Cairo University

Faculty of Computers and Information

CS112

Programming - I

Assignment 2

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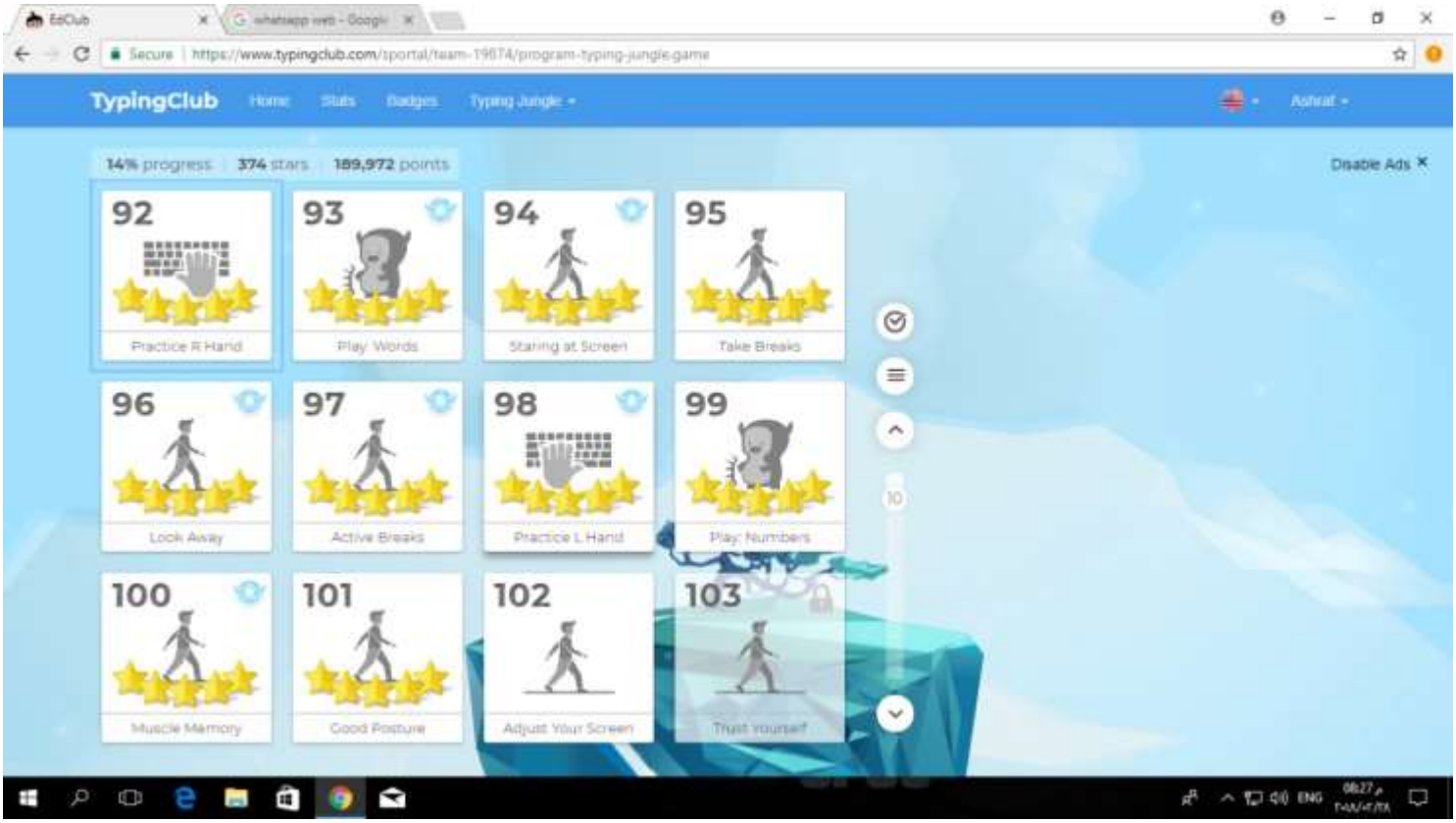
List of programs made:

- Cipher #3: ROT13 cipher
- Cipher #4: Baconian cipher
- Cipher #9: Railfence cipher
- All ciphers in a standalone program
- Book Problem #3, #7, #9
- Group Problem

TypingClub:




