

MATH 610 PA 3 Report

Problem 1

Figure 1: Problem 1 error table

final time	n time steps	m	mesh size	L2 error	L2 rate	H1 error	H1 rate
1	20	10	1	0.1		0.5	
		20	0.5	0.025	2	0.25	1
		40	0.25	0.00625	2	0.125	1
	40	10	1	0.1		0.5	
		20	0.5	0.025	2	0.25	1
		40	0.25	0.00625	2	0.125	1
	80	10	1	0.1		0.5	
		20	0.5	0.025	2	0.25	1
		40	0.25	0.00625	2	0.125	1
3	20	10	1	0.1		0.5	
		20	0.5	0.025	2	0.25	1
		40	0.25	0.00625	2	0.125	1
	40	10	1	0.1		0.5	
		20	0.5	0.025	2	0.25	1
		40	0.25	0.00625	2	0.125	1
	80	10	1	0.1		0.5	
		20	0.5	0.025	2	0.25	1
		40	0.25	0.00625	2	0.125	1

Problem 2

Figure 2: Problem 2 $t = 1$ $n = 20$ $m = 10$
Approximate

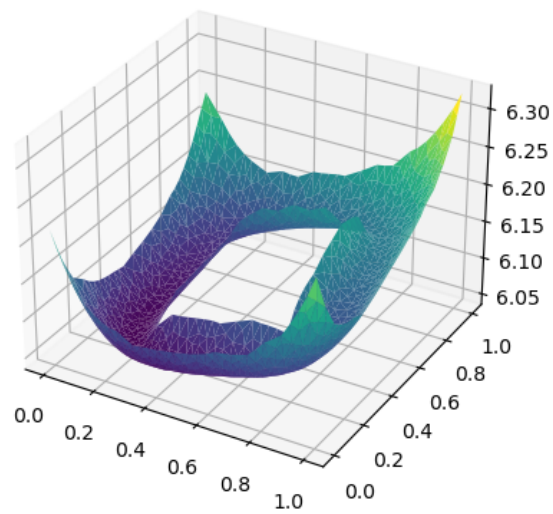


Figure 3: Problem 2 $t = 1$ $n = 20$ $m = 20$
Approximate

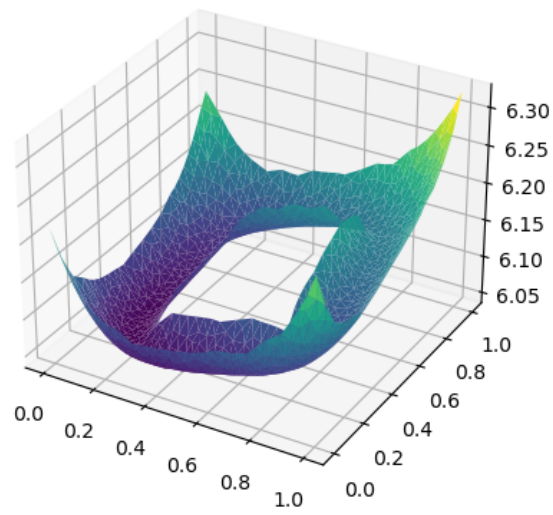


Figure 4: Problem 2 $t = 1$ $n = 20$ $m = 40$
Approximate

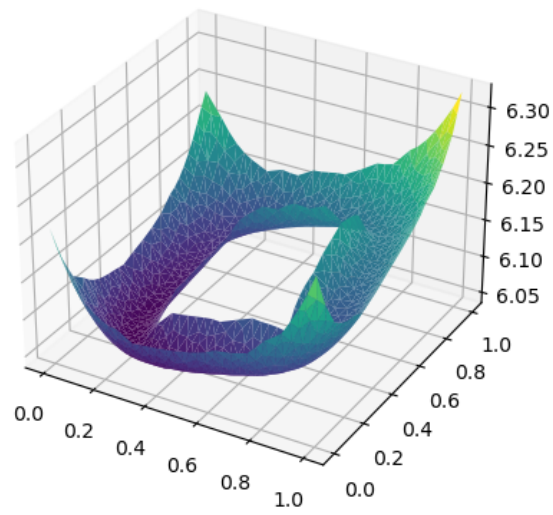


Figure 5: Problem 2 $t = 1$ $n = 40$ $m = 10$
Approximate

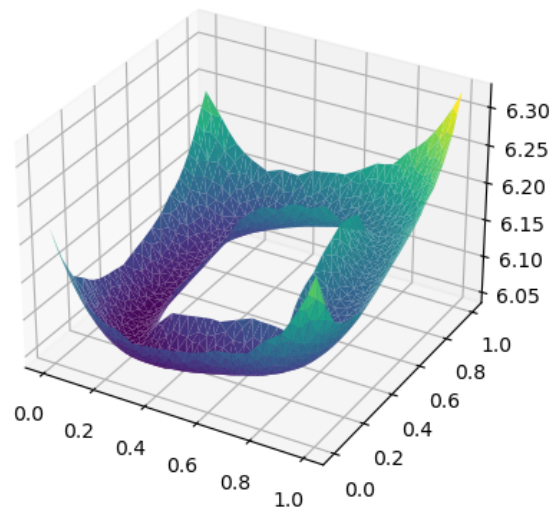


Figure 6: Problem 2 $t = 1$ $n = 40$ $m = 20$
Approximate

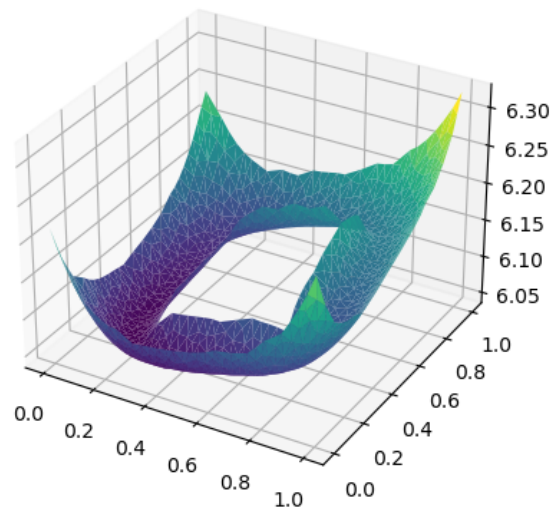


Figure 7: Problem 2 $t = 1$ $n = 40$ $m = 40$
Approximate

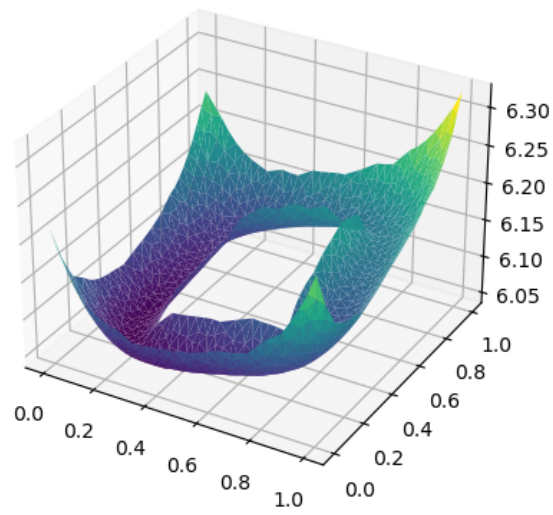


