CS112: Programming - 1
Assignment 3 –20th April

Cairo University, Faculty of Computers
and Artificial Intelligence

FACULTY OF COMPUTERS AND ARTIFICAL INTELLIGENCE, CAIRO UNIVERSITY

CS112: Structured Programming

Winter 2021 – 2022

Second Semester

Assignment 3

Part 1+part 2

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1) 20210535

Filter 2: Invert Image.

1- Create a void function .
2- Create a nested loop on the photo , iterator “i” on rows and iterator “j” on column .
3- We subtract 255 from the photo to change the color from i and j .

Filter 5: Rotate Image.

90 degree

1- Create a void function .
2- Create a nested loop on the photo , iterator “i” on rows and iterator “j” on column and iterator “k” equal to size of photo and k decreasing by 1.
3- We use the function (swap) to swap the rows to columns .

270 degree

1- Create a void function .
2- Create a nested loop on the photo , iterator “i” on rows and iterator “j” on column and iterator “k” equal to size of photo and k decreasing by 1.
3- We use the function (swap) to swap the columns to rows .

180 degree

1- Create a void function .
2- Create a for loop that looping twice and put the nested loop for function of 90 degree .

3- Create a nested loop on the photo , iterator “i” on rows and iterator “j” on column and iterator “k” equal to size of photo and k decreasing by 1.
4- We use the function (swap) to swap the rows to columns .

Filter 8: Enlarge Image.

1- create a void function .

2- create a if condition (if quart = 1) that include a for loop ..when the photo begin with (0,0) and we need the get the first quart that we divide a SIZE / 2 .

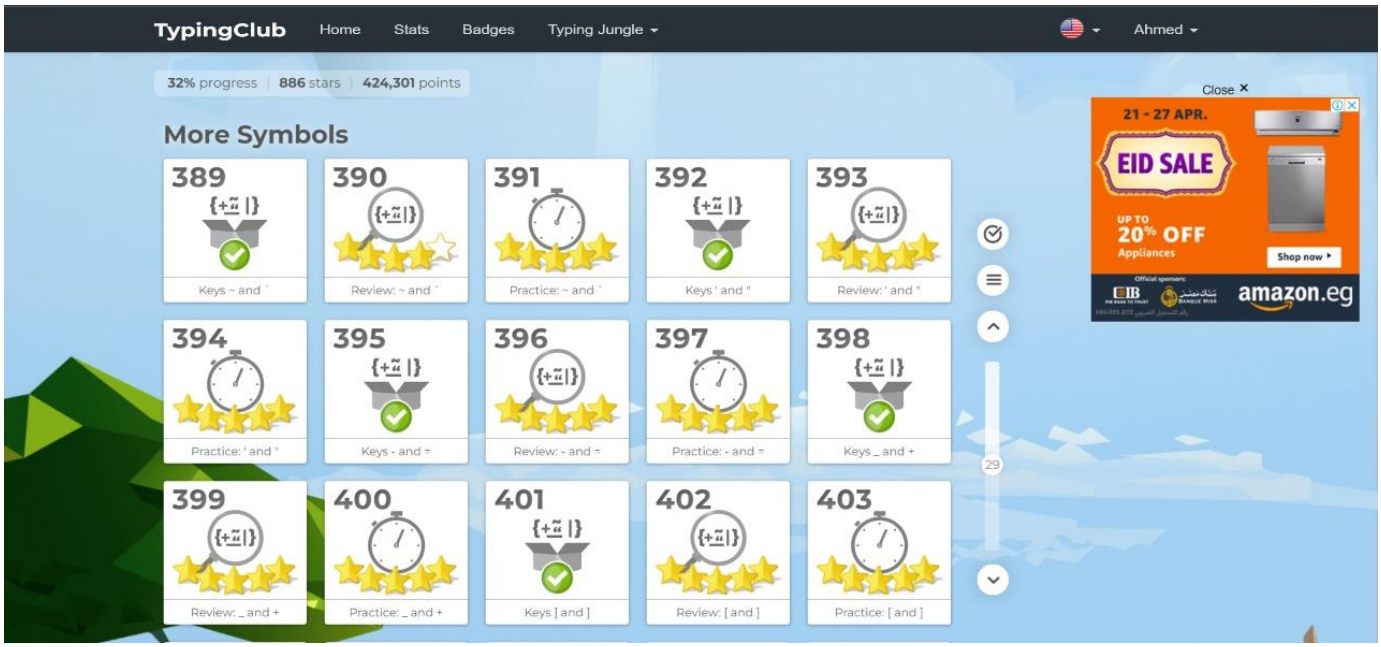
3- (if quart = 2) we need to extract the second quart and put, enlarge it in the new image….create a for loop that the photo begin with (0,128) .

