	X_1	X ₂	Fitness Evaluation	Calculation Note / Comment
Starting Solution, S ₀	2		_	$=x_1 * cos(x_1) * sin(x_2) + 0.5 * x_2$
starting solution, sol		-	0.2-132	X1
	X_1	X ₂	Fitness Evaluation	
Current Solution	2			$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
		4	0.2432	$\begin{bmatrix} -x_1 & \cos(x_1) & \sin(x_2) & \cos x_2 \end{bmatrix}$
Done?	FALSE			
lt.	eration 1			l
Best Neighbor (current)	2	2	0.2432	current solution from past iteration
Neighbors of (2, 2)	\mathbf{x}_1	x_2	Fitness Evaluation	
Neighbor 1 (x1 + 1, x2)	3	2	-1.7006	$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
Neighbor 2 (x1 - 1, x2)	1	2	1.4913	
Neighbor 3 (x1, x2 + 1)	2	3	1.3825	
Neighbor 4 (x1, x2 - 1)	2		-0.2004	
(New) Best Neighbor	3		-1.7006	=min(neighbors, best_neighbor)
is Best Neighbor Same as Old?	FALSE			
Done?	FALSE			done if same
	X ₁	X ₂	Fitness Evaluation	1
Current Solution	3		-1.7006	$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
	eration 2		1 7000	
Best Neighbor (current)	3	2	_1 /1106	current solution from past iteration
2001108	3		-1.7000	antene solution from pase teration
Neighbors of (3, 2)	x ₁	x ₂	Fitness Evaluation	
			Fitness Evaluation	$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
Neighbors of (3, 2)	x ₁	x ₂	Fitness Evaluation	$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2)	x ₁	X ₂	Fitness Evaluation 2 -1.3774	$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2)	x ₁ 4 2	X ₂	Fitness Evaluation 2 -1.3774 2 0.2432	=x ₁ *cos(x ₁)*sin(x ₂) + 0.5*x ₂
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1)	x ₁ 4 2 3	X ₂	Fitness Evaluation 2 -1.3774 2 0.2432 3 1.0809 1 -1.9991	$=x_1*cos(x_1)*sin(x_2) + 0.5*x_2$
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor	x ₁ 4 2 3 3	X ₂	Fitness Evaluation 2 -1.3774 2 0.2432 3 1.0809 1 -1.9991	=x ₁ *cos(x ₁)*sin(x ₂) + 0.5*x ₂
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old?	x ₁ 4 2 3 3 FALSE	X ₂	Fitness Evaluation 2 -1.3774 2 0.2432 3 1.0809 1 -1.9991	=x ₁ *cos(x ₁)*sin(x ₂) + 0.5*x ₂ =min(neighbors, best_neighbor)
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor	x ₁ 4 2 3 3	X ₂	Fitness Evaluation 2 -1.3774 2 0.2432 3 1.0809 1 -1.9991	$=x_1*cos(x_1)*sin(x_2) + 0.5*x_2$
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old?	x ₁ 4 2 3 3 FALSE	x ₂	Fitness Evaluation 2 -1.3774 2 0.2432 3 1.0809 1 -1.9991	=x ₁ *cos(x ₁)*sin(x ₂) + 0.5*x ₂ =min(neighbors, best_neighbor)
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old? Done?	x ₁ 4 2 3 3 FALSE FALSE	x ₂	Fitness Evaluation 2 -1.3774 2 0.2432 3 1.0809 1 -1.9991 L -1.9991 Fitness Evaluation	=x ₁ *cos(x ₁)*sin(x ₂) + 0.5*x ₂ =min(neighbors, best_neighbor) done if same
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old?	x ₁ 4 2 3 3 FALSE	x ₂	Fitness Evaluation 2 -1.3774 2 0.2432 3 1.0809 1 -1.9991 L -1.9991 Fitness Evaluation	=x ₁ *cos(x ₁)*sin(x ₂) + 0.5*x ₂ =min(neighbors, best_neighbor)
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old? Done? Current Solution	x ₁ 4 2 3 3 FALSE FALSE x ₁ 3	x ₂	Fitness Evaluation 2 -1.3774 2 0.2432 3 1.0809 1 -1.9991 L -1.9991 Fitness Evaluation	=x ₁ *cos(x ₁)*sin(x ₂) + 0.5*x ₂ =min(neighbors, best_neighbor) done if same
