

labAI-35.pl SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)

File Edit Settings Run Debug Help

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```
fruit(apple, red).
fruit(banana, yellow).
fruit(grape, purple).
fruit(orange, orange).
fruit(watermelon, green).
match_fruit_color(Fruit, Color) :-  
fruit(Fruit, Color).

fruits_with_color(FruitList, Color) :-  
findall(Fruit, match_fruit_color(Fruit, Color), FruitList).
```

c:/users/lalitha sri/onedrive/documents/labai-35.pl compiled Line: 1

32°C Light rain Search ENG IN 14:24 12-08-2025

labA1-34.pl [modified] SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)

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```
can_get_banana :-  
    monkey(on_floor),  
    box(under_banana),  
    climb_box,  
    grab_banana.  
  
monkey(on_floor).  
box(under_banana).  
  
climb_box :-  
    write('Monkey climbs the box.'), nl.  
  
grab_banana :-  
    write('Monkey grabs the banana!'), nl.
```

Colourising buffer ... done, 0.00 seconds, 18 fragments Line: 17

3 32°C Light rain Search ENG IN 14:22 12-08-2025

The image shows a Windows desktop environment with two Python windows open and a taskbar at the bottom.

Code Editor Window:

```
labAI-7.py - C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-7.py (3.13.5)
File Edit Format Run Options Window Help
A = {1, 2, 3, 4}
B = {3, 4, 5, 6}

print("Union:", A | B)
print("Intersection:", A & B)
print("Difference:", A - B)
print("Symmetric Difference:", A ^ B)
```

IDLE Shell Window:

```
IDLE Shell 3.13.5
File Edit Shell Debug Options Window Help
Python 3.13.5 (tags/v3.13.5:6cb20a2, Jun 11 2025, 16:15:46) [MSC v.1943 64 bit (AMD64)]
on win32
Enter "help" below or click "Help" above for more information.

>>>
= RESTART: C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-7.py
Union: {1, 2, 3, 4, 5, 6}
Intersection: {3, 4}
Difference: {1, 2}
Symmetric Difference: {1, 2, 5, 6}
```

Taskbar:

- Weather icon: 32°C Light rain
- Search bar
- Start button
- File Explorer
- Calculator
- Google Chrome
- OneDrive
- Microsoft Edge
- File Manager
- PowerShell
- Terminal
- Visual Studio Code
- System tray icons: battery (65%), signal, volume, language (ENG IN), date (12-08-2025), time (13:55)

The screenshot shows a Windows desktop environment with two Python windows open side-by-side. The left window is titled "labAI-6.py - C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-6.py (3.13.5)" and contains the following code:

```
my_list = [1, 2, 3]
my_list.insert(1, 10)
print("After insert:", my_list)
my_list.append(20)
print("After append:", my_list)
my_list.extend([30, 40])
print("After extend:", my_list)
my_list.remove(10)
print("After remove:", my_list)
del my_list[0]
print("After del:", my_list)
```

The right window is titled "IDLE Shell 3.13.5" and shows the output of the executed code:

```
File Edit Shell Debug Options Window Help
Python 3.13.5 (tags/v3.13.5:6cb20a2, Jun 11 2025, 16:15:46) [MSC v.1943 64 bit (AMD64)]
on win32
Enter "help" below or click "Help" above for more information.

>>>
= RESTART: C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-6.py
After insert: [1, 10, 2, 3]
After append: [1, 10, 2, 3, 20]
After extend: [1, 10, 2, 3, 20, 30, 40]
After remove: [1, 2, 3, 20, 30, 40]
After del: [2, 3, 20, 30, 40]
```

The taskbar at the bottom of the screen displays various icons, including the Start button, a search bar, and icons for File Explorer, Edge, Google Chrome, and other applications. The system tray shows the date and time as 12-08-2025, 13:54.

The image shows a Windows desktop environment with two windows open. On the left is a code editor window titled "labAI-11.py - C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-11.py (3.13.5)". It contains Python code for solving the N-Queens problem. On the right is an "IDLE Shell 3.13.5" window showing the output of the program, which is an 8x8 chessboard with 8 queens placed such that no two are in the same row, column, or diagonal. The taskbar at the bottom displays various icons for system status and application launch.

```
N = 8

def print_board(board):
    for row in board:
        print(" ".join("Q" if col else "." for col in row))
    print()

def is_safe(board, row, col):
    for i in range(row):
        if board[i][col] or (col-row+i) >= 0 and board[i][col-row+i] or (col+row-i < N and board[i][col+row-i]):
            return False
    return True

def solve(board, row=0):
    if row == N:
        print_board(board)
        return
    for col in range(N):
        if is_safe(board, row, col):
            board[row][col] = 1
            solve(board, row+1)
            board[row][col] = 0

solve([[0]*N for _ in range(N)])
```

The screenshot shows a Windows desktop environment with two Python windows open and a taskbar at the bottom.

Left Window (Code Editor):

```
labA1-3.py - C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labA1-3.py (3.13.5)
File Edit Format Run Options Window Help
matrix = [[1, 2, 3],
          [4, 5, 6],
          [7, 8, 9]]
rows = len(matrix)
cols = len(matrix[0])
transpose_matrix = [[0 for x in range(rows)] for y in range(cols)]
for i in range(rows):
    for j in range(cols):
        transpose_matrix[j][i] = matrix[i][j]
print("Original Matrix:")
for row in matrix:
    print(row)
print("Transposed Matrix:")
for row in transpose_matrix:
    print(row)
```

Right Window (IDLE Shell):

```
IDLE Shell 3.13.5
File Edit Shell Debug Options Window Help
Python 3.13.5 (tags/v3.13.5:6cb20a2, Jun 11 2025, 16:15:46) [MSC v.1943 64 bit (AMD64)]
on win32
Enter "help" below or click "Help" above for more information.
>>>
==== RESTART: C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labA1-3.py ====
Original Matrix:
[1, 2, 3]
[4, 5, 6]
[7, 8, 9]
Transposed Matrix:
[1, 4, 7]
[2, 5, 8]
[3, 6, 9]
>>>
```

Taskbar:

- Top Stories (Kerala woman al...)
- Search bar
- Icons for File Explorer, Edge, Google Chrome, and other applications
- Language settings: ENG IN
- Date and time: 13:52 12-08-2025

The screenshot shows a Windows desktop environment with two Python windows open side-by-side. The left window is titled "labAI-4.py - C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-4.py (3.13.5)" and contains the following code:

```
File Edit Format Run Options Window Help
sentence = input("Enter a sentence: ")
words = sorted(sentence.split())
sorted_sentence = " ".join(words)
print("Sorted sentence:", sorted_sentence)
```

The right window is titled "IDLE Shell 3.13.5" and shows the output of running the script. It includes the Python version information, a restart message, and the user's input followed by the sorted output.

```
File Edit Shell Debug Options Window Help
Python 3.13.5 (tags/v3.13.5:6cb20a2, Jun 11 2025, 16:15:46) [MSC v.1943 64 bit (AMD64)]
on win32
Enter "help" below or click "Help" above for more information.

>>>
= RESTART: C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-4.py
Enter a sentence: hi i am lalitha
Sorted sentence: am hi i lalitha
```

The taskbar at the bottom of the screen displays the weather (32°C, Light rain), the Start button, a search bar, and several pinned application icons. The system tray shows the date (12-08-2025), time (13:53), and language settings (ENG IN).

The screenshot shows a Windows desktop environment with two open windows. On the left is a code editor window titled "labAI-5.py - C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-5.py (3.13.5)". It contains the following Python code:

```
File Edit Format Run Options Window Help
nested_list = [[1, 2, 3], [4, 5, 6], [7, 8, 9]]
print("Nested List:", nested_list)
my_list = [1, 2, 3, 4, 5]
print("Length of List:", len(my_list))
list1 = [1, 2, 3]
list2 = [4, 5, 6]
concatenated_list = list1 + list2
print("Concatenated List:", concatenated_list)
my_list = [1, 2, 3, 4, 5]
if 3 in my_list:
    print("3 is in the list")
else:
    print("3 is not in the list")

my_list = [1, 2, 3, 4, 5]
for item in my_list:
    print(item)
my_list = [1, 2, 3, 4, 5]
print("First element:", my_list[0])
print("Last element:", my_list[-1])
print("Sliced List:", my_list[1:4])
```

On the right is an IDLE Shell window titled "IDLE Shell 3.13.5". It shows the output of running the script:

```
File Edit Shell Debug Options Window Help
Python 3.13.5 (tags/v3.13.5:6cb20a2, Jun 11 2025, 16:15:46) [MSC v.1943 64 bit (AMD64)]
on win32
Enter "help" below or click "Help" above for more information.

>>>
= RESTART: C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-5.py
Nested List: [[1, 2, 3], [4, 5, 6], [7, 8, 9]]
Length of List: 5
Concatenated List: [1, 2, 3, 4, 5, 6]
3 is in the list
1
2
3
4
5
First element: 1
Last element: 5
Sliced List: [2, 3, 4]
```

The taskbar at the bottom shows various pinned icons and the system tray with weather information (32°C, Light rain), date (12-08-2025), and time (13:53).

The screenshot shows a Windows desktop environment with two Python windows open and a taskbar at the bottom.

Left Window: A code editor window titled "labAI-9.py - C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-9.py (3.13.5)". It contains the following Python code:

```
import string
input_string = input("Enter a string: ")
no_punctuations = input_string.translate(str.maketrans("", "", string.punctuation))
print("String with no punctuations:", no_punctuations)
```

Right Window: An IDLE Shell window titled "IDLE Shell 3.13.5". It shows the Python interpreter running:

```
File Edit Shell Debug Options Window Help
Python 3.13.5 (tags/v3.13.5:6cb20a2, Jun 11 2025, 16:15:46) [MSC v.1943 64 bit (AMD64)]
on win32
Enter "help" below or click "Help" above for more information.
>>>
= RESTART: C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-9.py
Enter the year: 2025
Enter the month: 7
      July 2025
Mo Tu We Th Fr Sa Su
  1  2  3  4  5  6
  7  8  9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30 31
```

Taskbar: The taskbar at the bottom displays the following icons and information:

- Weather icon: 32°C Light rain
- Search bar
- Start button
- File Explorer
- Edge browser
- Google Chrome
- OneDrive
- File Manager
- Calculator
- Power User
- Clipboard
- Language: ENG IN
- Wi-Fi signal
- Battery level
- Date and time: 13:57 12-08-2025

addmatrix.py - C:/Users/Lalitha sri/AppData/Local/Programs/Python/Python313/addmatrix.py (3.13.5)

File Edit Format Run Options Window Help

```
matrix1 = [[1, 2, 3],
[4, 5, 6],
[7, 8, 9]]
matrix2 = [[10, 11, 12],
[13, 14, 15],
[16, 17, 18]]
result = [[0, 0, 0],
[0, 0, 0],
[0, 0, 0]]
for i in range(len(matrix1)):
    for j in range(len(matrix1[0])):
        result[i][j] = matrix1[i][j] + matrix2[i][j]
for row in result:
    print(row)
```

IDLE Shell 3.13.5

File Edit Shell Debug Options Window Help

Python 3.13.5 (tags/v3.13.5:6cb20a2, Jun 11 2025, 16:15:46) [MSC v.1943 64 bit (AMD64)] on win32

Enter "help" below or click "Help" above for more information.