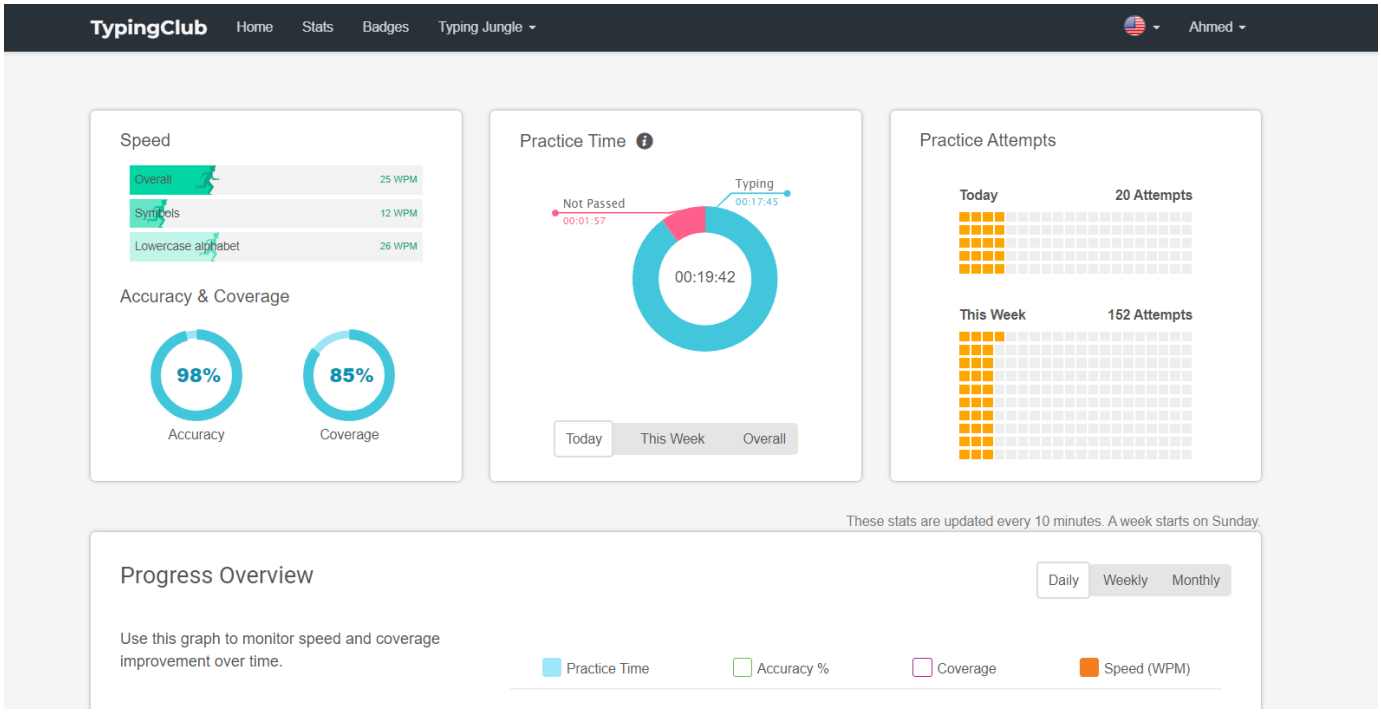
4- (if quart = 3) we need to extract the third quart and put, enlarge it in the new image…create a for loop that the photo begin with (128,0) .

5- (if quart = 4) we need to extract the forth quart and put, enlarge it in the new image…create a for loop that the photo begin with (128,128) .

Filter b: shuffle Image.

When the user choose the new order of quarters , say that (x , y , z , a)…. x has 4 conditions, if user insert first quart of second or third or forth and so on, on the other orders y, z and a .





2) 20210202

Filter 1: Black and White .

1. make a function void to filter grey image to black and white :

#we make a two for loop to loop on each element of colmn and row in the array of 2D

```
for (int x = 0; x < SIZE; x++) {
    for (int y = 0; y< SIZE; y++) {
```

#we chick her if this pixles is greater than 127 (that means its grey (a degree of colour between black and white)) and we make it white :

```
        if (image[x][y] > 127)
            image[x][y] = 255;
```

#else we make this pixles black .

```
     else
            image[x][y] = 0;
    }
  }
}
```

Filter 7: Detect Image.

