

# IT528: Topics in Image Analysis Assignment 1

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**Deadline for submitting the report: Tuesday morning 10 am**

1. Given two Gaussians with standard deviations  $\sigma_1$  and  $\sigma_2$ , find out the standard deviation of the Gaussian obtained by convolving the above two Gaussians.
2. The 1-D linear heat equation is given by

$$u_t = u_{xx}.$$

For  $x \in \Omega = [0, 1] \subset \mathbb{R}$ , implement the heat equation for an ideal step edge, with spatial discretization  $\Delta x = 1/20$  in  $\Omega$ . Try out various time-steps  $\Delta t$  and plot few representative heat equation solutions. Pen down your observations.