>>> ===== RESTART: C:/Users/Lalitha sri/AppData/Local/Programs/Python/Python313/addmatrix.py =====

[11, 13, 15]
[17, 19, 21]
[23, 25, 27]

>>> |

Ln: 8 Col: 0

The screenshot shows a Windows desktop environment with two Python windows open side-by-side. The left window is titled "labAI-8.py - C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-8.py (3.13.5)" and contains the following code:

```
import calendar
year = int(input("Enter the year: "))
month = int(input("Enter the month: "))
print(calendar.month(year, month))
```

The right window is titled "IDLE Shell 3.13.5" and contains the following output from a Python shell:

```
File Edit Shell Debug Options Window Help
Python 3.13.5 (tags/v3.13.5:6cb20a2, Jun 11 2025, 16:15:46) [MSC v.1943 64 bit (AMD64)]
on win32
Enter "help" below or click "Help" above for more information.

>>> = RESTART: C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-8.py
Enter the year: 2025
Enter the month: 7
      July 2025
Mo Tu We Th Fr Sa Su
  1  2  3  4  5  6
  7  8  9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30 31

>>> |
```

The taskbar at the bottom of the screen displays the following icons and information:

- Weather icon: 32°C Light rain
- Search bar
- Start button
- File Explorer
- Task View
- Edge browser
- Google Chrome
- OneDrive
- File History
- Taskbar settings
- Network status
- Language: ENG IN
- Date and time: 13:56 12-08-2025

```

labA1-10.py - C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labA1-10.py (3.13.5)
File Edit Format Run Options Window Help
from collections import deque
goal = "123456780"
moves = {0:[1,3],1:[0,2,4],2:[1,5],3:[0,4,6],4:[1,3,5,7],5:[2,4,8],6:[3,7],7:[4,6,8],8:[5,7]}
def bfs(start):
    q = deque([(start, [])])
    visited = {start}
    while q:
        state, path = q.popleft()
        if state == goal:
            return path + [state]
        zero = state.index("0")
        for m in moves[zero]:
            lst = list(state)
            lst[zero], lst[m] = lst[m], lst[zero]
            new_state = ''.join(lst)
            if new_state not in visited:
                visited.add(new_state)
                q.append((new_state, path + [state]))
start = "123456780"
result = bfs(start)
for step in result:
    for i in range(0,9,3):
        print(step[i:i+3])
print()

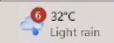
```

```

IDLE Shell 3.13.5
File Edit Shell Debug Options Window Help
Python 3.13.5 (tags/v3.13.5:6cb20a2, Jun 11 2025, 16:15:46) [MSC v.1943 64 bit (AMD64)]
on win32
Enter "help" below or click "Help" above for more information.
>>>
= RESTART: C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labA1-10.py
125
340
678
125
348
670
125
348
607
125
308
647
125
038
647
125
638
407
125
638
470
125
630
478
125
603
478
125
063
478
025
163
478

```

Ln: 1 Col: 0 Ln: 93 Col: 0



13:57
12-08-2025

```
labA1-12.py - C:\Users\Latitha sri\AppData\Local\Programs\Python\Python313\labA1-12.py (3.13.5)
File Edit Format Run Options Window Help
from collections import deque

def water_jug(x, y, target):
    q = deque([(0, 0)])
    visited = set()
    while q:
        a, b = q.popleft()
        if (a, b) in visited:
            continue
        visited.add((a, b))
        print(a, b)
        if a == target or b == target:
            return
        q.extend([
            (x, b), (a, y), (0, b), (a, 0),
            (a - min(a, y - b), b + min(a, y - b)),
            (a + min(b, x - a), b - min(b, x - a))
        ])
water_jug(4, 3, 2)
```

```
IDLE Shell 3.13.5
File Edit Shell Debug Options Window Help
Python 3.13.5 (tags/v3.13.5:6cb20a2, Jun 11 2025, 16:15:46) [MSC v.1943 64 bit (AMD64)]
on Win32
Enter "help" below or click "Help" above for more information.
>>>
= RESTART: C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labA1-12.py
0 0
4 0
0 3
4 3
1 3
3 0
1 0
3 3
0 1
4 2
I
```



labA1-32.pl

File Edit Browse Compile Prolog Pce Help

```
female(pam).
female(liz).
female(ann).
female(pat).

male(tom).
male(bob).
male(jim).

parent(pam, liz).
parent(tom, liz).

parent(pam, ann).
parent(tom, ann).

parent(liz, pat).
parent(bob, pat).

parent(ann, jim).
parent(bob, jim).

mother(X, Y) :-  
    female(X),  
    parent(X, Y).

father(X, Y) :-  
    male(X),  
    parent(X, Y).

grandfather(X, Y) :-  
    male(X),  
    parent(X, Z),  
    parent(Z, Y).

grandmother(X, Y) :-  
    female(X),  
    parent(X, Z),  
    parent(Z, Y).
```

c:/users/lalitha sri/onedrive/documents/laba1-32.pl compiled

Line: 1

SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)

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For built-in help, use ?- help(Topic). or ?- apropos(Word).

?-
?- mother(pam,tom).
false.

?- mother(pam,liz).
true

32°C Light rain Search ENG IN 14:13 12-08-2025

```
labAI-13.py - C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-13.py (3.13.5)
File Edit Format Run Options Window Help
for S in range(1, 10):
    for E in range(10):
        for N in range(10):
            for D in range(10):
                for M in range(1, 10):
                    for O in range(10):
                        for R in range(10):
                            for Y in range(10):
                                digits = [S, E, N, D, M, O, R, Y]
                                # Check all digits are unique
                                if len(set(digits)) != 8:
                                    continue
                                SEND = 1000*S + 100*E + 10*N + D
                                MORE = 1000*M + 100*O + 10*R + E
                                MONEY = 10000*M + 1000*O + 100*N + 10*E + Y
                                if SEND + MORE == MONEY:
                                    print("Solution:")
                                    print("SEND =", SEND)
                                    print("MORE =", MORE)
                                    print("MONEY =", MONEY)
                                    exit()

IDLE Shell 3.13.5
File Edit Shell Debug Options Window Help
Python 3.13.5 (tags/v3.13.5:6cb20a2, Jun 11 2025, 16:15:46) [MSC v.1943 64 bit (AMD64)]
on win32
Enter "help" below or click "Help" above for more information.
>>> = RESTART: C:\Users\Lalitha sri\AppData\Local\Programs\Python\Python313\labAI-13.py
Solution:
SEND = 9567
MORE = 1085
MONEY = 10652
>>>
```

32°C Light rain

Search

14:00 12-08-2025

labAI-33.pl SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)

File Edit Settings Run Debug Help

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For built-in help, use ?- help(Topic). or ?- apropos(Word).