1. we turn the grayscale image to black and white image

2. we for loop of each element in row and each element of collmn

```
for (int i = 0; i < SIZE; i++) {
    for (int j = 0; j < SIZE; j++) {
```

3. we check if the element of colmon is not equal to the next element of clomn with (the same row)

```
if (image[i][j] != image[i][j + 1] || image[i][j] != image[i][j - 1] || image[i][j] != image[i + 1][j]) {
```

4. make this pixel black .

```
image2[i][j] = 0;
```

5. if not we make it white

```
        } else {
            image2[i][j] = 255;
        }
    }
}
```

Filter 4: Flip Image .

we make void function to flip the image

#we make a two for loop to loop on each element of colmn and row in the array of 2D

```
  for (int x = 0 ; x <= SIZE /2 ; x++) {
    for (int y = 0; y != SIZE ; ++y ) {
#here we swap the first element of colmn with the last and for raw too
swap(image[x][y], image[SIZE - 1 - x][y]) ;
    }
    }
```

Filter a: Mirror Image.

```
int choice ;
   cout << " 1- mirror left " << endl << "2- mirror right" << endl << "3- mirror up" << endl << "4- mirror down" << endl ;
   cin >> choice ;

   if (choice == 1){
```

here we mirror left so we will swap between colmns

1. we for loop of each element in row and each element of collmn.

```
        for (int row = 0; row < SIZE ; row++)
   {
      for (int col = 0; col < SIZE/2 ; col++)
      {
```

2. we swap the first element(pixel) of colmn with the same(row) with the last one and so one .

```
   image[row][col] = image[row][255-col] ;

      }
   }
}
else if (choice == 2){
```

we here Mirror right so we will swap with colmns

```
    for (int row = 0; row < SIZE ; row++)
  {
    for (int col = 0; col < SIZE ; col++)
    {
```

3 . we swap the last element(pixel) of colmn with the same(row) with the first and so on .

```
        image[row][255-col] = image[row][col] ;
    }


    }
}
else if (choice == 3) {
```

we here mirror up so we swap between rows

```
    for (int row = 0; row < SIZE ; row++)
  {
    for (int col = 0; col < SIZE ; col++)
    {
```

4. we swap the last element(pixel) of row with the same(colmn) with the first and so on .