Figure 8: Problem 2 $t = 1$ $n = 80$ $m = 10$
Approximate

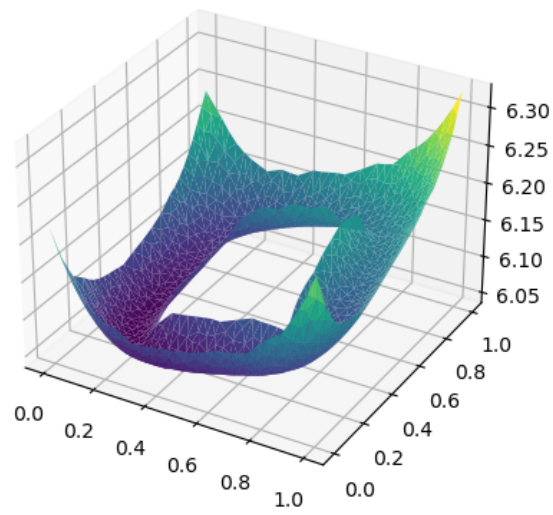


Figure 9: Problem 2 $t = 1$ $n = 80$ $m = 20$
Approximate

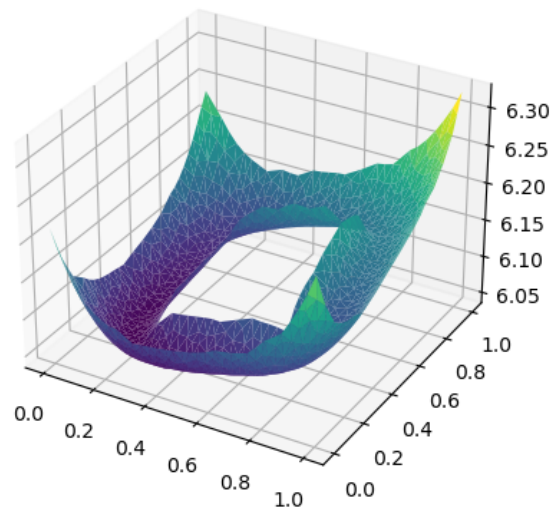


Figure 10: Problem 2 $t = 1$ $n = 80$ $m = 40$
Approximate

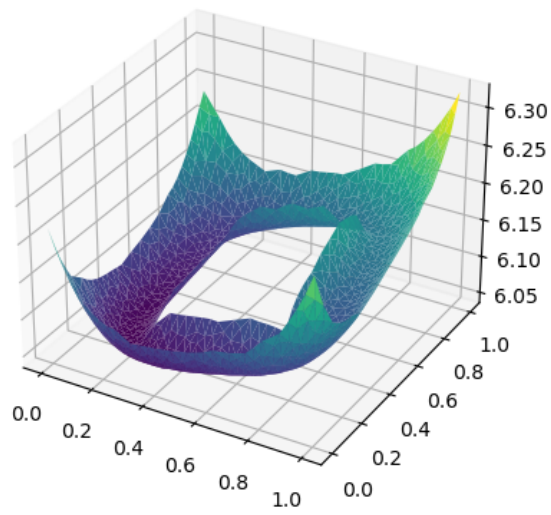


Figure 11: Problem 2 $t = 3$ $n = 20$ $m = 10$
Approximate

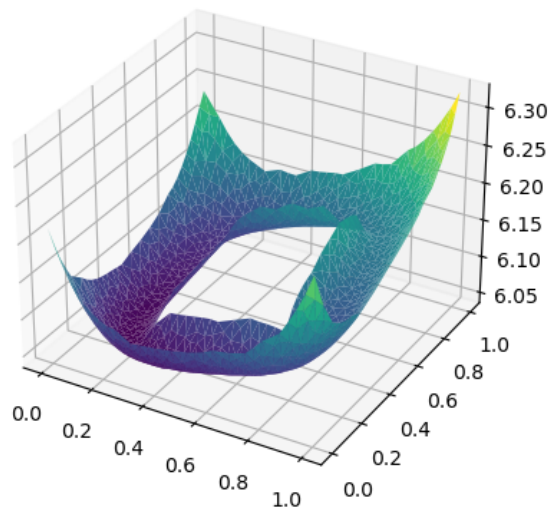


Figure 12: Problem 2 $t = 3$ $n = 20$ $m = 20$
Approximate

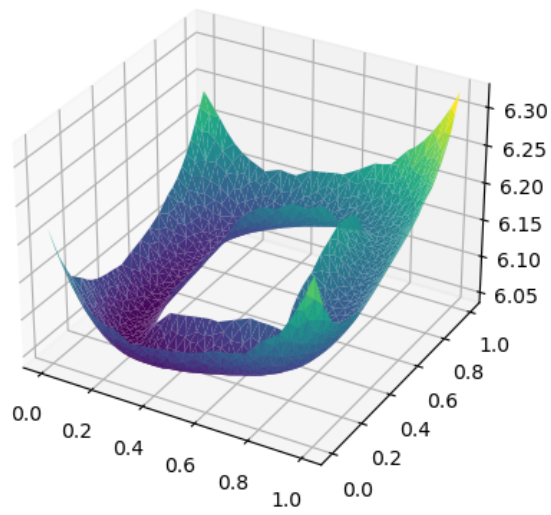


Figure 13: Problem 2 $t = 3$ $n = 20$ $m = 40$
Approximate