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old? Done? Current Solution	x ₁ 4 2 3 3 FALSE FALSE x ₁ 3	x ₂	Fitness Evaluation 2	$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=\min(\text{neighbors, best_neighbor})$ done if same $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old? Done? Current Solution	x ₁ 4 2 3 3 FALSE FALSE x ₁ 3	x ₂	Fitness Evaluation 2	=x ₁ *cos(x ₁)*sin(x ₂) + 0.5*x ₂ =min(neighbors, best_neighbor) done if same
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old? Done? Current Solution	x ₁ 4 2 3 3 FALSE FALSE x ₁ 3	x ₂	Fitness Evaluation 2	$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=\min(\text{neighbors, best_neighbor})$ done if same $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old? Done? Current Solution It Best Neighbors of (3, 1)	x ₁ 4 2 3 3 FALSE FALSE x ₁ 3	x ₂ 3 3 3 4 x ₂ x ₂ x ₂ x ₂	Fitness Evaluation 2	$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=\min(\text{neighbors, best_neighbor})$ done if same $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old? Done? Current Solution It Best Neighbor (current) Neighbors of (3, 1) Neighbor 1 (x1 + 1, x2)	x ₁ 4 2 3 3 FALSE FALSE x ₁ 3 eration 3	x ₂ x ₂ x ₂ x ₂ x ₂	Fitness Evaluation 2	$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=\min(\text{neighbors, best_neighbor})$ done if same $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old? Done? Current Solution It Best Neighbor (current) Neighbors of (3, 1) Neighbor 2 (x1 - 1, x2)	x ₁ 4 2 3 3 FALSE FALSE x ₁ 3 eration 3 x ₁ 4	x ₂ x ₂ x ₂ x ₂ x ₂ x ₂	Fitness Evaluation 2	$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=\min(\text{neighbors, best_neighbor})$ done if same $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old? Done? Current Solution It Best Neighbor (current) Neighbors of (3, 1) Neighbor 1 (x1 + 1, x2)	x ₁ 4 2 3 3 FALSE FALSE x ₁ 3 eration 3 3	x ₂ x ₂ x ₂ x ₂ x ₂ x ₂	Fitness Evaluation 2	$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=\min(\text{neighbors, best_neighbor})$ done if same $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old? Done? Current Solution It Best Neighbors of (3, 1) Neighbors of (3, 1) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1)	x ₁ 4 2 3 3 FALSE FALSE x ₁ 3 eration 3 x ₁ 4 2 3	x ₂ x ₂ x ₂ x ₂ x ₂	Fitness Evaluation 2	$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=\min(\text{neighbors, best_neighbor})$ done if same $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old? Done? Current Solution It Best Neighbors of (3, 1) Neighbors of (3, 1) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1)	x ₁ 4 2 3 3 FALSE FALSE x ₁ 3 eration 3 x ₁ 4 2 3	x ₂ x ₂ x ₂ x ₂ x ₂	Fitness Evaluation 2	$=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=\min(\text{neighbors, best_neighbor})$ done if same $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$ $=x_1*\cos(x_1)*\sin(x_2) + 0.5*x_2$
Neighbors of (3, 2) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1) (New) Best Neighbor is Best Neighbor Same as Old? Done? Current Solution Neighbors of (3, 1) Neighbor 1 (x1 + 1, x2) Neighbor 2 (x1 - 1, x2) Neighbor 3 (x1, x2 + 1) Neighbor 4 (x1, x2 - 1)	x ₁ 4 2 3 3 FALSE FALSE x ₁ 3 eration 3 4 2 3 3 3	X ₂ 3 3 3 3 4 X ₂ 3 4 X ₂ 4 (1)	Fitness Evaluation 2	$=x_1*\cos(x_1)*\sin(x_2)+0.5*x_2$ $=\min(\text{neighbors, best_neighbor})$ done if same $=x_1*\cos(x_1)*\sin(x_2)+0.5*x_2$ $=x_1*\cos(x_1)*\sin(x_2)+0.5*x_2$