

## DIP ASSIGNMENT

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**AG#:** 2019-AG-6081

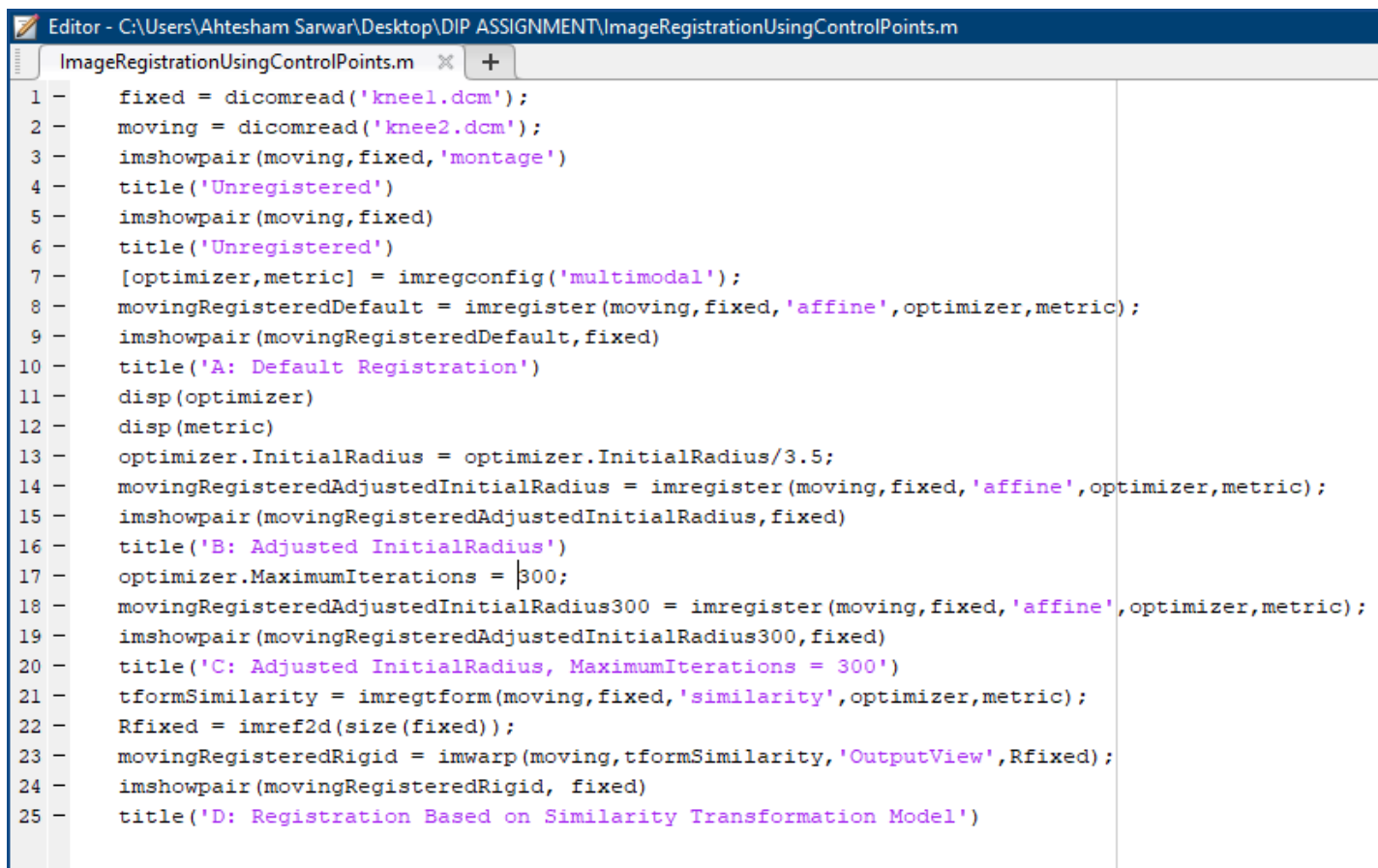
**CLASS:** BSCS 6<sup>th</sup>

**SUBJECT:** Digital Image Processing

**DATE:** 19 May, 2022

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**CODE:**

The image shows a screenshot of a MATLAB script editor window. The title bar reads "Editor - C:\Users\Ahtesham Sarwar\Desktop\DIP ASSIGNMENT\ImageRegistrationUsingControlPoints.m". The script file is named "ImageRegistrationUsingControlPoints.m". The code is a MATLAB script for image registration, consisting of 25 lines. It starts by loading two DICOM images, 'knee1.dcm' and 'knee2.dcm', and displaying them side-by-side with the title 'Unregistered'. Then, it performs a default affine registration using 'imregister' and displays the result with the title 'A: Default Registration'. Next, it adjusts the initial radius of the optimizer and performs another affine registration, displaying the result with the title 'B: Adjusted InitialRadius'. Then, it sets the maximum iterations to 300 and performs a third affine registration, displaying the result with the title 'C: Adjusted InitialRadius, MaximumIterations = 300'. Finally, it performs a similarity-based registration using 'imregtform' and 'imwarp', displaying the result with the title 'D: Registration Based on Similarity Transformation Model'.

```
1 - fixed = dicomread('knee1.dcm');
2 - moving = dicomread('knee2.dcm');
3 - imshowpair(moving, fixed, 'montage')
4 - title('Unregistered')
5 - imshowpair(moving, fixed)
6 - title('Unregistered')
7 - [optimizer, metric] = imregconfig('multimodal');
8 - movingRegisteredDefault = imregister(moving, fixed, 'affine', optimizer, metric);
9 - imshowpair(movingRegisteredDefault, fixed)
10 - title('A: Default Registration')
11 - disp(optimizer)
12 - disp(metric)
13 - optimizer.InitialRadius = optimizer.InitialRadius/3.5;
14 - movingRegisteredAdjustedInitialRadius = imregister(moving, fixed, 'affine', optimizer, metric);
15 - imshowpair(movingRegisteredAdjustedInitialRadius, fixed)
16 - title('B: Adjusted InitialRadius')
17 - optimizer.MaximumIterations = 300;
18 - movingRegisteredAdjustedInitialRadius300 = imregister(moving, fixed, 'affine', optimizer, metric);
19 - imshowpair(movingRegisteredAdjustedInitialRadius300, fixed)
20 - title('C: Adjusted InitialRadius, MaximumIterations = 300')
21 - tformSimilarity = imregtform(moving, fixed, 'similarity', optimizer, metric);
22 - Rfixed = imref2d(size(fixed));
23 - movingRegisteredRigid = imwarp(moving, tformSimilarity, 'OutputView', Rfixed);
24 - imshowpair(movingRegisteredRigid, fixed)
25 - title('D: Registration Based on Similarity Transformation Model')
```

**OUTPUT:**

**E: Registration from Affine Model Based on Similarity Initial Condition**

