no magic numbers, consistent formatting, code is organized into logical units, each function serves one main purpose). Have a look at the official Python Style Guide: `https://peps.python.org/pep-0008/`.
- Don't forget to cite who you received help from and include the honor code affirmation at the top of each Python file you have written or edited:

```
I affirm that I have carried out my academic endeavors
with full academic honesty. [Your Name]
```

8 How to submit

Submit the project by uploading all Python files necessary to run your implementation to Gradescope (including the starter files).

A The startup phase



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                     | IGEL AERGERN |
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 Start                                           Goal
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|     |     |     |     |     |     |     |     |     | 1
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|     |     |     |     |     |     |     |     |     | 2
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|     |     |     |     |     |     |     |     |     | 3
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|     |     |     |     |     |     |     |     |     | 4
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|     |     |     |     |     |     |     |     |     | 5
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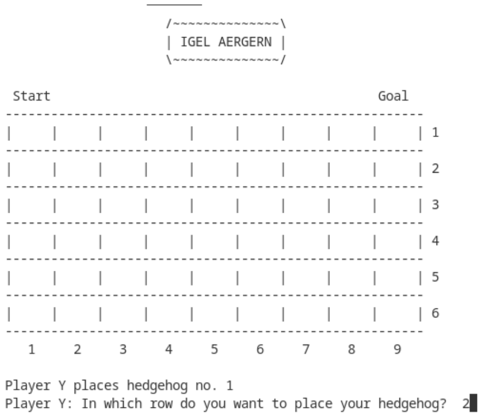
|     |     |     |     |     |     |     |     |     | 6
-------------------------------------------------------
   1     2     3     4     5     6     7     8     9

Player Y places hedgehog no. 1
Player Y: In which row do you want to place your hedgehog?  
```



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                     | IGEL AERGERN |
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 Start                                           Goal
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|     |     |     |     |     |     |     |     |     | 3
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|     |     |     |     |     |     |     |     |     | 4
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|     |     |     |     |     |     |     |     |     | 5
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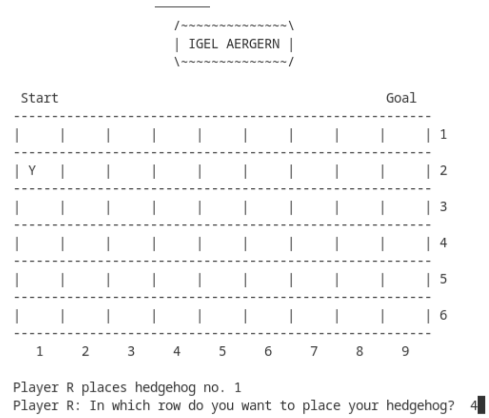
|     |     |     |     |     |     |     |     |     | 6
-------------------------------------------------------
   1     2     3     4     5     6     7     8     9

Player Y places hedgehog no. 1
Player Y: In which row do you want to place your hedgehog?  2
```



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                     | IGEL AERGERN |
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 Start                                           Goal
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|     |     |     |     |     |     |     |     |     | 1
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| Y   |     |     |     |     |     |     |     |     | 2
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|     |     |     |     |     |     |     |     |     | 3
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|     |     |     |     |     |     |     |     |     | 4
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|     |     |     |     |     |     |     |     |     | 5
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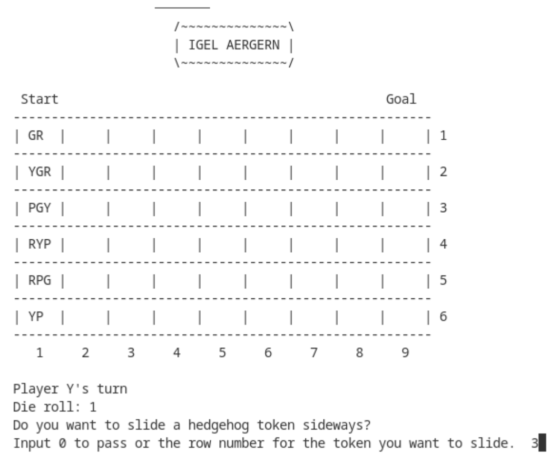
|     |     |     |     |     |     |     |     |     | 6
-------------------------------------------------------
   1     2     3     4     5     6     7     8     9

