CS112: Programming - 1
Assignment 2 – 7th April

Cairo University, Faculty of Computers
and Artificial Intelligence

FACULTY OF COMPUTERS AND ARTIFICAL INTELLIGENCE, CAIRO UNIVERSITY

CS112: Structured Programming

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Second Semester

Assignment 3

Part 1

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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 .

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
                }
        }
}
```