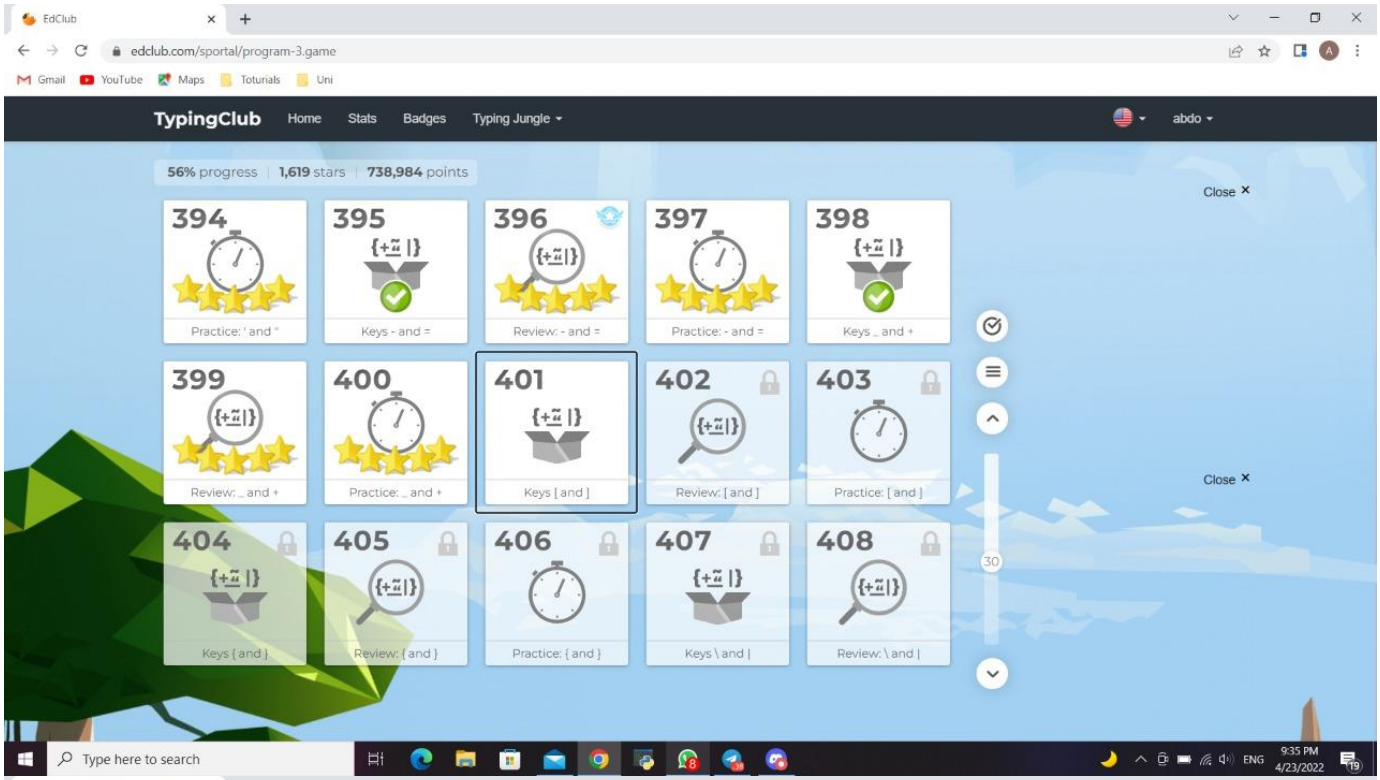
```
            image[255-col][row] = image [col][row] ;


    }
```

```
    }
}

else if (choice == 4 ){
# we here Mirror down so we swap between rows
        for (int row = 0; row < SIZE ; row++)
    {
        for (int col = 0; col < SIZE /2 ; col++)
        {
```
5. we here swap with the first element of row to the last element with the same (colmn)
```
            image[col][row] = image [255-col][row] ;


        }
    }
}
}
```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Gmail YouTube Maps Toturials Uni
TypingClub Home Stats Badges Typing Jungle abdo
56% progress | 1,619 stars | 738,984 points
Close
394 Practice: ' and "
395 Keys - and =
396 Review: - and =
397 Practice: - and =
398 Keys _ and +
399 Review: _ and +
400 Practice: _ and +