Player R places hedgehog no. 1
Player R: In which row do you want to place your hedgehog?  4
```

B The main phase



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                     | IGEL AERGERN |
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 Start                                           Goal
-------------------------------------------------------
| GR  |     |     |     |     |     |     |     |     | 1
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| YGR |     |     |     |     |     |     |     |     | 2
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| PGY |     |     |     |     |     |     |     |     | 3
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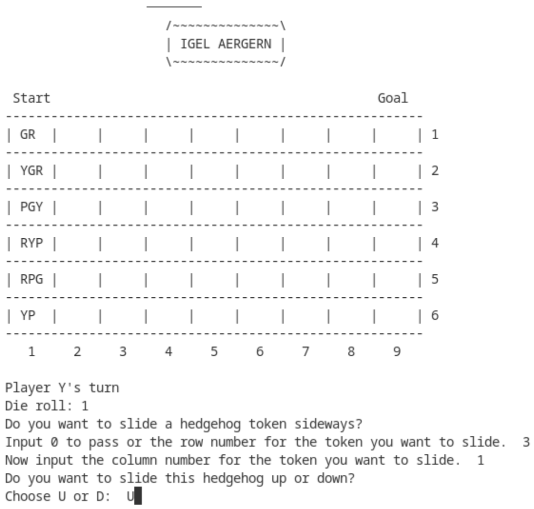
| RYP |     |     |     |     |     |     |     |     | 4
-------------------------------------------------------
| RPG |     |     |     |     |     |     |     |     | 5
-------------------------------------------------------
| YP  |     |     |     |     |     |     |     |     | 6
-------------------------------------------------------
   1     2     3     4     5     6     7     8     9

Player Y's turn
Die roll: 1
Do you want to slide a hedgehog token sideways?
Input 0 to pass or the row number for the token you want to slide.  3
```



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                   _______
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                     | IGEL AERGERN |
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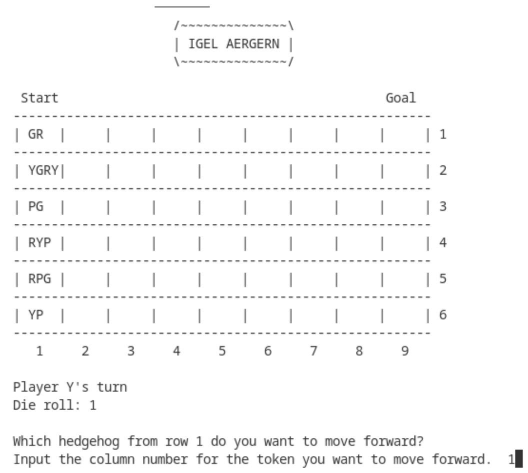
 Start                                           Goal
-------------------------------------------------------
| GR  |     |     |     |     |     |     |     |     | 1
-------------------------------------------------------
| YGR |     |     |     |     |     |     |     |     | 2
-------------------------------------------------------
| PGY |     |     |     |     |     |     |     |     | 3
-------------------------------------------------------
| RYP |     |     |     |     |     |     |     |     | 4
-------------------------------------------------------
| RPG |     |     |     |     |     |     |     |     | 5
-------------------------------------------------------
| YP  |     |     |     |     |     |     |     |     | 6
-------------------------------------------------------
   1     2     3     4     5     6     7     8     9

Player Y's turn
Die roll: 1
Do you want to slide a hedgehog token sideways?
Input 0 to pass or the row number for the token you want to slide.  3
Now input the column number for the token you want to slide.  1
Do you want to slide this hedgehog up or down?
Choose U or D:  U
```



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                   _______
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                     | IGEL AERGERN |
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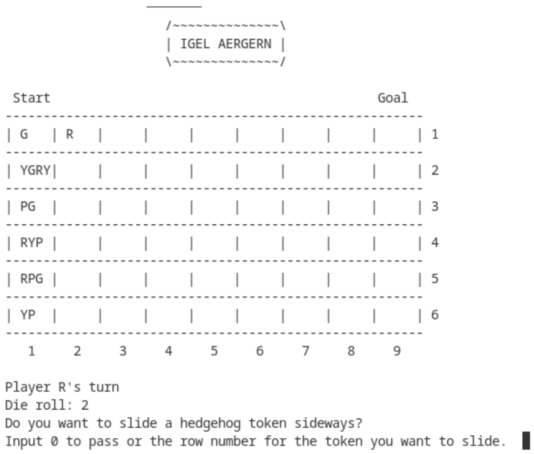
 Start                                           Goal
-------------------------------------------------------
| GR  |     |     |     |     |     |     |     |     | 1
-------------------------------------------------------
| YGRY|     |     |     |     |     |     |     |     | 2
-------------------------------------------------------
| PG  |     |     |     |     |     |     |     |     | 3
-------------------------------------------------------
| RYP |     |     |     |     |     |     |     |     | 4
-------------------------------------------------------
| RPG |     |     |     |     |     |     |     |     | 5
-------------------------------------------------------
| YP  |     |     |     |     |     |     |     |     | 6
-------------------------------------------------------
   1     2     3     4     5     6     7     8     9

Player Y's turn
Die roll: 1

Which hedgehog from row 1 do you want to move forward?
Input the column number for the token you want to move forward.  1
```



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                     | IGEL AERGERN |
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 Start                                           Goal
-------------------------------------------------------
| G   | R   |     |     |     |     |     |     |     | 1
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| YGRY|     |     |     |     |     |     |     |     | 2
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| PG  |     |     |     |     |     |     |     |     | 3
-------------------------------------------------------
| RYP |     |     |     |     |     |     |     |     | 4
-------------------------------------------------------
| RPG |     |     |     |     |     |     |     |     | 5
-------------------------------------------------------
| YP  |     |     |     |     |     |     |     |     | 6
-------------------------------------------------------
   1     2     3     4     5     6     7     8     9

Player R's turn
Die roll: 2
Do you want to slide a hedgehog token sideways?
Input 0 to pass or the row number for the token you want to slide.
```