



DATA STRUCTURES

Assignment 1
Sir. Muhammad Adil

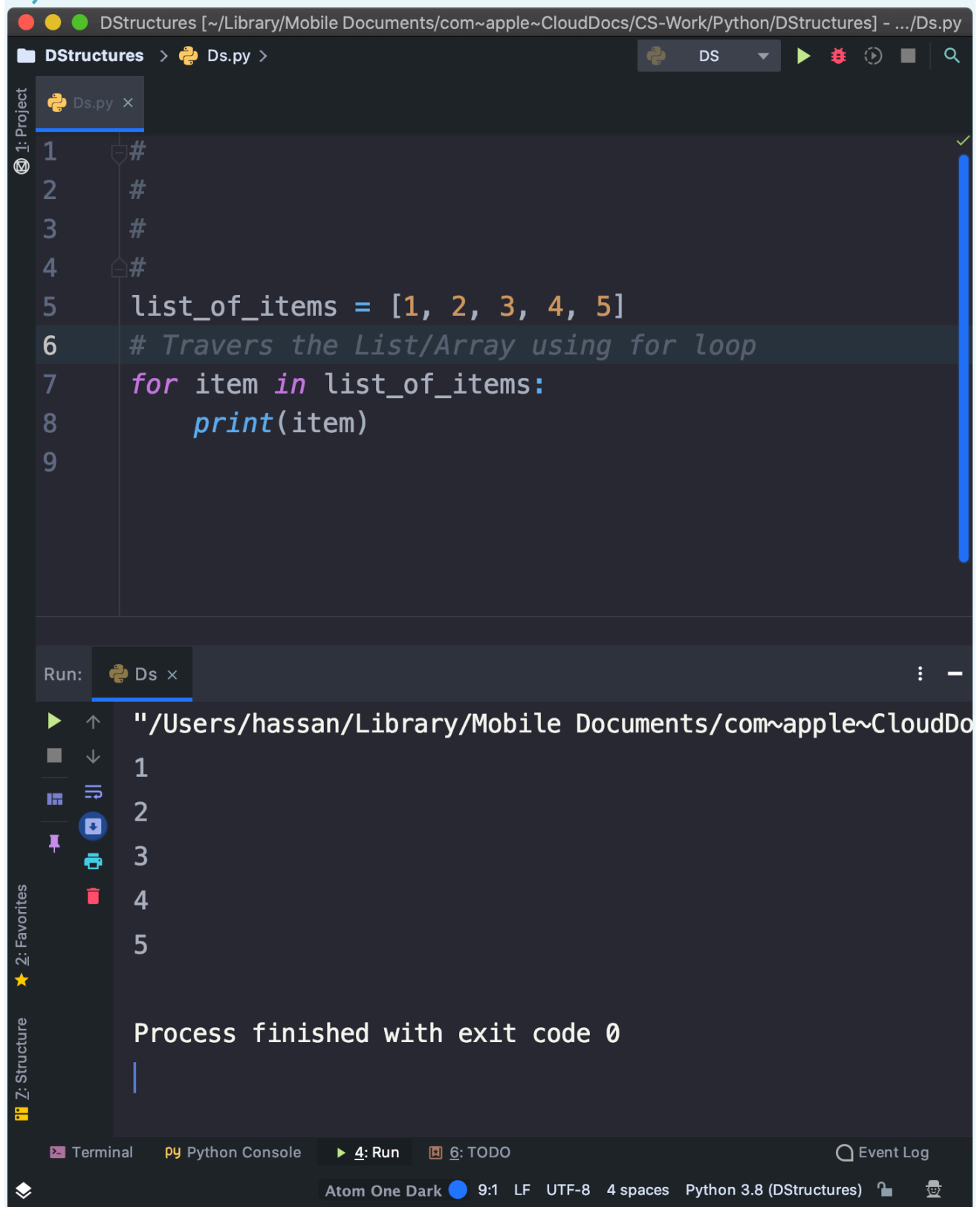


HASSAN MEHDI

15453
Python

#1: Design a Program (in any Computer Language of your choice) to implement the Algorithms to:

A) TRAVERS AN ARRAY USING FOR LOOP:



```
1 #
2 #
3 #
4 #
5 list_of_items = [1, 2, 3, 4, 5]
6 # Travers the List/Array using for loop
7 for item in list_of_items:
8     print(item)
9
```