?-

% c:/users/lalitha sri/onedrive/documents/labai-33 compiled 0.00 sec. -2 clauses
?- suggest_diet(obesity,Diet)
Diet = [apple, carrot, fish, spinach] ■

```
labAI-33.pl
File Edit Browse Compile Prolog Pce Help
labAI-33.pl

food(apple, fruit, sweet, low_calorie).
food(banana, fruit, sweet, high_calorie).
food(carrot, vegetable, savory, low_calorie).
food(potato, vegetable, savory, high_calorie).
food(chicken, meat, savory, high_protein).
food(fish, seafood, savory, high_protein).
food(spinach, vegetable, savory, high_iron).
food(almonds, nut, savory, high_fat).

diet(heart_disease, [apple, carrot, chicken, fish, almonds]).
diet(diabetes, [apple, carrot, fish, spinach, almonds]).
diet(anemia, [spinach, chicken, fish, almonds]).

diet(obesity, [apple, carrot, fish, spinach]).

suggest_diet(Disease, Diet) :-
    diet(Disease, Diet).
suggest_diet(Disease, Diet) :-
    diet(Disease, AllowedFoods),
    findall(Food, (food(Food, _, _, _), member(Food, AllowedFoods)), Diet).

c:/users/lalitha sri/onedrive/documents/labai-33.pl compiled Line: 1
```

3 32°C Light rain Search 14:16 ENG IN 12-08-2025

<pre> File Edit Format Run Options Window Help def vacuum_cleaner(): # Take input for Room A and B room_A = input("Is Room A dirty? (yes/no): ").lower() room_B = input("Is Room B dirty? (yes/no): ").lower() # Starting position is Room A print("\nVacuum is in Room A.") if room_A == 'yes': print("Cleaning Room A...") room_A = 'no' # Move to Room B print("Moving to Room B.") if room_B == 'yes': print("Cleaning Room B...") room_B = 'no' print("\nFinal Status:") print(f"Room A: {room_A}") print(f"Room B: {room_B}") print("All clean! <input checked="" type="checkbox"/>") </pre>	<pre> File Edit Shell Debug Option Window Help Python 3.13.5 (tags/v3.13.5:6cb20a2, Jun 11 2025, 16:15:46) [MSC v.1943 64 bit (AMD64)] on win32 Enter "help" below or click "Help" above for more information. >>> = RESTART: C:/Users/Lalitha sri/AppData/Local/Programs/Python/Python313/vaccumproblem.py Is Room A dirty? (yes/no): yes Is Room B dirty? (yes/no): yes Vacuum is in Room A. Cleaning Room A... Moving to Room B. Cleaning Room B... Final Status: Room A: no Room B: no All clean! <input checked="" type="checkbox"/> </pre>
<small>Ln: 26 Col: 16</small>	<small>Ln: 17 Col: 0</small>

```
helloworld.py - C:/Users/Lalitha sri/AppData/Local/Programs/Python/Python313/helloworld.py (3.13.5) — ○ ×  
File Edit Format Run Options Window Help  
  
def add(x, y):  
    return x + y  
def subtract(x, y):  
    return x - y  
def multiply(x, y):  
    return x * y  
def divide(x, y):  
    return x / y  
print("Select operation.")  
print("1.Add")  
print("2.Subtract")  
print("3.Multiply")  
print("4.Divide")  
choice = input("Enter choice(1/2/3/4): ")  
num1 = float(input("Enter first number: "))  
num2 = float(input("Enter second number: "))  
if choice == '1':  
    print(num1,"+",num2,"=", add(num1,num2))  
elif choice == '2':  
    print(num1,"-",num2,"=", subtract(num1,num2))  
elif choice == '3':  
    print(num1,"*",num2,"=", multiply(num1,num2))  
elif choice == '4':  
    print(num1,"/",num2,"=", divide(num1,num2))  
else:  
    print("Invalid input")
```

16.py - C:/Users/ashri/16.py (3.8.2)

```

File Edit Format Run Options Window Help
import heapq

def heuristic(a, b):
    return abs(a[0] - b[0]) + abs(a[1] - b[1])

def a_star(grid, start, goal):
    open_set = []
    heapq.heappush(open_set, (0, start))
    came_from = {}
    g_score = {start: 0}
    f_score = {start: heuristic(start, goal)}

    while open_set:
        current = heapq.heappop(open_set)

        if current == goal:
            path = []
            while current in came_from:
                path.append(current)
                current = came_from[current]
            return path[::-1]

        for dx, dy in [(-1, 0), (1, 0), (0, -1), (0, 1)]:
            neighbor = (current[0] + dx, current[1] + dy)
            if 0 <= neighbor[0] < len(grid) and 0 <= neighbor[1] < len(grid[0]) and grid[neighbor[0]][neighbor[1]] == 0:
                tentative_g_score = g_score[current] + 1
                if neighbor not in g_score or tentative_g_score < g_score[neighbor]:
                    came_from[neighbor] = current
                    g_score[neighbor] = tentative_g_score
                    f_score[neighbor] = g_score[neighbor] + heuristic(neighbor, goal)
                    heapq.heappush(open_set, (f_score[neighbor], neighbor))

    return None

grid = [
    [0, 0, 0, 0],
    [0, 1, 1, 0],
    [0, 0, 0, 0],
    [0, 1, 0, 0]
]
start = (0, 0)
goal = (3, 3)
path = a_star(grid, start, goal)
print("Path found:", path)

```

Python 3.8.2 Shell

```

File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:fb08b59, Feb 25 2020, 23:03:10) [MSC v.1916 64 bit (AM x64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Users/ashri/16.py =====
Path found: [(0, 1), (0, 2), (0, 3), (1, 3), (2, 3), (3, 3)]
>>>