TypingClub
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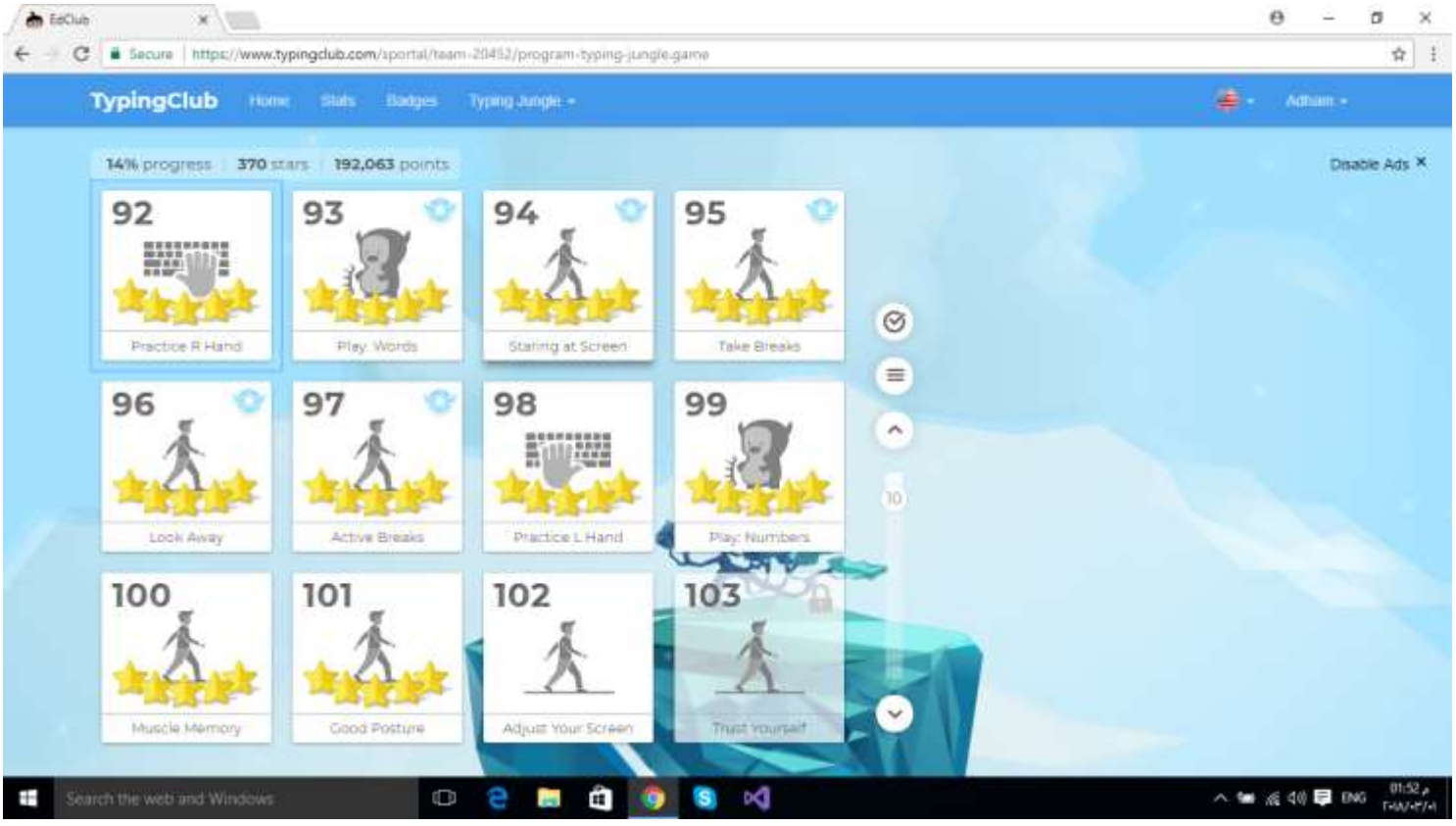
EdClub
Secure
https://www.typingclub.com/sportal/team-20452/program-typing-jungle.game
TypingClub
Home
Stats
Badges
Typing Jungle
Adham
14% progress
370 stars
192,063 points
Disable Ads
92 Practice R Hand
93 Play: Words
94 Staring at Screen
95 Take Breaks
96 Look Away
97 Active Breaks
98 Practice L Hand
99 Play: Numbers
100 Muscle Memory
101 Good Posture
102 Adjust Your Screen
103 Trust Yourself
Search the web and Windows
ENG

Algorithms:

Cipher #3 (ROT13 Cipher):

```
1.    Take input as letter from user
2.    Do the following for every character:
2.1.      if (ascii<78 and ascii>=65) or (ascii<110 and ascii>=97)
2.1.1         take this char and add 13
2.2.      else if (ascii>=78 and ascii<=90 ) or (ascii>=110 and ascii<=122)
2.2.1         take this char and subtract 13
2.3.      else
2.3.1         take this char and print it without changes
```