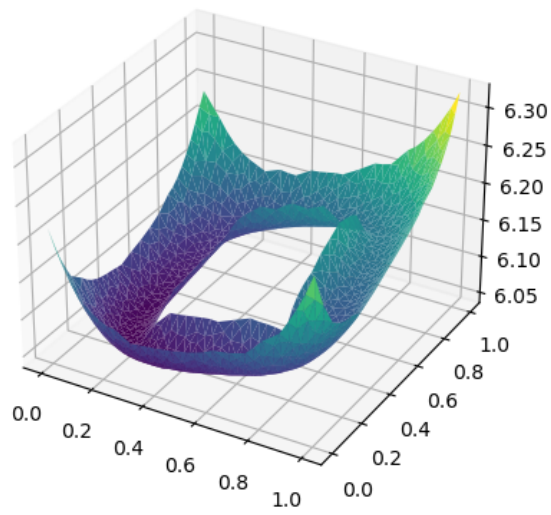


Figure 14: Problem 2 $t = 3$ $n = 40$ $m = 10$
Approximate

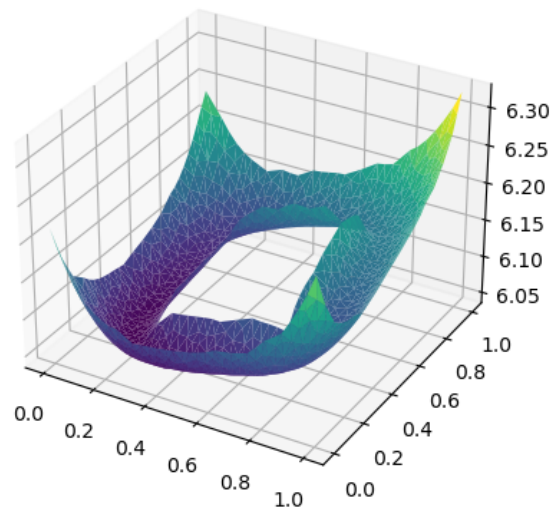


Figure 15: Problem 2 $t = 3$ $n = 40$ $m = 20$
Approximate

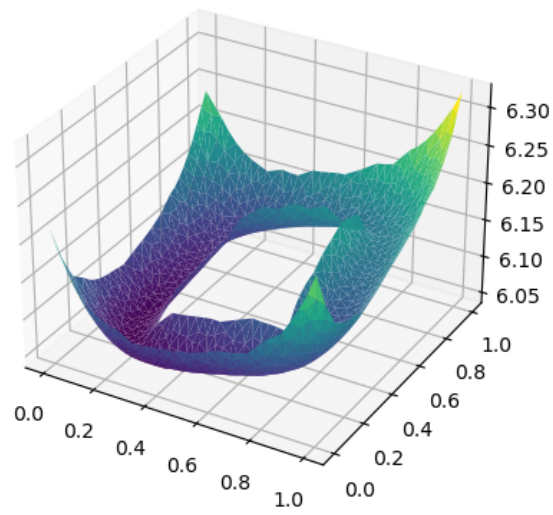


Figure 16: Problem 2 $t = 3$ $n = 40$ $m = 40$
Approximate

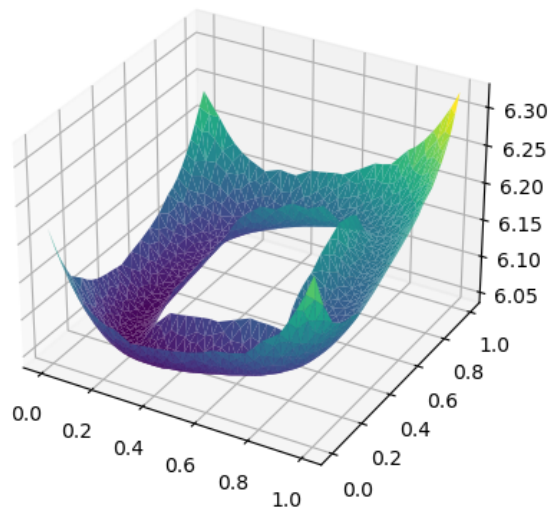


Figure 17: Problem 2 $t = 3$ $n = 80$ $m = 10$
Approximate

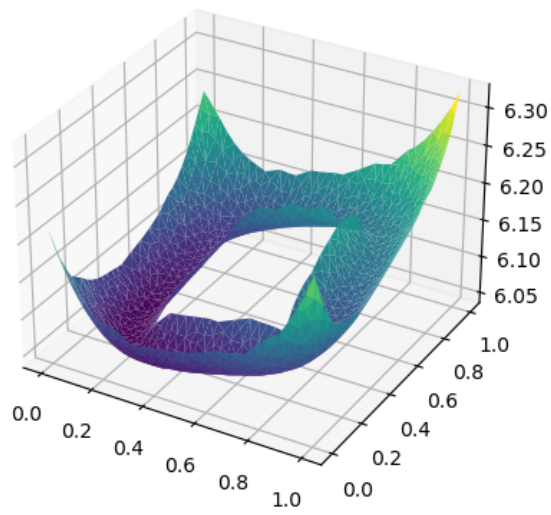


Figure 18: Problem 2 $t = 3$ $n = 80$ $m = 20$
Approximate

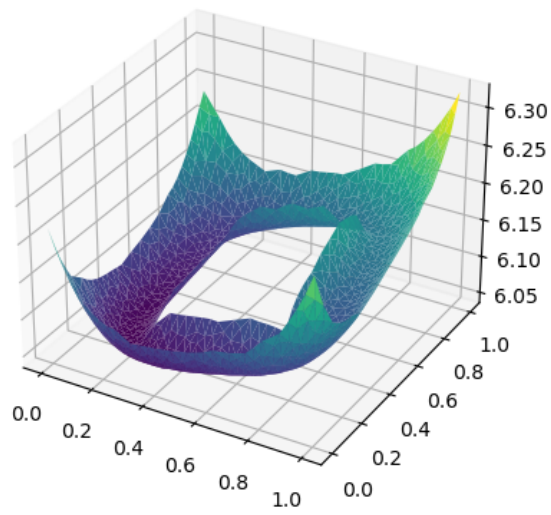
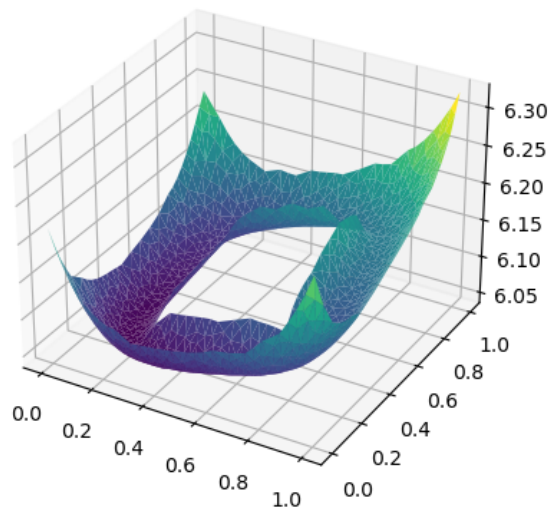