```

Ln: 6 Col: 4

NIFTY -0.06%

Search

14:10
12-08-2025

16.py - C:/Users/ashri/16.py (3.8.2)

```

File Edit Format Run Options Window Help
import math
X, O, EMPTY = 'X', 'O', ' '
def winner(b):
    wins = [(0,1,2), (3,4,5), (6,7,8), (0,3,6), (1,4,7), (2,5,8), (0,4,8), (2,4,6)]
    for a, b, c in wins:
        if b[a] == b[b] == b[c] != EMPTY:
            return b[a]
    return None
def alphabeta(b, player, alpha, beta):
    w = winner(b)
    if w == X: return 1
    if w == O: return -1
    if EMPTY not in b: return 0
    if player == X:
        value = -math.inf
        for i in range(9):
            if b[i] == EMPTY:
                b[i] = X
                value = max(value, alphabeta(b, O, alpha, beta))
                b[i] = EMPTY
                alpha = max(alpha, value)
                if alpha >= beta:
                    break
        return value
    else:
        value = math.inf
        for i in range(9):
            if b[i] == EMPTY:
                b[i] = O
                value = min(value, alphabeta(b, X, alpha, beta))
                b[i] = EMPTY
                beta = min(beta, value)
                if alpha >= beta:
                    break
        return value
def best_move(b):
    best_val, move = -math.inf, None
    for i in range(9):
        if b[i] == EMPTY:
            b[i] = X
            score = alphabeta(b, O, -math.inf, math.inf)
            b[i] = EMPTY
            if score > best_val:
                best_val, move = score, i
    return move
board = [EMPTY]*9
print("AI picks position:", best_move(board))

Python 3.8.2 Shell
File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 23:03:10) [MSC v.1916 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
=====
RESTART: C:/Users/ashri/16.py
>>> AI picks position: 0
>>> |
```

Ln: 6 Col: 4

Rainy days ahead 32°C

Search ENG IN 14:51 12-08-2025

16.py - C:/Users/ashri/16.py (3.8.2)

```

File Edit Format Run Options Window Help
import random

class VacuumCleaner:
    def __init__(self):
        self.rooms = {'A': 'dirty', 'B': 'dirty'}
        self.position = random.choice(['A', 'B'])
        self.score = 0

    def clean(self):
        print(f"Initial state: {self.rooms}")
        print(f"Vacuum cleaner starts in room {self.position}.")

        while 'dirty' in self.rooms.values():
            print(f"\nVacuum cleaner is in room {self.position}.")
            if self.rooms[self.position] == 'dirty':
                print(f"Room {self.position} is dirty. Cleaning...")
                self.rooms[self.position] = 'clean'
                self.score += 1
            else:
                print(f"Room {self.position} is already clean.")

            self.position = 'B' if self.position == 'A' else 'A'
            print(f"\nMoving to room {self.position}.")

        print(f"\nFinal state: {self.rooms}")
        print(f"Cleaning completed with a score of {self.score}.")

vacuum = VacuumCleaner()
vacuum.clean()

```

Python 3.8.2 Shell

```

File Edit Shell Debug Options Window Help
Python 3.0.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 23:03:10) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> ===== RESTART: C:/Users/ashri/16.py =====
Initial state: {'A': 'dirty', 'B': 'dirty'}
Vacuum cleaner starts in room A.

Vacuum cleaner is in room A.
Room A is dirty. Cleaning...
Moving to room B.

Vacuum cleaner is in room B.
Room B is dirty. Cleaning...
Moving to room A.

Final state: {'A': 'clean', 'B': 'clean'}
Cleaning completed with a score of 2.
>>> |
```

Ln: 18 Col: 4

Very high UV Now

Search

13:42
12-08-2025

The screenshot shows a Windows desktop environment with several windows open:

- Code Editor:** A window titled "16.py - C:/Users/ashri/16.py (3.8.2)" containing Python code for a tic-tac-toe AI. The code includes functions for determining a winner, performing minimax search, and finding the best move.
- Terminal:** A window titled "Python 3.8.2 Shell" showing the output of running the script. It prints the Python version, the date and time, and the command "RESTART: C:/Users/ashri/16.py". It then displays the message "AI chooses position: 0".
- System Tray:** Shows icons for battery status, network connection, and system notifications.
- Taskbar:** Displays the taskbar with the current date and time (14:29, 12-08-2025), language settings (ENG IN), and other system icons.

```

16.py - C:/Users/ashri/16.py (3.8.2)
File Edit Format Run Options Window Help
def winner(board):
    wins = [(0,1,2), (3,4,5), (6,7,8), (0,3,6), (1,4,7), (2,5,8), (0,4,8), (2,4,6)]
    for a,b,c in wins:
        if board[a] == board[b] == board[c] != ' ':
            return board[a]
    return None

def minimax(board, player):
    opp = 'O' if player == 'X' else 'X'
    if winner(board) == 'X': return 1
    if winner(board) == 'O': return -1
    if ' ' not in board: return 0

    scores = []
    for i in range(9):
        if board[i] == ' ':
            board[i] = player
            score = minimax(board, opp)
            board[i] = ' '
            scores.append(score)

    return max(scores) if player == 'X' else min(scores)

def best_move(board):
    best, move = -2, None
    for i in range(9):
        if board[i] == ' ':
            board[i] = 'X'
            score = minimax(board, 'O')
            board[i] = ' '
            if score > best:
                best, move = score, i
    return move

board = [' ']*9
move = best_move(board)
print("AI chooses position:", move)

```

16.py - C:/Users/ashri/16.py (3.8.2)

```

File Edit Format Run Options Window Help
def total_cost(cost, visited, curr_pos, n, count, cost_so_far, ans):
    if count == n and cost[curr_pos][0] != 0:
        ans[0] = min(ans[0], cost_so_far + cost[curr_pos][0])
        return

    for i in range(n):
        if not visited[i] and cost[curr_pos][i] != 0:
            visited[i] = True
            total_cost(cost, visited, i, n, count + 1,
                       cost_so_far + cost[curr_pos][i], ans)
            visited[i] = False

def tsp(cost):
    n = len(cost)
    visited = [False] * n
    visited[0] = True

    ans = [float('inf')]
    total_cost(cost, visited, 0, n, 1, 0, ans)
    return ans[0]

if __name__ == "__main__":
    cost = [
        [0, 10, 15, 20],
        [10, 0, 35, 25],
        [15, 35, 0, 30],
        [20, 25, 30, 0]
    ]
    result = tsp(cost)
    print(f"The minimum cost of the tour is: {result}")

