Cairo University

Faculty of Computers and Information

CS112

Programming - I

Assignment 1

2018

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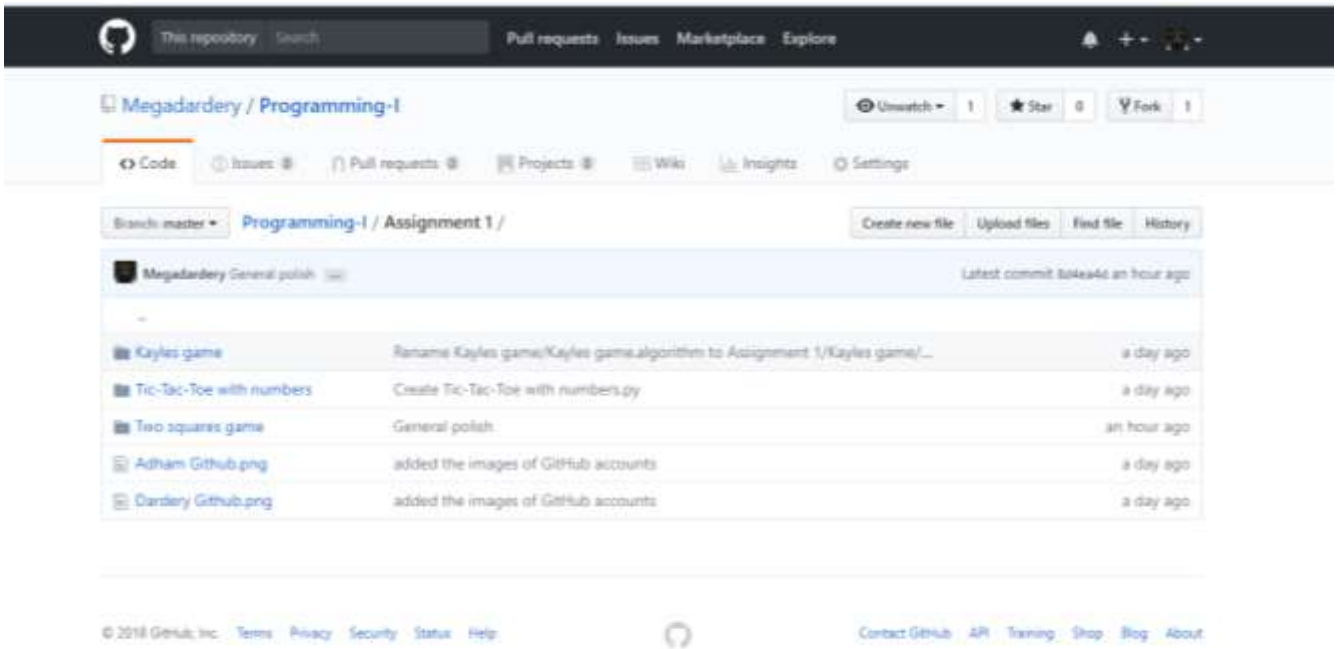
List of games made:

- Two squares game
  - With AI.
  - With Graphics
- Kayles game
  - With AI.
  - With Graphics
- 100 game
  - With AI.
- Tic-Tac-Toe with numbers (extra)