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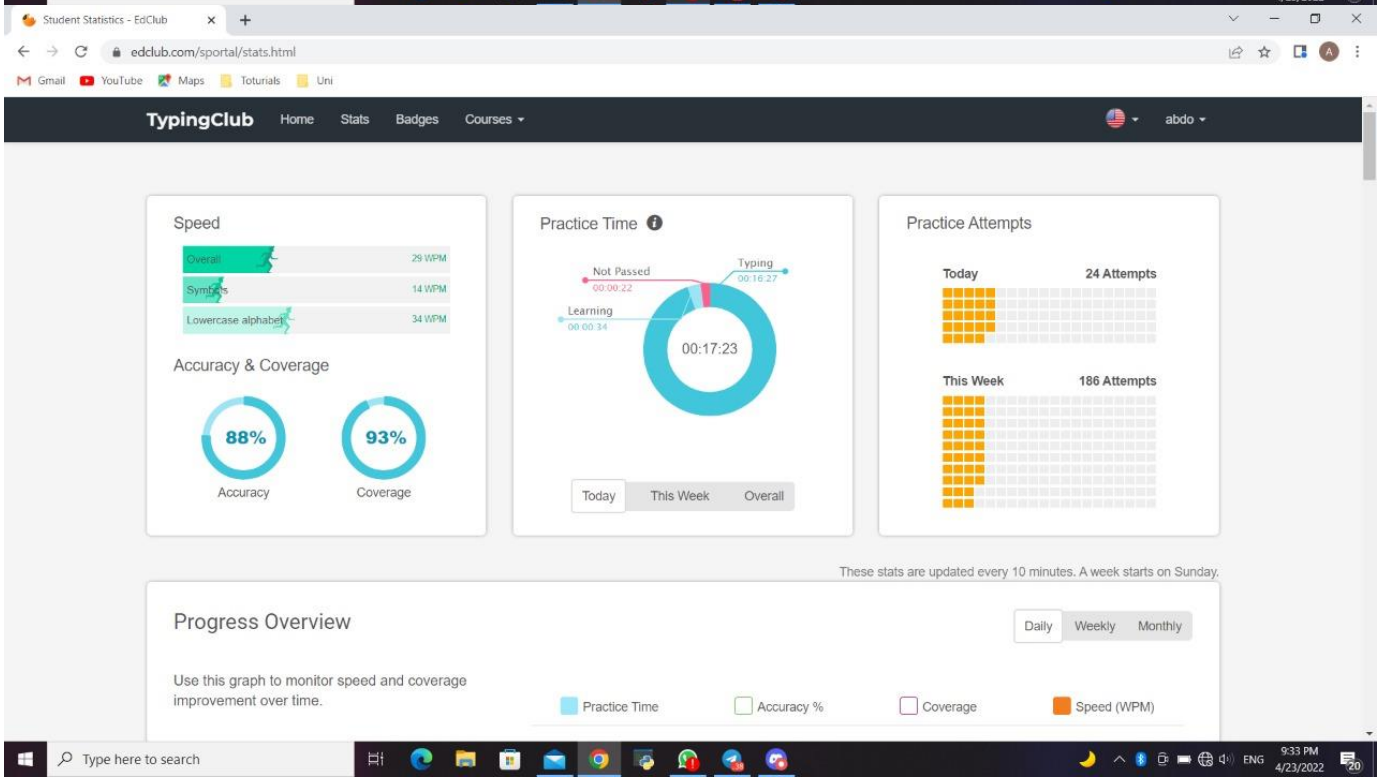
Student Statistics - EdClub
edclub.com/sportal/stats.html
Gmail YouTube Maps Toturials Uni
TypingClub Home Stats Badges Courses abdo
Speed
Overall 29 WPM
Symbols 14 WPM
Lowercase alphabet 34 WPM
Accuracy & Coverage
88% Accuracy
93% Coverage
Practice Time
Not Passed 00:00:22
Typing 00:16:27
Learning 00:00:34
00:17:23
Today This Week Overall
Practice Attempts
Today 24 Attempts
This Week 186 Attempts
These stats are updated every 10 minutes. A week starts on Sunday.
Progress Overview
Daily Weekly Monthly
Use this graph to monitor speed and coverage improvement over time.
Practice Time Accuracy % Coverage Speed (WPM)
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ENG 9:33 PM 4/23/2022