Figure 19: Problem 2 $t = 3$ $n = 80$ $m = 40$
Approximate



Problem 3

Figure 20: Problem 3 $t = 1$ $n = 20$ $m = 10$
Approximate

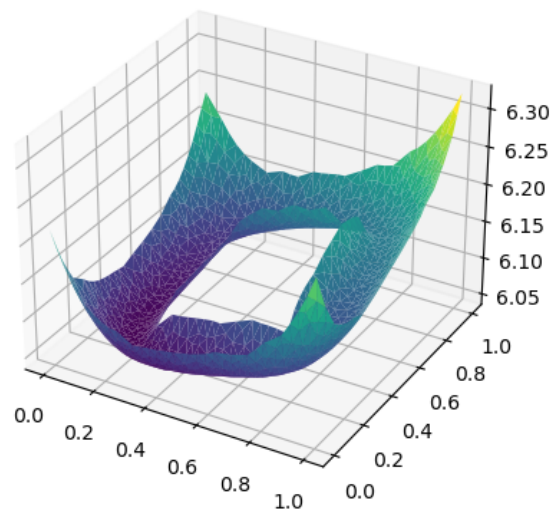


Figure 21: Problem 3 $t = 1$ $n = 20$ $m = 20$
Approximate

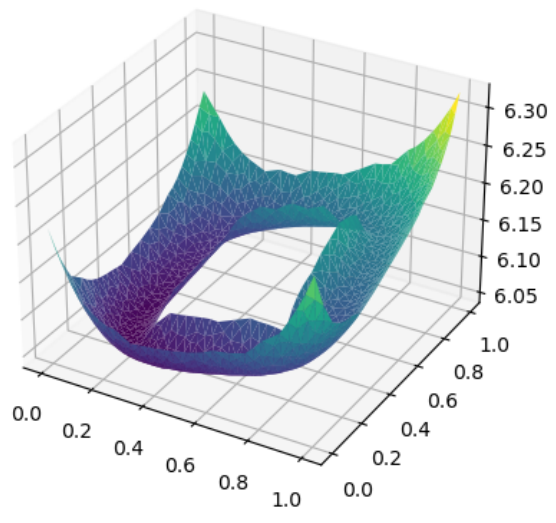


Figure 22: Problem 3 $t = 1$ $n = 20$ $m = 40$
Approximate

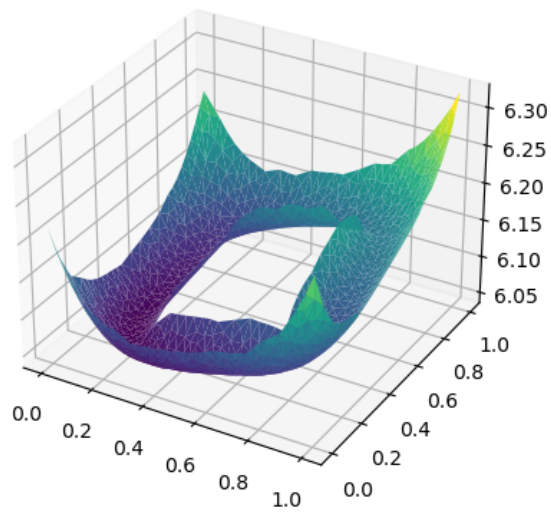


Figure 23: Problem 3 $t = 1$ $n = 40$ $m = 10$
Approximate

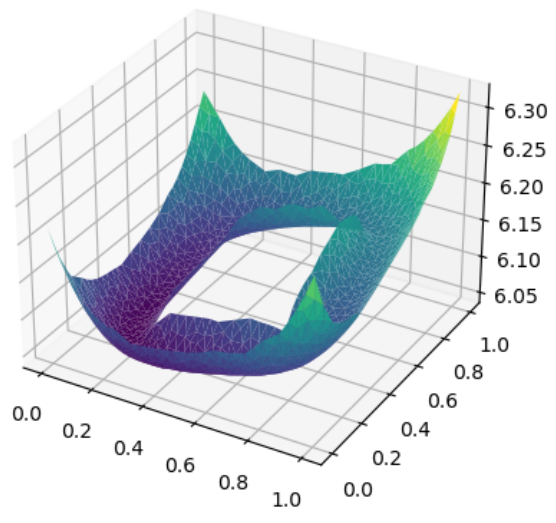