```

Python 3.8.2 Shell

```

File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:7b3ab55, Feb 25 2020, 23:03:10) [MSC v.1916 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Users/ashri/16.py =====
The minimum cost of the tour is: 80
>>>

```

Ln: 6 Col: 4

500696 -1.01%

Search ENG IN 14:03 12-08-2025

16.py - C:/Users/ashri/16.py (3.8.2)

```

File Edit Format Run Options Window Help
from collections import defaultdict

class Graph:
    def __init__(self):
        self.graph = defaultdict(list)

    def add_edge(self, u, v):
        self.graph[u].append(v)
        self.graph[v].append(u)

    def dfs_util(self, v, visited):
        visited.add(v)
        print(v, end=" ")
        for neighbor in self.graph[v]:
            if neighbor not in visited:
                self.dfs_util(neighbor, visited)

    def dfs(self, start):
        visited = set()
        self.dfs_util(start, visited)

if __name__ == " main ":
    g = Graph()
    g.add_edge(0, 1)
    g.add_edge(0, 2)
    g.add_edge(1, 3)
    g.add_edge(2, 4)
    g.add_edge(3, 5)

    print("DFS traversal starting from vertex 0:")
    g.dfs(0)

```

Python 3.8.2 Shell

```

File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:fb08762, Feb 25 2020, 23:03:10) [MSC v.1916 64 bit (AM x
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Users/ashri/16.py =====
DFS traversal starting from vertex 0:
0 1 3 5 2 4
>>>

```

Ln: 7 Col: 4

Ln: 22 Col: 0

32°C Light rain

Search

14:01
12-08-2025

16.py - C:/Users/ashri/16.py (3.8.2)

```

File Edit Format Run Options Window Help
def is_safe(graph, color, node, c):
    """Check if it's safe to color node with color c."""
    for neighbor in graph[node]:
        if color[neighbor] == c:
            return False
    return True

def graph_coloring_util(graph, m, color, node):
    """Utility function to solve m coloring problem."""
    if node == len(graph):
        return True

    for c in range(1, m + 1):
        if is_safe(graph, color, node, c):
            color[node] = c
            if graph_coloring_util(graph, m, color, node + 1):
                return True
            color[node] = 0
    return False

def graph_coloring(graph, m):
    """Solve the m coloring problem."""
    color = [-1] * len(graph)
    if not graph_coloring_util(graph, m, color, 0):
        return False
    print("Solution exists: Following are the assigned colors:")
    for i in range(len(graph)):
        print(f"Node {i}: Color {color[i]}")
    return True

if __name__ == "__main__":
    graph = {
        0: [1, 2],
        1: [0, 2, 3],
        2: [0, 1, 3],
        3: [1, 2]
    }
    m = 3
    graph_coloring(graph, m)


```

Python 3.8.2 Shell

```

File Edit Shell Debug Options Window Help
Python 3.8.2 (taqsa/v3.8.2:7b3ab59, Feb 25 2020, 23:03:10) [MSC v.1916 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> RESTART: C:/Users/ashri/16.py
Solution exists: Following are the assigned colors:
Node 0: Color 1
Node 1: Color 2
Node 2: Color 3
Node 3: Color 1
>>>

```

Ln: 1 Col: 16

16.py - C:/Users/ashri/16.py (3.8.2)

```

File Edit Format Run Options Window Help
board = [' ' for _ in range(9)]

def print_board():
    print("\n")
    for i in range(3):
        print(f" {board[i*3]} | {board[i*3+1]} | {board[i*3+2]} ")
        if i < 2:
            print(" ---|---|---")
    print("\n")

def check_winner(player):
    win_conditions = [
        [0, 1, 2], [3, 4, 5], [6, 7, 8],
        [0, 3, 6], [1, 4, 7], [2, 5, 8],
        [0, 4, 8], [2, 4, 6]
    ]
    for condition in win_conditions:
        if all(board[i] == player for i in condition):
            return True
    return False

def check_tie():
    return ' ' not in board

def play_game():
    current_player = 'X'
    while True:
        print_board()
        try:
            move = int(input(f"Player {current_player}, choose a position (1-9): ")) - 1
            if board[move] == ' ':
                board[move] = current_player
                if check_winner(current_player):
                    print_board()
                    print(f"Player {current_player} wins!")
                    break
                if check_tie():
                    print_board()
                    print("It's a tie!")
                    break
                current_player = 'O' if current_player == 'X' else 'X'
            else:
                print("That spot is already taken.")
        except (ValueError, IndexError):
            print("Invalid input. Please choose a number between 1 and 9.")

if __name__ == "__main__":
    play_game()


```

Python 3.8.2 Shell

```

File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 23:03:10) [MSC v.1916 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> ----- RESTART: C:/Users/ashri/16.py -----

```

16.py - C:/Users/ashri/16.py (3.8.2)

```
File Edit Format Run Options Window Help
from collections import deque

def bfs(graph, start):
    visited = set()
    queue = deque([start])
    visited.add(start)

    while queue:
        node = queue.popleft()
        print(node, end=" ")
        for neighbor in graph.get(node, []):
            if neighbor not in visited:
                visited.add(neighbor)
                queue.append(neighbor)

graph = {
    0: [1, 3],
    1: [0, 2, 3],
    2: [4, 1, 5],
    3: [4, 0, 1],
    4: [2, 3, 5],
    5: [4, 2],
    6: [1]
}

print("BFS traversal starting from node 0:")
bfs(graph, 0)
```

Python 3.8.2 Shell

```
File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 23:03:10) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> ===== RESTART: C:/Users/ashri/16.py =====
BFS Traversal starting from node 0:
0 1 3 2 4 5
>>>
```

Ln: 7 Col: 4

Hot days ahead
32°C

Search

13:56
12-08-2025

16.py - C:/Users/ashri/16.py (3.8.2)

