

Function for Linear Search

```
def linear_search(arr, x):  
    for i in range(len(arr)):  
        if arr[i] == x:  
            return i  
    return -1
```

Function for Sentinel Search

```
def sentinel_search(arr, x):  
    n = len(arr)  
    last = arr[n - 1]  
    arr[n - 1] = x  
    i = 0  
    while arr[i] != x:  
        i += 1  
    arr[n - 1] = last  
    if i < n - 1 or arr[n - 1] == x:  
        return i  
    return -1
```

Function for Binary Search

```
def binary_search(arr, x):  
    left, right = 0, len(arr) - 1  
    while left <= right:  
        mid = (left + right) // 2  
        if arr[mid] == x:  
            return mid  
        elif arr[mid] < x:  
            left = mid + 1  
        else:  
            right = mid - 1  
    return -1
```

```
# Function for Fibonacci Search
```

```
def fibonacci_search(arr, x):
```

```
    fib2 = 0
```

```
    fib1 = 1
```

```
    fibM = fib2 + fib1
```

```
    n = len(arr)
```

```
    while fibM < n:
```

```
        fib2 = fib1
```

```
        fib1 = fibM
```

```
        fibM = fib2 + fib1
```

```
    offset = -1
```

```
    while fibM > 1:
```

```
        i = min(offset + fib2, n - 1)
```

```
        if arr[i] < x:
```

```
            fibM = fib1
```

```
            fib1 = fib2
```

```
            fib2 = fibM - fib1
```

```
            offset = i
```

```
        elif arr[i] > x:
```

```
            fibM = fib2
```

```
            fib1 = fib1 - fib2
```

```
            fib2 = fibM - fib1
```

```
        else:
```

```
            return i
```

```
    if fib1 and arr[offset + 1] == x:
```

```
        return offset + 1
```

```
    return -1
```

```
def main():
```

```
    while True:
```

```
        print("\nChoose a search algorithm:")
```

```
print("1. Linear Search")
print("2. Sentinel Search")
print("3. Binary Search")
print("4. Fibonacci Search")
print("5. Exit")
```

```
choice = int(input("Enter choice: "))
```

```
if choice in [1, 2, 3, 4]:
    arr = list(map(int, input("Enter a list of integers (space-separated): ").split()))
    x = int(input("Enter the value to search: "))
```

```
if choice == 1:
    print("Linear Search: Element found at index", linear_search(arr, x))
```

```
elif choice == 2:
    print("Sentinel Search: Element found at index", sentinel_search(arr, x))
```

```
elif choice == 3:
    print("Binary Search: Element found at index", binary_search(arr, x))
```

```
elif choice == 4:
    print("Fibonacci Search: Element found at index", fibonacci_search(arr, x))
```

```
elif choice == 5:
    break
```

```
else:
    print("Invalid choice. Please try again.")
```

```
if __name__ == "__main__":
    main()
```