Figure 24: Problem 3 $t = 1$ $n = 40$ $m = 20$
Approximate

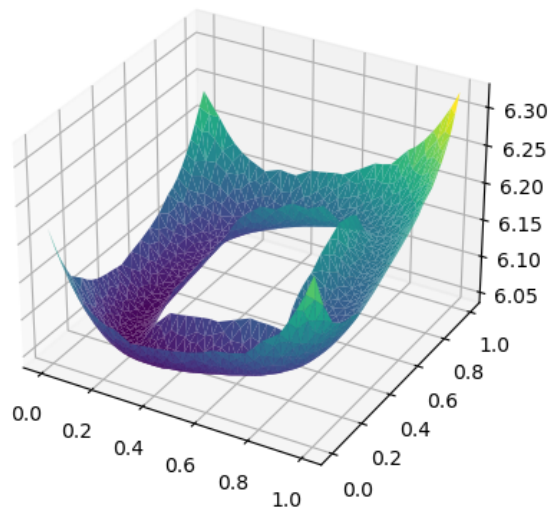


Figure 25: Problem 3 $t = 1$ $n = 40$ $m = 40$
Approximate

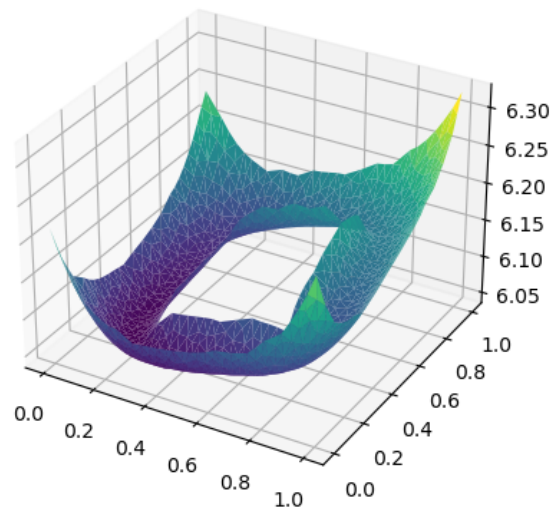


Figure 26: Problem 3 $t = 1$ $n = 80$ $m = 10$
Approximate

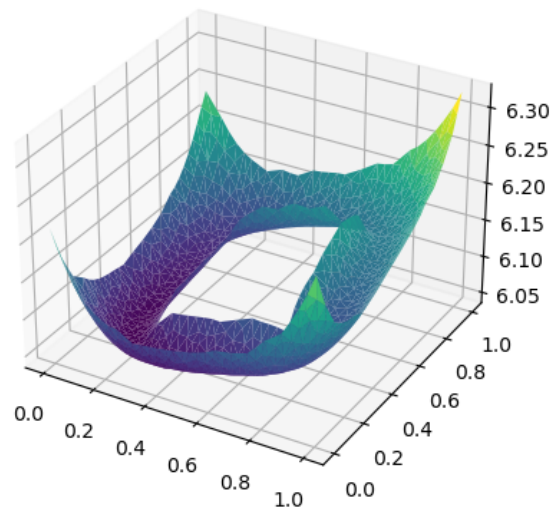


Figure 27: Problem 3 $t = 1$ $n = 80$ $m = 20$
Approximate

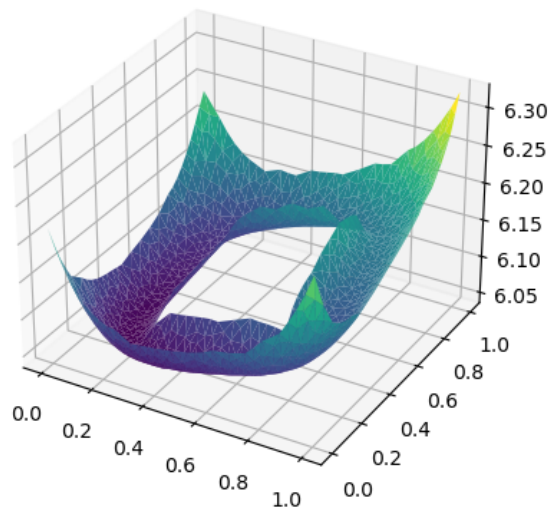


Figure 28: Problem 3 $t = 1$ $n = 80$ $m = 40$