File Edit Format Run Options Window Help

```

import math

def entropy(labels):
    counts = {}
    for lbl in labels:
        counts[lbl] = counts.get(lbl, 0) + 1
    total = len(labels)
    return -sum((count/total) * math.log2(count/total) for count in counts.values())

def split(X, y, feature, threshold):
    leftX, leftY, rightX, rightY = [], [], [], []
    for xi, yi in zip(X, y):
        if xi[feature] <= threshold:
            leftX.append(xi); leftY.append(yi)
        else:
            rightX.append(xi); rightY.append(yi)
    return leftX, leftY, rightX, rightY

def best_split(X, y):
    base_entropy = entropy(y)
    best_gain, best_feat, best_thr = 0, None, None
    n_features = len(X[0])
    for feature in range(n_features):
        thresholds = set(x[feature] for x in X)
        for thr in thresholds:
            lx, ly, rx, ry = split(X, y, feature, thr)
            if not lx or not rx:
                continue
            p = len(lx) / len(X)
            gain = base_entropy - (p * entropy(ly) + (1 - p) * entropy(ry))
            if gain > best_gain:
                best_gain, best_feat, best_thr = gain, feature, thr
    return best_feat, best_thr

def build_tree(X, y):
    if len(set(y)) == 1:
        return y[0]
    feature, thr = best_split(X, y)
    if feature is None:
        return max(set(y), key=y.count)
    leftX, leftY, rightX, rightY = split(X, y, feature, thr)
    return {
        'feature': feature,
        'threshold': thr,
        'left': build_tree(leftX, leftY),
        'right': build_tree(rightX, rightY)
    }

def predict(tree, x):
    if not isinstance(tree, dict):
        return tree
    if x[tree['feature']] <= tree['threshold']:
        return predict(tree['left'], x)
    return predict(tree['right'], x)

8 NIFTY -0.21% 14:56
Search ENG IN 12-08-2025

```

Python 3.8.2 Shell

File Edit Shell Debug Options Window Help

Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 23:03:10) [MSC v.1916 64 bit (AM x64)] on win32

Type "help", "copyright", "credits" or "license()" for more information.

>>>

===== RESTART: C:/Users/ashri/16.py =====

Tree: {'feature': 0, 'threshold': 3, 'left': 'A', 'right': 'B'}

Predictions: ['A', 'A', 'A', 'B', 'B']

>>> |

Ln: 7 Col: 4

Ln: 57 Col: 26

16.py - C:/Users/ashri/16.py (3.8.2)

```

File Edit Format Run Options Window Help
import math
import random

def sigmoid(x):
    return 1 / (1 + math.exp(-x))

def dsigmoid(x):
    return x * (1 - x)

class SimpleNN:
    def __init__(self):
        random.seed(42)
        self.w1 = [[random.random() for _ in range(2)] for _ in range(2)]
        self.b1 = [0.0, 0.0]
        self.w2 = [random.random(), random.random()]
        self.b2 = 0.0
        self.lr = 0.5

    def forward(self, X):
        self.h = [sigmoid(X[0]*self.w1[0][i] + X[1]*self.w1[1][i] + self.b1[i]) for i in range(2)]
        out = sigmoid(self.h[0]*self.w2[0] + self.h[1]*self.w2[1] + self.b2)
        return out

    def train(self, X, y, epochs=10000):
        for _ in range(epochs):
            for xi, yi in zip(X, y):
                output = self.forward(xi)
                err = yi - output
                d_output = err * dsigmoid(output)
                d_h0 = d_output * self.w2[0] * dsigmoid(self.h[0])
                d_h1 = d_output * self.w2[1] * dsigmoid(self.h[1])
                self.w2[0] += self.lr * d_output * self.h[0]
                self.w2[1] -= self.lr * d_output * self.h[1]
                self.b2 += self.lr * d_output
                self.w1[0][0] += self.lr * d_h0 * xi[0]
                self.w1[1][0] -= self.lr * d_h0 * xi[1]
                self.b1[0] += self.lr * d_h0
                self.w1[0][1] += self.lr * d_h1 * xi[0]
                self.w1[1][1] -= self.lr * d_h1 * xi[1]
                self.b1[1] += self.lr * d_h1

    def predict(self, X):
        return round(self.forward(X))

if __name__ == "__main__":
    X = [[0,0], [0,1], [1,0], [1,1]]
    y = [0, 1, 1, 0]

    nn = SimpleNN()
    nn.train(X, y, epochs=5000)
    print([nn.predict(xi) for xi in X])

```

Python 3.8.2 Shell

```

File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 23:03:10) [MSC v.1916 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> -----
>>> [0, 1, 1, 0]
>>> |

```

Ln: 6 Col: 4

9 32°C Light rain

Search

15:03
12-08-2025

The screenshot shows the AI ex-28.pl Prolog IDE. The menu bar includes File, Edit, Browse, Compile, Prolog, Pce, Help, and a logo icon. The title bar says AI ex-28.pl. The code area contains the following Prolog predicates:

```
student('Alice', 'Mr. Rao', 'Maths', m101).
student('Bob', 'Mrs. Sharma', 'Physics', p102).
student('Charlie', 'Mr. Rao', 'Maths', m101).
student('David', 'Ms. Priya', 'Chemistry', c103).
student('Eva', 'Mrs. Sharma', 'Physics', p102).

teacher_of(Student, Teacher) :- student(Student, Teacher, _, _).

subject_code(Student, Code) :- student(Student, _, _, Code).

students_of_teacher(Teacher, Student) :- student(Student, Teacher, _, _).
```

The bottom status bar indicates the file path as c:/users/hasini/onedrive/documents/ai ex-28.pl compiled and the line number as Line: 1.

 SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)
File Edit Settings Run Debug Help
Welcome to SWI-Prolog (threaded, 64 bits, version 8.4.3)
SWI-Prolog comes with ABSOLUTELY NO WARRANTY. This is free software.
Please run ?- license. for legal details.

For online help and background, visit <https://www.swi-prolog.org>
For built-in help, use ?- help(Topic). or ?- apropos(Word).