3) 20210398

Filter 3: Merge Images .

We created a new image to store the merged image in. after iteration through all of the pixels,

we used this operation:

merged_image[i][j]=image[i][j] +image2[i][j];

merged_image is the merged image to be saved. Image is the original image. And image2 is the

second image to be merged

Filter 6: Darken and Lighten Image .

First make a void function called Darken_lighten_image().

Identify variable choice as integer.

Print (“Do you want to Darken or lighten”).

Input choice.

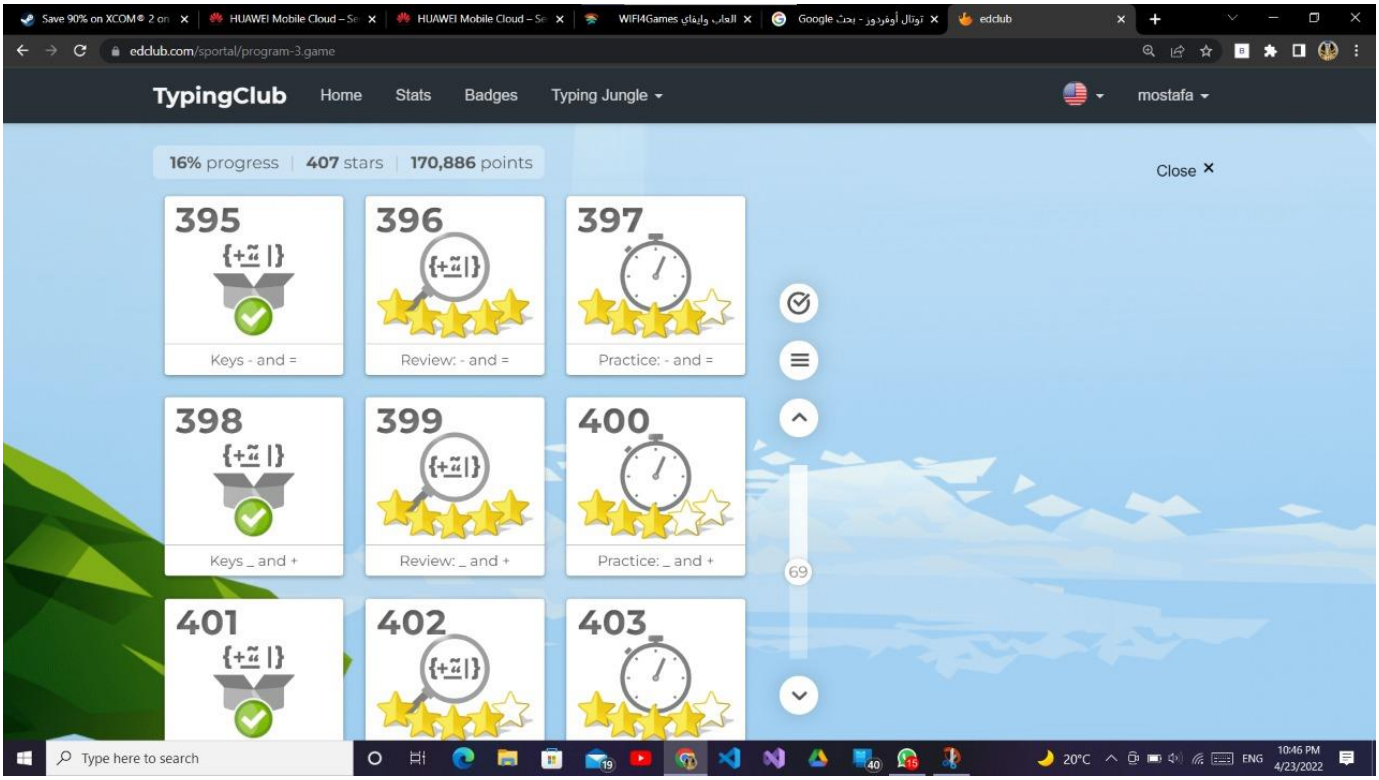
```
If choice = 1
For integer i = 0; i < SIZE {
        For integer j = 0; j < SIZE {
                If image [i] [j] > 50
                Subtract 50 from image [i] [j]
        }
}
Else {
For i = 0; i < SIZE; {
        For j = 0; j < SIZE {
                If image [i] [j] < 205
                Add 50 to image
                }
        }
}
```

Filter 9: Shrink Image.

```
void shrink()
string number;
 int Wtrue;
 Wtrue = true;
input "press \" 4 \" for 1/4... press \" 3 \" for 1/3...press \"2\" for 1/2: ";
 print = number;
 if (number == "2" || number == "3" || number == "4")
break;
 else {
 print "enter a valid input ! " << endl
 for (int i = 0; i < SIZE; i+=2) {
 for (int j = 0; j< SIZE; j+=2) {
 if (number == "2")
outimage[i/2][j/2] = image1[i][j];
 else if (number == "3")
outimage[i/3][j/3] = image1[i][j]
else if (number == "4")
outimage[i/4][j/4] = image1[i][j]
```

Filter c: Blur Image.

```
Delcale i j
void blur ()
int average = 0;
 for (int i=0 ; i < SIZE ; i++){
 for (int j=0 ; j < SIZE ; j++){
 for (int k = -1; k <= 1; k ++){
 for (int l = -1; l <= 1 ;l++
 if((i + k) >= 0 && (i + k) <= 255 && (j + l) >= 0 && (j + l) <= 255){
 average += image1[i + k][j + l];
printimage[i][j] = (average / 9);
making average = 0 again
 average = 0;
```