Approximate

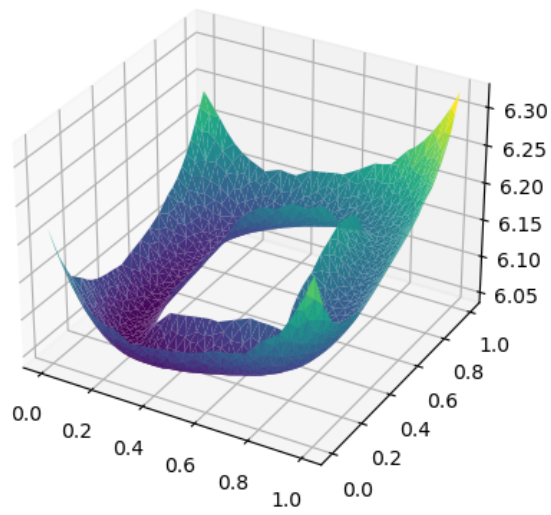


Figure 29: Problem 3 $t = 3$ $n = 20$ $m = 10$
Approximate

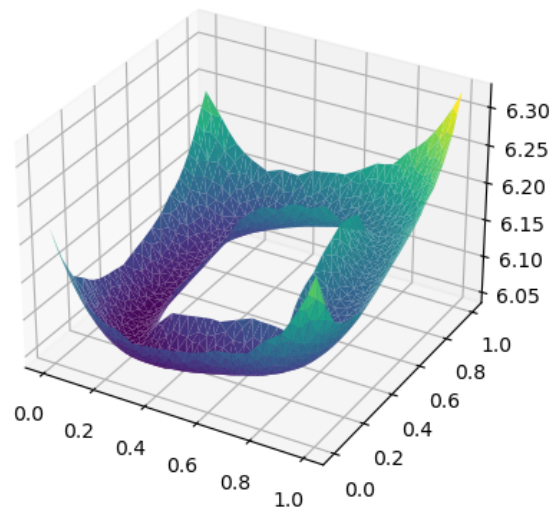


Figure 30: Problem 3 $t = 3$ $n = 20$ $m = 20$
Approximate

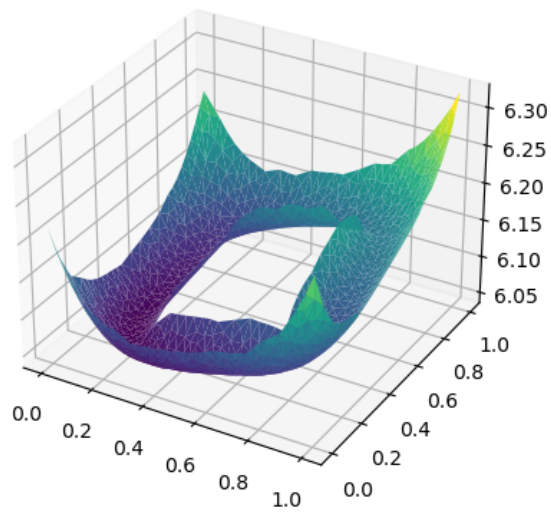


Figure 31: Problem 3 $t = 3$ $n = 20$ $m = 40$
Approximate

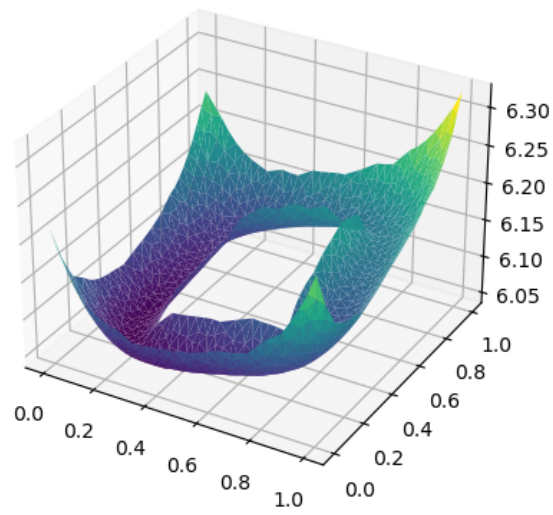


Figure 32: Problem 3 $t = 3$ $n = 40$ $m = 10$
Approximate

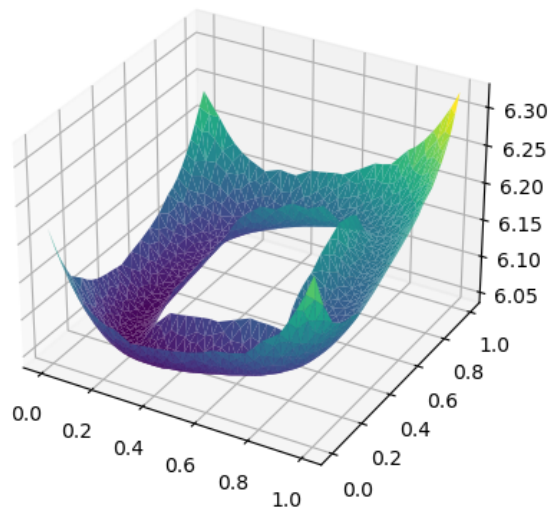