?- % c:/users/hasini/onedrive/documents/ai ex-28 compiled 0.00 sec. -2 clauses
?- ?- teacher_of('Bob', Teacher).
ERROR: Unknown procedure: (?-)/1
ERROR: ?- is the Prolog prompt
ERROR: See FAQ at <https://www.swi-prolog.org/FAQ/ToplevelMode.txt>
ERROR: In:
ERROR: [9] throw(error(existence_error(procedure,..),_2718))
ERROR: [6] correct_goal('(<garbage_collected>',user,'<garbage_collected>'),_2754) at c:/program files/swipl/bootstrap/dwim.pl:92
ERROR:
ERROR: Note: some frames are missing due to last-call optimization.
ERROR: Re-run your program in debug mode (:- debug.) to get more detail.
?- teacher_of('Bob', Teacher).
Teacher = 'Mrs. Sharma'.

?-

The screenshot shows a Windows desktop environment with two open windows. On the left is a window titled "AI ex-31.pl [modified]" containing Prolog code. On the right is a terminal window titled "SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)" showing the execution of the code.

AI ex-31.pl [modified]

File Edit Browse Compile Prolog Pce Help

AI ex-31.pl [modified]

```
can_fly(sparrow).  
can_fly(parrot).  
  
cannot_fly(penguin).  
cannot_fly(ostrich).
```

Colourising buffer ... done, 0.00 seconds, 4 fragments

Line: 1

SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)

File Edit Settings Run Debug Help

Welcome to SWI-Prolog (threaded, 64 bits, version 8.4.3)
SWI-Prolog comes with ABSOLUTELY NO WARRANTY. This is free software.
Please run ?- license. for legal details.

For online help and background, visit <https://www.swi-prolog.org>
For built-in help, use ?- help(Topic). or ?- apropos(Word).

```
?- % c:/users/hasini/onedrive/documents/ai ex-31 compiled 0.00 sec, -2 clauses  
?- can_fly(sparrow).  
true.  
?-
```

02:52 PM 12-08-2025

The image shows a Windows desktop environment with two open windows. On the left is a code editor window titled "AI ex-30.pl" containing Prolog code. On the right is a terminal window titled "SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)" showing the output of running the code.

AI ex-30.pl (Code Editor)

```
% Base case: Move 1 disk directly from From to To
move(1, From, To, _) :-  
    write('Move the top disk from '), write(From),  
    write(' to '), write(to), nl.  
  
% Recursive case: Move N disks
move(N, From, To, Aux) :-  
    N > 1,  
    M is N - 1,  
    move(M, From, Aux, To),  
    move(1, From, To, _),  
    move(M, Aux, To, From).
```

SWI-Prolog (Terminal)

```
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For online help and background, visit https://www.swi-prolog.org  
For built-in help, use ?- help(Topic). or ?- apropos(Word).  
  
?-  
% c:/users/hasini/onedrive/documents/ai ex-30 compiled 0.00 sec. -2 clauses  
?- move(3, left, right, center).  
Move the top disk from left to right  
Move the top disk from left to center  
Move the top disk from right to center  
Move the top disk from left to right  
Move the top disk from center to left  
Move the top disk from center to right  
Move the top disk from left to right  
true
```

At the bottom of the screen, the taskbar shows the path "c:/users/hasini/onedrive/documents/ai ex-30.pl compiled" and the line number "Line: 1". The system tray indicates the date and time as "12-08-2025 02:14 PM".

AI ex-29.pl

File Edit Browse Compile Prolog Pce Help

AI ex-29.pl

```
% Facts: planet(Name, DistanceFromSun_million_km, Moons)
planet(mercury, 58, 0).
planet(venus, 108, 0).
planet(earth, 150, 1).
planet(mars, 228, 2).
planet(jupiter, 778, 95).
planet(saturn, 1430, 83).
planet(uranus, 2870, 27).
planet(neptune, 4500, 14).

% Rule: find planets with more than N moons
more_moons_than(Name, N) :-
    planet(Name, _, Moons),
    Moons > N.
```

c:/users/hasini/onedrive/documents/ai ex-29.pl compiled Line: 1

SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)

File Edit Settings Run Debug Help

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For online help and background, visit <https://www.swi-prolog.org>
For built-in help, use ?- help(Topic). or ?- apropos(Word).

```
?-
% c:/users/hasini/onedrive/documents/ai ex-29 compiled 0.00 sec. -2 clauses
?- more_moons_than(Name, 5).
Name = jupiter ;
Name = saturn ;
Name = uranus ;
Name = neptune.
```

?- █

Line: 1

Ai ex-26.pl SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)

File Edit Settings Run Debug Help

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For online help and background, visit <https://www.swi-prolog.org>
For built-in help, use ?- help(Topic). or ?- apropos(Word).

?-
% c:/users/hasini/onedrive/documents/ai ex-26 compiled 0.00 sec. -2 clauses
?- sum(5, Result).
Result = 15

Line: 2

c:/users/hasini/onedrive/documents/ai ex-26.pl compiled

Show hidden icons

02:42 PM 12-08-2025

The image shows a Windows desktop environment with two open windows. On the left is a window titled "AI ex-27.pl" which contains Prolog code. On the right is a window titled "SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)" which shows the execution of that code.

AI ex-27.pl (Left Window)

```
File Edit Browse Compile Prolog Pce Help  
AI ex-27.pl |  
  
dob('Alice', 12, may, 2000).  
dob('Bob', 5, july, 1999).  
dob('Charlie', 22, march, 2001).  
dob('David', 9, december, 1998).  
dob('Eva', 14, august, 2002).  
  
find_dob(Name, Day, Month, Year) :-  
    dob(Name, Day, Month, Year).
```

c:/users/hasini/onedrive/documents/ai ex-27.pl compiled Line: 8

SWI-Prolog (Right Window)

```
File Edit Settings Run Debug Help  
Welcome to SWI-Prolog (threaded, 64 bits, version 8.4.3)  
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Please run ?- license. for legal details.  
  
For online help and background, visit https://www.swi-prolog.org  
For built-in help, use ?- help(Topic). or ?- apropos(Word).  
?- % c:/users/hasini/onedrive/documents/ai ex-27 compiled 0.00 sec. -2 clauses  
?- find_dob('Alice', Day, Month, year).  
false.  
?- find_dob('Alice', Day, Month, Year).  
Day = 12,  
Month = may,  
Year = 2000.  
?-
```

02:39 PM 12-08-2025