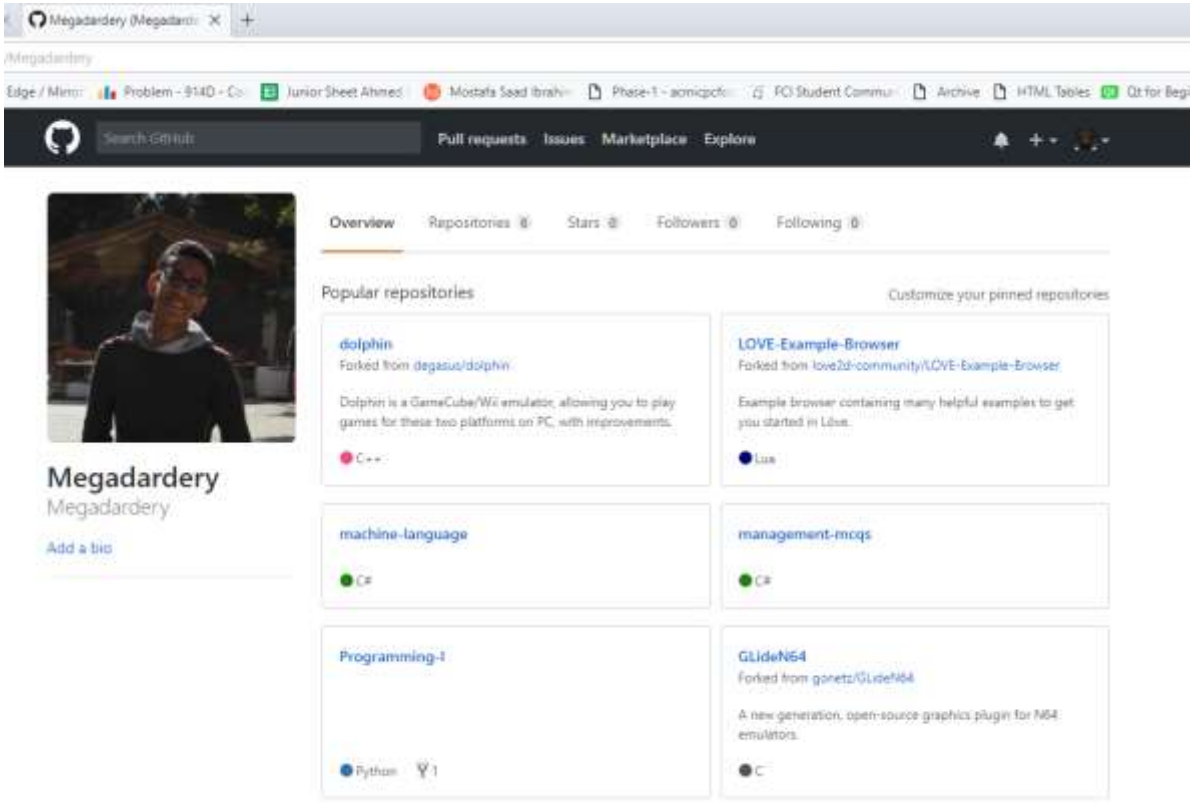
Github Repository:

https://github.com/Megaardery/Programming-I/tree/master/Assignment%201

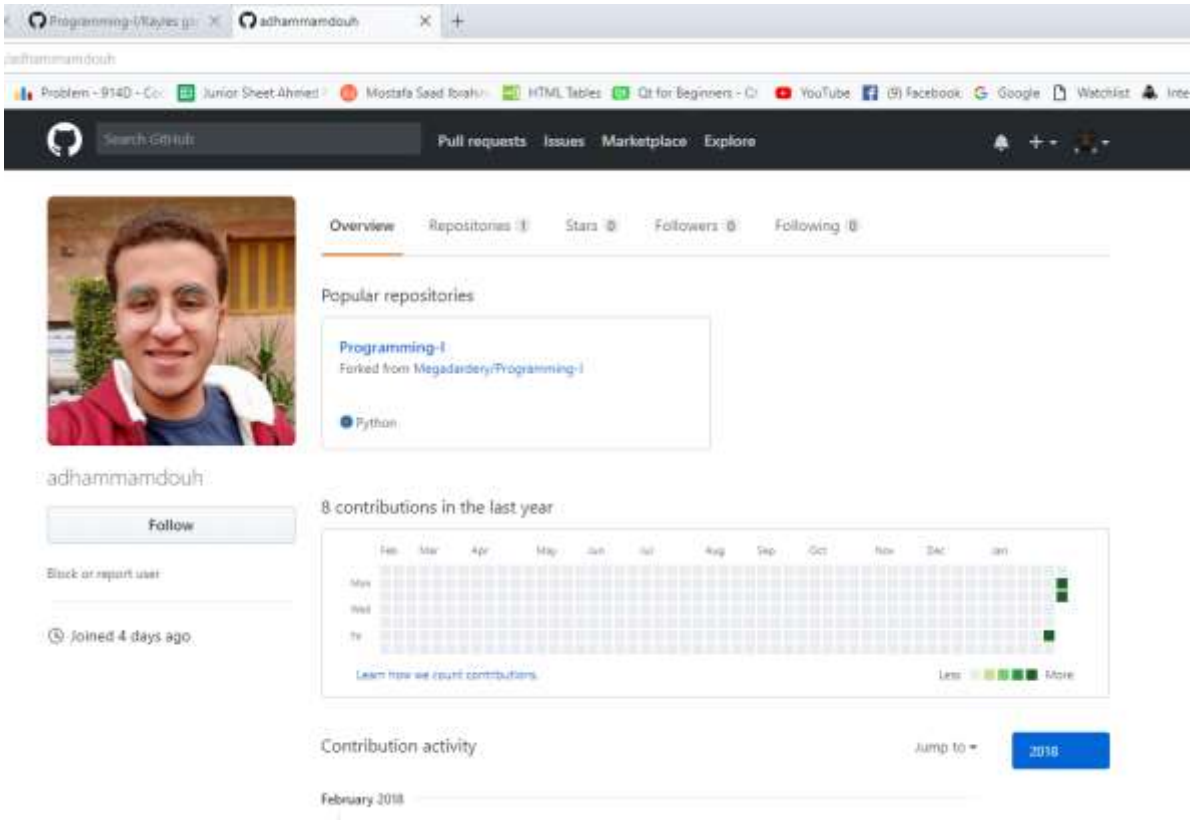


Github Accounts:

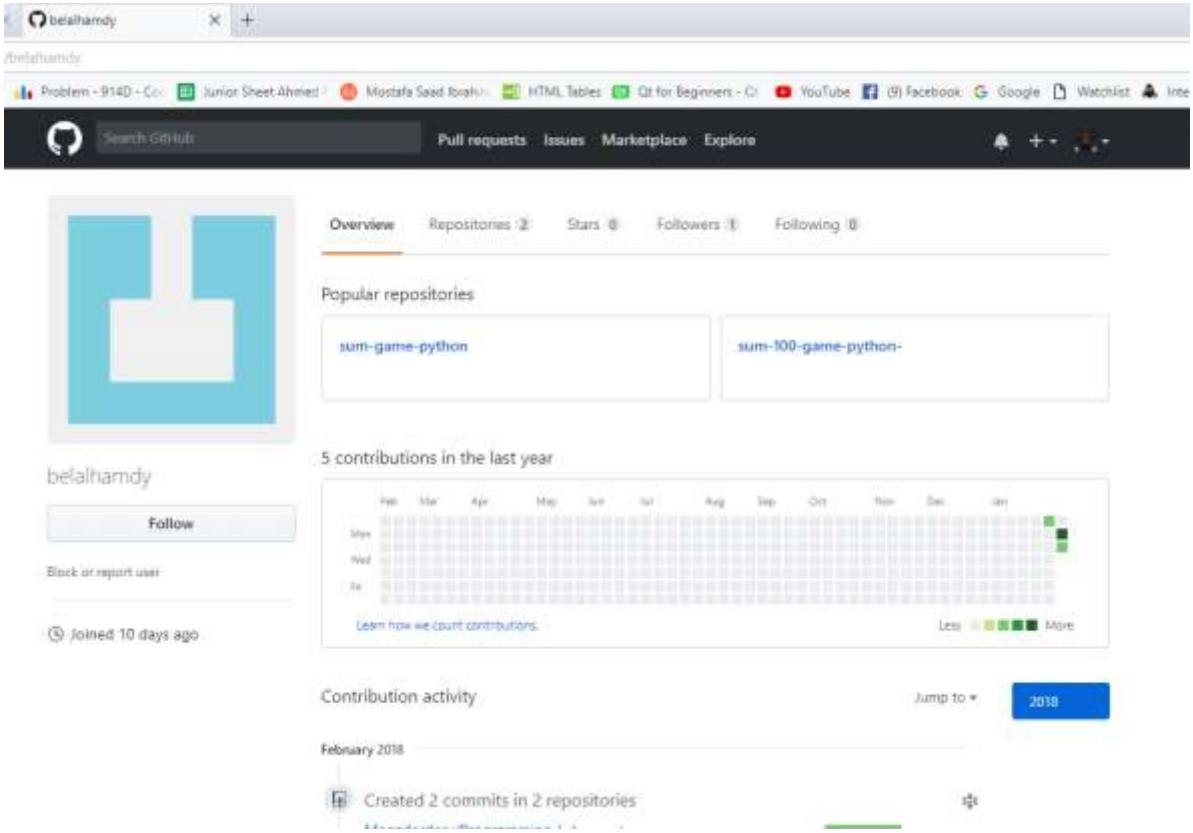
Ahmed Nasr Eldardery Ibrahim (megadardery):