Run: Ds x

```
"/Users/hassan/Library/Mobile Documents/com~apple~CloudDo
1
2
3
4
5

Process finished with exit code 0
```

Terminal Python Console 4: Run 6: TODO Event Log

Atom One Dark 9:1 LF UTF-8 4 spaces Python 3.8 (DStructures)

B) TRAVERSE AN ARRAY USING WHILE LOOP:

```
1 #
2 #
3 #
4 #
5 list_of_items = [1, 2, 3, 4, 5]
6 location = 0
7 # Traverse the list/Array using while loop
8 while location < list_of_items.__len__():
9
10     print(list_of_items[location])
11     location = location + 1
12
```

while location < list_of_items...

Run: Ds x

```
"/Users/hassan/Library/Mobile Documents/com~apple~CloudDo
1
2
3
4
5

Process finished with exit code 0
```

Terminal Python Console 4: Run 6: TODO Event Log

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C) INSERT AN ELEMENT IN AN ARRAY:

The screenshot shows an IDE window titled "DStructures" with a file named "Ds.py". The code in the editor is as follows:

```
1 #
2 #
3 #
4 #
5 list_of_items = [1, 2, 3, 4, 5]
6 print(list_of_items)
7
8 # Insert an element
9 list_of_items.append(6)
10 print(list_of_items)
11
12
```

Below the editor, the "Run" output is displayed:

```
"/Users/hassan/Library/Mobile Documents/com~apple~CloudDo
[1, 2, 3, 4, 5]
[1, 2, 3, 4, 5, 6]
Process finished with exit code 0
```

The IDE interface includes a sidebar with "Project" and "Favorites" sections, and a bottom status bar showing "Atom One Dark", "7:1", "LF", "UTF-8", "4 spaces", and "Python 3.8 (DStructures)".

D) DELETE AN ELEMENT FROM AN ARRAY:

The screenshot shows an IDE window with a Python file named `Ds.py`. The code defines a list `list_of_items` with values `[1, 2, 3, 4, 5]`, prints it, then uses `list_of_items.remove(5)` to delete the element `5`, and prints the list again. The output shows the list changing from `[1, 2, 3, 4, 5]` to `[1, 2, 3, 4]`. The process finishes with exit code 0.

```
1 #
2 #
3 #
4 #
5 list_of_items = [1, 2, 3, 4, 5]
6 print(list_of_items)
7 # Delete an element from an List/Array
8 list_of_items.remove(5)
9 print(list_of_items)
10
```

