**CS112**: Programming - 1 Assignment 3 – 7th 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 .

# D:\Learning\Assignment 3 -- Programming\Gray-Scale-Image-Processor\4_22_2022 11_40_33 PM.png

# 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 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]) ;

}

}

# 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

}

}

}