Cipher #4 (Baconian Cipher):

```
1.    Read Input
2.    Result = ""
3.    Do the following for each character (char):
3.1.      Convert all letters to upper case.
3.2.      if (char is not a letter)
3.2.1.        append char to Result
3.2.2.        skip to next letter
3.3.      encoding = ascii(letter) - ascii('A')
      \\Now all letters have a value starts from 0 for 'A' and ends at 25 for 'Z')
3.4.      Convert the integer <encoding> to the binary representation
      \\uses 'a' instead of '0' and 'b' instead of '1'
3.4.1.        put 'a' if last bit is 0 and 'b' if last bit is 1
3.4.2.        shift one bit to the right
3.4.3.        repeat 1.4.1. and 1.4.2. five times.
3.5.      Append the representation to Result.
4.    Print Result
```

Cipher #9 (Railfence Cipher):

```
0.0   take a number form the user (from 1 to 3)
0.1   if the number not from 1 to 3 (go to 0.0)
0.2   if the number = 1
0.3   print "Enter the message"
0.4   take the message from the user
0.5   print "Enter the key"
0.6   take the key from the user
0.7   make a 2D array = (the length of the message * key)
0.8   make a loop starts from 0 to key (i = 0)
0.8.0           make a loop starts from 0 to length of message (j = 0)
0.8.0.1     make array of (i , j) = ' '
0.8.0.2        j = j + 1
0.8.1        i = i + 1
0.8   i = 0
```

```
0.9   row = 0
1.0   col = 0
1.1   k = -1
1.2   make a loop starts from 0 to length of message
1.2.0           make array of (row , col) = message of (i)
1.2.1           if (row = 0 or row = key)
1.2.1.0             k = k * -1
1.2.2     row = row + k
1.2.3     i = i + 1
1.2.4     if i less than the length of the message go to 1.2.0
1.3   make a for loop starts from 0 to key (i = 0)
1.3.0     make a loop start from 0 to length of message (j = 0)
1.3.0.0         if(array of (i , j) not equal ' ')
1.3.0.0.0           print array (i , j)
1.3.0.1         j = j + 1
1.3.1       i = i + 1
1.4   else if the number = 2
1.4.0     print "Enter the message"
1.4.1           take the message from the user
1.4.2           print "enter the key"
1.4.3           take the key from the user
1.4.4     make a 2D array = (length of message * key)
1.4.5           make a loop starts from 0 to key (i = 0)
1.4.5.0           make a loop starts from 0 to length of message (j = 0)
1.4.5.0.0         make array of (i , j) = ' '
1.4.5.0.0          j = j + 1
1.4.5.1           i = i + 1
1.4.6           i = 0
1.4.7           row = 0
1.4.8           col = 0
1.4.9       k = -1
1.5.0     posit = 0
1.5.1           make a loop starts from 0 to length of message
1.5.1.0           make array of (row , col) = '*'
1.5.1.1           if (row = 0 or row = key)
1.5.1.1.0          k = k * -1
1.5.1.2           row = row + k
1.5.2     make a loop starts from 0 to key (i = 0)
1.5.2.0        make a loop starts from 0 to the length of the message (j = 0)
1.5.2.0.0         if(array of (i , j) = '*')
1.5.2.0.0.1           array of (i , j) = message of (posit)
1.5.3          make a loop starts from 0 to key (i = 0)
1.5.3.0        make a loop starts from 0 to length of the message
1.5.3.0.0          if ( array of (i , j) not equal ' ')
1.5.3.0.0.0             print (array of (i , j))
1.6       if number = 3
1.6.0           end the program
```

Book Problem 3:

1. Take start and end from user
2. while (start < end)
2.1. calculate this function: velocity=331.3+0.61*start
3. print velocity

Book Problem 4:

1. Get weight, height, gender, and age.
2. Calculate BMR:
66 + (6.3 * weight) + (12.9 * height) - (6.8 * age) for men
655 + (4.3 * weight) + (4.7 * height) - (4.7 * age) for women
3. Calculate the number of chocolate bars: BMR/230.0

Book Problem 9:

1. Get number from user.
2. x = 1.0 (initial guess)
3. for i from 0 to 10:
3.1. $a = \frac{n-x^2}{2 \cdot x}$
3.2. $b = x + \mathrm{a}$
3.3. $x = \mathrm{b} - \frac{a^2}{2 \cdot x}$
4. print

Team Problem (G2):

1. Get x from user
2. result = 0
3. For i from 0 to 100:
3.1. pow = x^i
3.2. fac = i!
3.3. result = result + (pow / fac)
4. print result.