Adham Mamdouh Mohamed (adhammamdouh):



Belal Hamdy Ezzat (belalhamdy):



Algorithms:

100 Game:

1. the user chooses the number of players (1-2).
2. if the number of players == 2 .
2.1. The first player enters number from 1 to 10 and from 1 to (100-sum) (errors are handled).
2.2. Then we add to the sum the number of the first user .
2.3. Then checking if the sum reaches 100.
2.4. Repeat these steps with player 2 until one from them wins.
3. if the number of players == 1 .
3.1. The player enters number from 1 to 10 and from 1 to (100-sum) in the same time.
3.2. Then add this number to the sum.
3.3. In strategy – based pc it makes somehow calculations to play the probably number. This strategy has a bug to make the user win.

Two squares game:

```
//Main game algorithm:
1.      Take valid input from player 1:
2.      Mark his/her inputs as filled
3.      If no more moves are possible:
3.1.            player 1 won
3.2.            exit

4.      Take valid input from player 2:
5.      Mark his/her inputs as filled
6.      If no more moves are possible:
6.1.           player 2 won
6.2.           exit

7.      go to step #1


//Perfect AI. algorithm
//(Mirror player 1's input)

1.      Get player 1's move as x and y
2.      a = 16 - x + 1
3.      b = 16 - y + 1
4.      Set A.I's move as a and b

//Know if there are possible moves:

1.      FOR i FROM 1 TO 16    (inclusive)
1.1.           IF (the ith square is free) AND (the square to the right of the ith is
free OR the square under the ith is free)
1.1.1.              return ValidMoveExists

2.      return NoMoreMovesArePossible
```

Kayles game:

```
      1.    list =
['1','2','3','4','5','6','7','8','9','0','1','2','3','4','5','6','7','8','9','0']
      2.    spaces = 20
      3.    If player1's turn
      3.1.      Print Player's turn
      3.2.      Get Input from Player 1
      3.3.      If Input is one number:
      3.3.1.        Set x = input
      3.3.2.        Set y = x
      3.3.3.        Decrement spaces by 1
      3.4.      Else:
      3.4.1.        Set x,y to the two numbers from input
      3.4.2.        Decrement spaces by 1
      3.5.      If x,y are not possible moves: goto 3.2.
      3.6.      set turn to player2's

      4.    Else If player2's turn
      4.1.      Print "Player 2's turn"
      4.2.      Get Input from Player 2
      4.3.      If Input is one number:
      4.3.1.        Set x = input
      4.3.2.        Set y = x
      4.3.3.        Decrement spaces by 1
      4.4.      Else:
      4.4.1.        Set x,y to the two numbers from input
      4.4.2.        Decrement spaces by 1
      4.5.      If x,y are not possible moves: goto 4.2.
      4.6.      set turn to player1's

      5.    Update list according to x, y

      6.    If spaces == 0
      6.1.      If player1's turn: print "player 1 is the winner"
      6.2.      Else: print "player 2 is the winner"
      6.3.      Exit loop
      7.    Go to step 3
```