Alexandria University
Faculty of Engineering
Computer and Communication Engineering
Specialized Scientific Programs

CC272
Programming II
Fall 2023 / 2024
Due 9/12/2023

Lab 9: Chess game

Part 3:

In this part of the lab, you will extend your chess game by adding **the undo feature** which is a complex functionality designed to reverse the last move made, returning the game to its previous state. **To implement this feature**, the game must track the state of the board, player status, special move conditions, and turn order at every move. This information is stored in a history log, typically using a stack data structure. When the undo function is called, the game retrieves the most recent state from the stack and reverts to it. Special moves like castling, **en passant, and pawn promotion** require additional handling to ensure the game state is restored accurately. A user-friendly interface element, such as a button or command, should be provided to trigger the undo operation.

Additionally, your assignment involves refining your project's design through the application of **appropriate design patterns**. The following design patterns are recommended, each of them can be used for some functionality. Try to figure out where to use the appropriate design pattern for which functionality. For example, you can use the memento design pattern for the undo functionality.

- **Factory design pattern**
- **Observer design pattern**
- **Command design pattern**
- **Memento design pattern**
- **Builder design pattern**

Dr. Layla Abou-Hadeed

Eng. Ahmed El-Sayed
Eng. Tarek Salah
Eng. Ahmed Ashraf
Eng. Youssef Victor
Eng. Mazen Sallam
Eng. Mostafa Ibrahim
Eng. Hania Yasser
Eng. Omar Hossam

It is important to note that these are not the only design patterns applicable to this project. You are encouraged to explore and potentially utilize other design patterns that may be relevant and beneficial. When choosing a specific design pattern, it is crucial to **provide a clear and well-reasoned justification** for your selection. This includes explaining why a certain pattern is suitable for your project needs and, conversely, why other patterns may not be as effective or applicable. The goal is to demonstrate a thoughtful and informed approach in your design choices, ensuring that the selected patterns contribute positively to the functionality and structure of your chess game.

Finally, you are required to show us your design through a **class diagram** for each design pattern you have applied.

What to be delivered:

- On the Google form, you should deliver a zipped file that contains the .java files along with a pdf of the class diagrams.
- Your zip file should be named as id1_id2_groupNumber1_groupNumber2. For example, 4678_4679_G1_G2.

Policies:

- You should work in teams of two.
- Delivery date is next saturday at 10 am
- Delivering a copy will be severely penalized for both parties, so delivering nothing is so much better than delivering a copy.
- No late submission is allowed

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