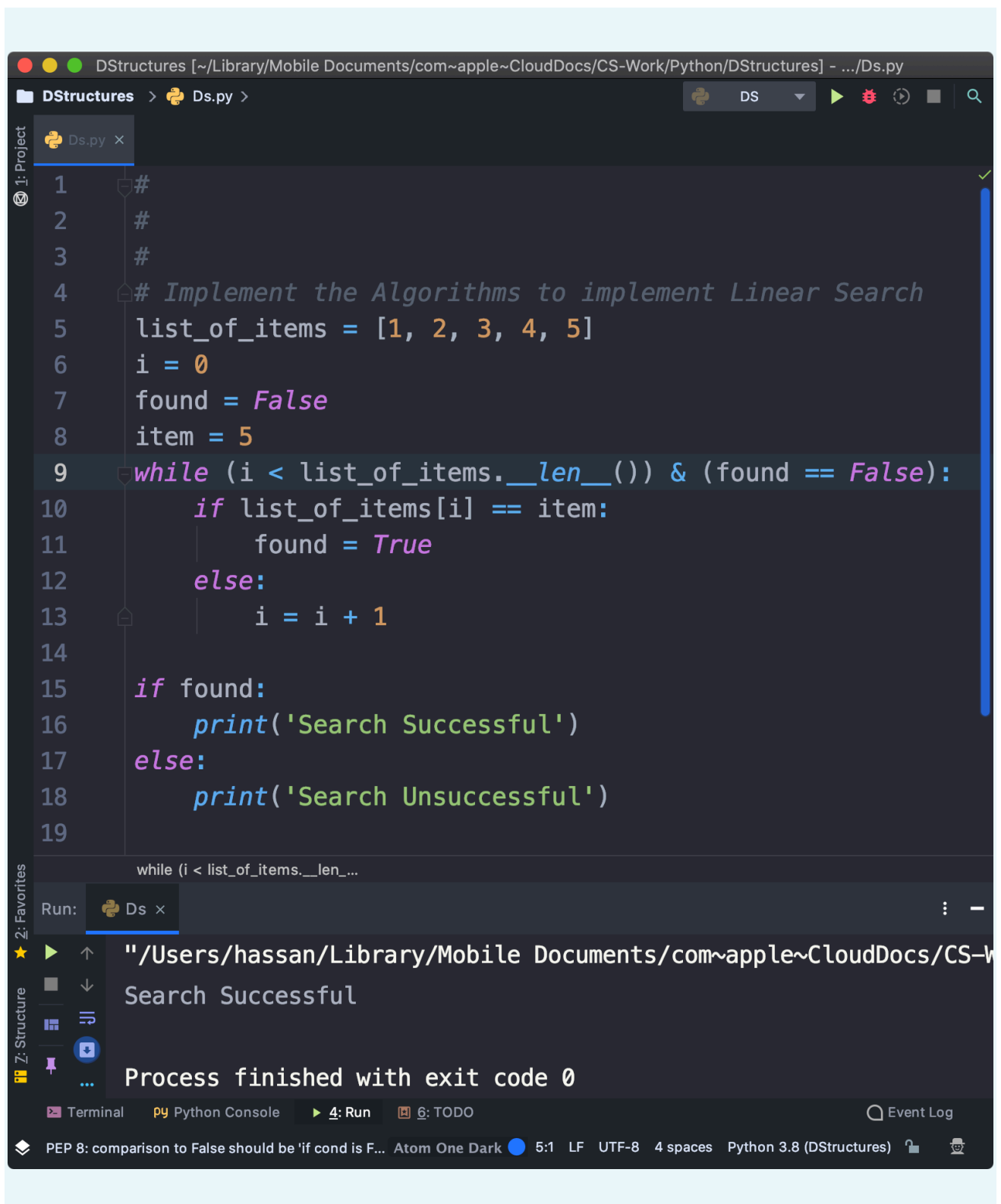
Run: Ds x

```
"/Users/hassan/Library/Mobile Documents/com~apple~CloudDo
[1, 2, 3, 4, 5]
[1, 2, 3, 4]
Process finished with exit code 0
```

Terminal Python Console 4: Run 6: TODO Event Log

Atom One Dark 6:1 LF UTF-8 4 spaces Python 3.8 (DStructures)

#2: Design a Program (in any Computer Language of your choice) to implement the Algorithms to implement Linear Search:



```
1 #
2 #
3 #
4 # Implement the Algorithms to implement Linear Search
5 list_of_items = [1, 2, 3, 4, 5]
6 i = 0
7 found = False
8 item = 5
9 while (i < list_of_items.__len__()) & (found == False):
10     if list_of_items[i] == item:
11         found = True
12     else:
13         i = i + 1
14
15 if found:
16     print('Search Successful')
17 else:
18     print('Search Unsuccessful')
19
```

while (i < list_of_items.__len__...

Run: Ds x

"/Users/hassan/Library/Mobile Documents/com~apple~CloudDocs/CS-w
Search Successful

Process finished with exit code 0

Terminal Python Console 4: Run 6: TODO Event Log

PEP 8: comparison to False should be 'if cond is F... Atom One Dark 5:1 LF UTF-8 4 spaces Python 3.8 (DStructures)

#3: Design a Program (in any Computer Language of your choice) to implement the Algorithms to implement Binary Search.

```
4 # Implement the Algorithms to implement Binary Search
5 list_of_items = [1, 2, 3, 4, 5, 6, 7, 8, 9]
6 lb = 0
7 ub = len(list_of_items)
8 found = False
9 item = 5
10 while (lb < ub) & (found == False):
11     mid = int((lb + ub)/2)
12     if item == list_of_items[mid]:
13         found = True
14     elif item < list_of_items[mid]:
15         ub = mid - 1
16     else:
17         ub = mid + 1
18
19 if found:
20     print('Search Successful')
21 else:
22     print('Search Unsuccessful')
```

Run: Ds x

```
"/Users/hassan/Library/Mobile Documents/com~apple~CloudDocs/CS-W
Search Successful

Process finished with exit code 0
```

Atom One Dark 5:1 LF UTF-8 4 spaces Python 3.8 (DStructures)