Figure 33: Problem 3 $t = 3$ $n = 40$ $m = 20$
Approximate

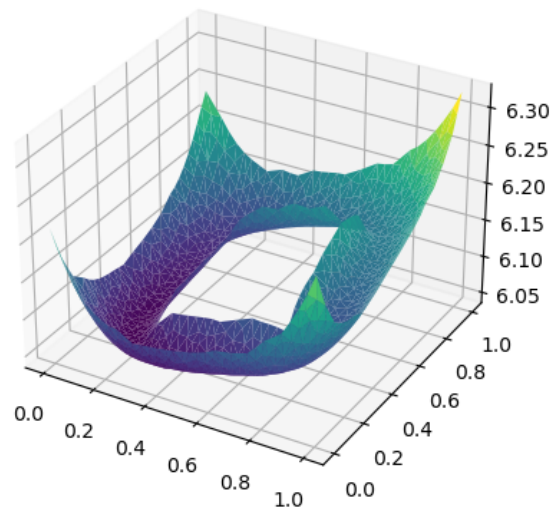


Figure 34: Problem 3 $t = 3$ $n = 40$ $m = 40$
Approximate

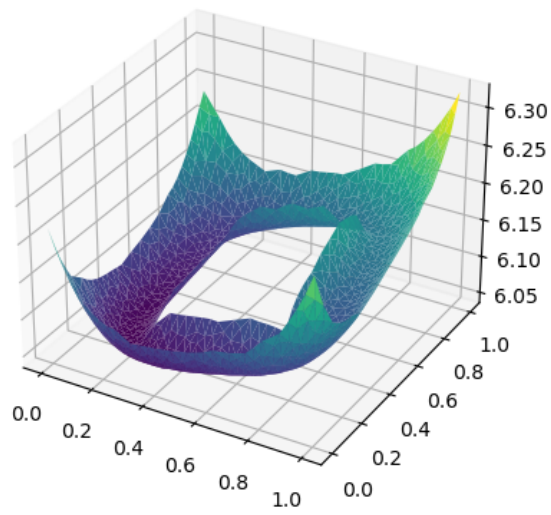


Figure 35: Problem 3 $t = 3$ $n = 80$ $m = 10$
Approximate

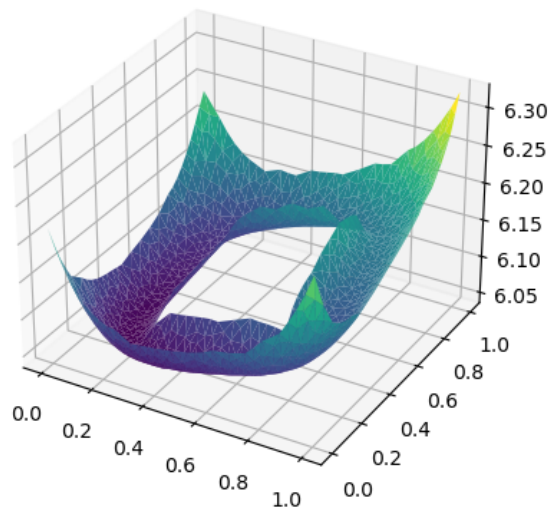


Figure 36: Problem 3 $t = 3$ $n = 80$ $m = 20$
Approximate

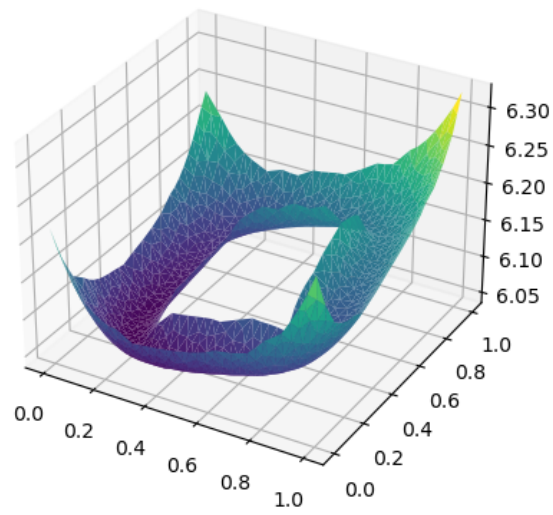


Figure 37: Problem 3 $t = 3$ $n = 80$ $m = 40$
Approximate

