#Array implementation

class LibraryStack:

def \_\_init\_\_(self):

self.stack = []

def push(self, book):

self.stack.append(book)

print(f'Book "{book}" added to the library stack.')

def pop(self):

if not self.is\_empty():

removed\_book = self.stack.pop()

print(f'Book "{removed\_book}" removed from the library stack.')

return removed\_book

else:

print("The library stack is empty. No book to remove.")

return None

def peek(self):

if not self.is\_empty():

print(f'Top book in the library stack: "{self.stack[-1]}"')

return self.stack[-1]

else:

print("The library stack is empty.")

return None

def is\_empty(self):

return len(self.stack) == 0

def display(self):

if self.is\_empty():

print("The library stack is empty.")

else:

print("Books in the library stack (top to bottom):")

for book in reversed(self.stack):

print(f' - {book}')

library = LibraryStack()

while True:

print("\nLibrary Stack Operations:")

print("1. Add Book (Push)")

print("2. Remove Book (Pop)")

print("3. View Top Book (Peek)")

print("4. Display All Books")

print("5. Exit")

choice = input("Enter your choice (1-5): ")

if choice == '1':

book\_name = input("Enter the book title to add: ")

library.push(book\_name)

elif choice == '2':

library.pop()

elif choice == '3':

library.peek()

elif choice == '4':

library.display()

elif choice == '5':

print("Exiting the program. Goodbye!")

break

else:

print("Invalid choice! Please enter a number between 1 and 5.")

OUTPUT:

Library Stack Operations:

1. Add Book (Push)

2. Remove Book (Pop)

3. View Top Book (Peek)

4. Display All Books

5. Exit

Enter your choice (1-5): 1

Enter the book title to add: dishes

Book "dishes" added to the library stack.

Library Stack Operations:

1. Add Book (Push)

2. Remove Book (Pop)

3. View Top Book (Peek)

4. Display All Books

5. Exit

Enter your choice (1-5): 1

Enter the book title to add: computer

Book "computer" added to the library stack.

Library Stack Operations:

1. Add Book (Push)

2. Remove Book (Pop)

3. View Top Book (Peek)

4. Display All Books

5. Exit

Enter your choice (1-5): 3

Top book in the library stack: "computer"

Library Stack Operations:

1. Add Book (Push)

2. Remove Book (Pop)

3. View Top Book (Peek)

4. Display All Books

5. Exit

Enter your choice (1-5): 4

Books in the library stack (top to bottom):

- computer

- dishes

Library Stack Operations:

1. Add Book (Push)

2. Remove Book (Pop)

3. View Top Book (Peek)

4. Display All Books

5. Exit

Enter your choice (1-5): 2

Book "computer" removed from the library stack.

Library Stack Operations:

1. Add Book (Push)

2. Remove Book (Pop)

3. View Top Book (Peek)

4. Display All Books

5. Exit

Enter your choice (1-5): 5

Exiting the program. Goodbye!

#LinkedList implementation

class Node:

def \_\_init\_\_(self, book\_title):

self.book\_title = book\_title

self.next = None

class BookStack:

def \_\_init\_\_(self):

self.top = None

def push(self, book\_title):

new\_node = Node(book\_title)

new\_node.next = self.top

self.top = new\_node

print(f'Book "{book\_title}" added to the stack.')

def pop(self):

if self.top is None:

print("Stack is empty! No book to remove.")

return None

removed\_book = self.top.book\_title

self.top = self.top.next

print(f'Book "{removed\_book}" removed from the stack.')

return removed\_book

def peek(self):

if self.top is None:

print("Stack is empty! No book to show.")

return None

print(f'Top book is "{self.top.book\_title}".')

return self.top.book\_title

def is\_empty(self):

return self.top is None

def display(self):

current = self.top

if current is None:

print("Stack is empty.")

return

print("Books in stack (top to bottom):")

while current:

print(f'- {current.book\_title}')

current = current.next

def main():

stack = BookStack()

while True:

print("\nLibrary Book Stack Menu:")

print("1. Add Book (Push)")

print("2. Remove Book (Pop)")

print("3. Show Top Book (Peek)")

print("4. Display All Books")

print("5. Exit")

choice = input("Enter your choice (1-5): ")

if choice == '1':

book\_title = input("Enter book title to add: ")

stack.push(book\_title)

elif choice == '2':

stack.pop()

elif choice == '3':

stack.peek()

elif choice == '4':

stack.display()

elif choice == '5':

print("Exiting program. Goodbye!")

break

else:

print("Invalid choice, please try again.")

if \_\_name\_\_ == "\_\_main\_\_":

main()

OUTPUT:

Library Book Stack Menu:

1. Add Book (Push)

2. Remove Book (Pop)

3. Show Top Book (Peek)

4. Display All Books

5. Exit

Enter your choice (1-5): 1

Enter book title to add: computer languages

Book "computer languages" added to the stack.

Library Book Stack Menu:

1. Add Book (Push)

2. Remove Book (Pop)

3. Show Top Book (Peek)

4. Display All Books

5. Exit

Enter your choice (1-5): 1

Enter book title to add: data structures

Book "data structures" added to the stack.

Library Book Stack Menu:

1. Add Book (Push)

2. Remove Book (Pop)

3. Show Top Book (Peek)

4. Display All Books

5. Exit

Enter your choice (1-5): 3

Top book is "data structures".

Library Book Stack Menu:

1. Add Book (Push)

2. Remove Book (Pop)

3. Show Top Book (Peek)

4. Display All Books

5. Exit

Enter your choice (1-5): 4

Books in stack (top to bottom):

- data structures

- computer languages

Library Book Stack Menu:

1. Add Book (Push)

2. Remove Book (Pop)

3. Show Top Book (Peek)

4. Display All Books

5. Exit

Enter your choice (1-5): 2

Book "data structures" removed from the stack.

Library Book Stack Menu:

1. Add Book (Push)

2. Remove Book (Pop)

3. Show Top Book (Peek)

4. Display All Books

5. Exit

Enter your choice (1-5): 5

Exiting program. Goodbye!