edclub.com/sportal/program-3.game
TypingClub
Home
Stats
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Typing Jungle
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16% progress | 407 stars | 170,886 points
Close
395
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Review: - and =
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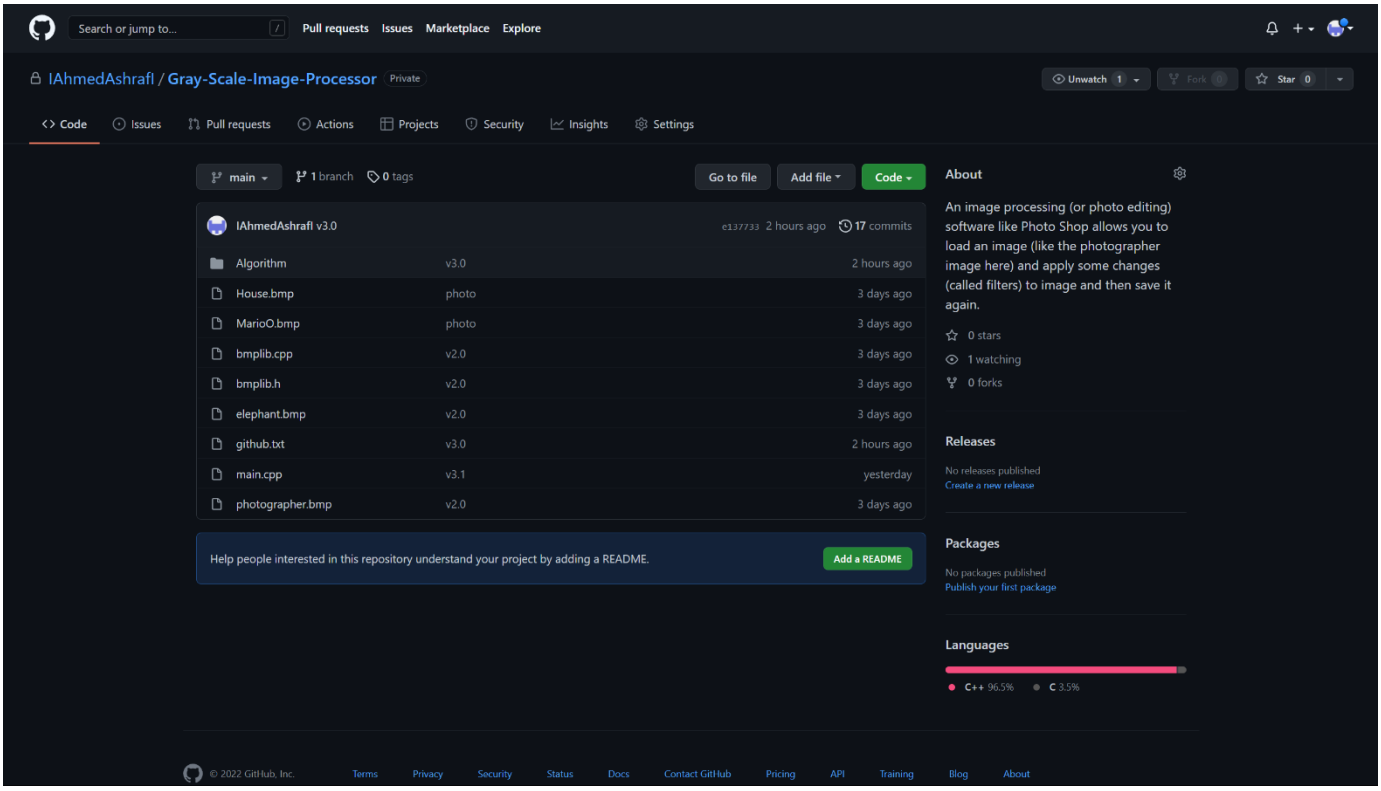
GitHub


