**CS-423 CG**

**ASSIGNMENT#4**

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**REPORT**

**Introduction**

The purpose of this project is to read an image in PPM (Portable Pixmap) format, apply an affine transformation to it (such as translation, scaling, rotation, or shearing), and output the transformed image back into a PPM file.

**Steps:**

* Writing code to read the initial .ppm file having data the image
* Reading the matrix Values for the Affine Transformation [a1 a2 b1 a3 a4 b2]T
* Applying reverse transformation on each pixel of the image
* Bilinear Interpolating 4 neighbors of the pixel using
* Generate the reverse Transformed Image Object
* Copy the reversed transformed Image into original image
* Write the Transformed Image to a .ppm file as output

**Challenges**

Following challenges were faced during this assignment

* **Memory Management**:  
  The use of dynamically allocated memory for both images (original and transformed) to prevent memory leakage. Memory allocation and deallocation are implemented using new and deleted. **freeImage ()** prevents memory leaks by deallocating arrays before the program exits.
* **Transformed Image Never Cropped**Additional task that I done in this code was to make it like generated transformed image never crops. For this I had to calculate new width and height for the transformed image, then write the resultant image as. ppm with new width and height values, this ensures that warped image is written fully into the ppm without any crop.