

# Advanced Numerical Techniques

Assignment - 7

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## Question 1

Generate surface plot and solve this by ADI technique:-

$$U_t = U_{xx} + U_{yy}, t > 0$$

$$U(0, x, y) = 0 \text{ for all } 0 \leq x, y \leq 1$$

on the boundary.

$$U(x, y) = \exp(0.2 * \pi * x) \cdot \sin(0.2 * \pi * y)$$

$$\delta_x = \delta_y = 0.25, r = 1/6;$$

## Solution:

The value of u after the required number of iterations is:

$u(:, :, 77) =$

0	0.1564	0.3090	0.4540	0.5878
0	0.2760	0.4614	0.5879	0.6878
0	0.3343	0.5497	0.6914	0.8047
0	0.3425	0.5870	0.7658	0.9416
0	0.2932	0.5792	0.8510	1.1018