Search or jump to...
Pull requests
Issues
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Private
Unwatch 1
Fork 0
Star 0
Code
Issues
Pull requests
Actions
Projects
Security
Insights
Settings
main
1 branch
0 tags
Go to file
Add file
Code
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e137733 2 hours ago
17 commits
Algorithm v3.0 2 hours ago
House.bmp photo 3 days ago
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bmplib.cpp v2.0 3 days ago
bmplib.h v2.0 3 days ago
elephant.bmp v2.0 3 days ago
github.txt v3.0 2 hours ago
main.cpp v3.1 yesterday
photographer.bmp v2.0 3 days ago
Help people interested in this repository understand your project by adding a README.
Add a README
About
An image processing (or photo editing) software like Photo Shop allows you to load an image (like the photographer image here) and apply some changes (called filters) to image and then save it again.
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1 watching
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C 3.5%
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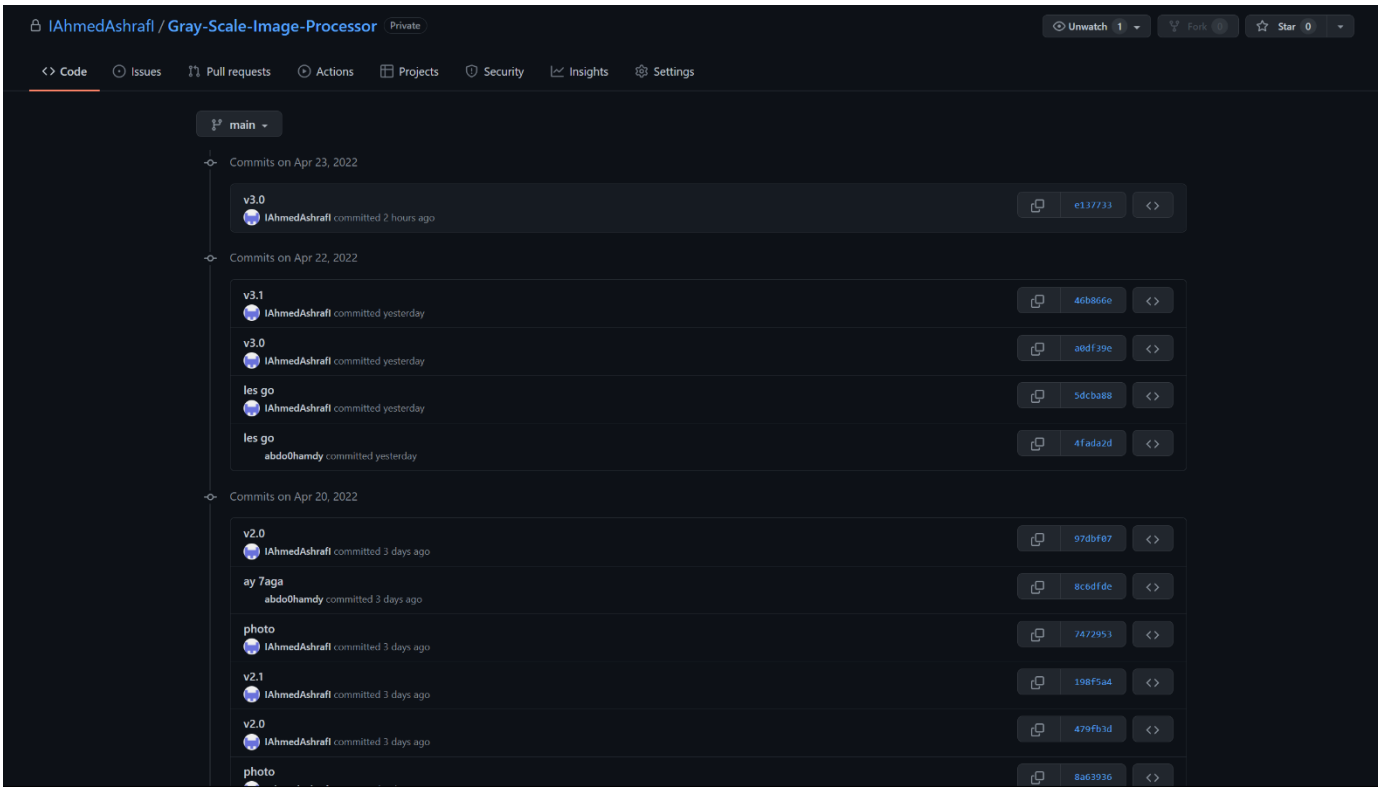
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Private
Unwatch 1
Fork 0
Star 0
Code
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Pull requests
Actions
Projects
Security
Insights
Settings
main
Commits on Apr 23, 2022
v3.0
IAhmedAshrafI committed 2 hours ago
e137733
Commits on Apr 22, 2022
v3.1
IAhmedAshrafI committed yesterday
46b866e
v3.0
IAhmedAshrafI committed yesterday
a0df39e
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IAhmedAshrafI committed yesterday
5dcba88
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abdo0hamdy committed yesterday
4fada2d
Commits on Apr 20, 2022
v2.0
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abdo0hamdy committed 3 days ago
8c6dfde
photo
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7472953
v2.1
IAhmedAshrafI committed 3 days ago
198f5a4
v2.0
IAhmedAshrafI committed 3 days ago
479fb3d
photo
8a63936

Faculty of Computers and Information **جامعة القاهرة – كلية الحاسبات و المعلومات**

Programming 1 – 2022 - Assignment 3 **الفرقة الأولى – برمجة الحاسبات ١ – ٢٠٢٢ - المسألة ٣**

اسم الطالب.....Name ..... **التاريخ** Date ..... **المجموعة**..... Group

اسم الطالب.....Name ..... **التاريخ** Date ..... **المجموعة**..... Group

اسم الطالب.....Name ..... **التاريخ** Date ..... **المجموعة**..... Group

We give oath that we have fully authored all the programs we submitted for Assignment 3 and we did not copy work from the net, from other colleagues or from any sources.

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