Data Structures

Spring-2020

Data Structures and Algorithms

Sessional Assignment

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Task# 1

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

- Travers an Array using for loop
- Traverse an Array using while loop
- Insert an element in an Array
- Delete an element from an Array

Code along with the output screenshot should be submitted.

SOLUTION:

01) Travers an Array using for loop :

IN-PUT:

```
list = ["Yasir", "Irfan", "Bilal", "Hassan", "Wasif"]
# Using for loop
for i in list:
    print(i)
```

OUT-PUT

C:\Users\salal\PycharmProjects\assing\venv\Scripts\python.exe
C:/Users/salal/PycharmProjects/assing/assing.py

Yasir

Irfan

Bilal

Hassan

Wasif

Process finished with exit code 0

02) Traverse an Array using while loop :

IN-PUT

```
a = ["university", "national", "iqra"]
while a:
      print(a.pop(-1))
```

OUT-PUT

C:\Users\salal\PycharmProjects\assing\venv\Scripts\python.exe
C:/Users/salal/PycharmProjects/assing/assing.py

iqra

national

university

Process finished with exit code 0

03) Insert an element in an Array :

IN-PUT:

```
list = ["Iqra", "University"]

list.insert(1 , National')

print(Updated List: ', list)
```

OUT-PUT

```
C:\Users\salal\PycharmProjects\assing\venv\Scripts\python.exe
C:/Users/salal/PycharmProjects/assing/assing.py
```

Updated List: ['Iqra', 'National', 'University']

```
Process finished with exit code 0
```

04) Delete an element from an Array :

IN-PUT:

```
l = list(range(10))
del l[2:8:2]
print(l)
# [0, 1, 3, 5, 7, 8, 9]

l = list(range(10))
del l[::3]
print(l)
```

OUT-PUT:

```
C:\Users\salal\PycharmProjects\assing\venv\Scripts\python.exe
C:/Users/salal/PycharmProjects/assing/assing.py
```

[0, 1, 3, 5, 7, 8, 9]

[1, 2, 4, 5, 7, 8]

```
Process finished with exit code 0
```

Task# 2

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

Code along with the output screenshot should be submitted.

SOLUTION:

IN-PUT:

```
def linear_search(M, y):
    for element in M:
        if element == y:
            return y is found'
    return y is not found'
M = [3, 5, 11, 6, 9, 23, 12, 13, 4]
y = 12
print(linear_search(M , y))
```

OUT-PUT

```
C:\Users\salal\PycharmProjects\assing\venv\Scripts\python.exe
C:/Users/salal/PycharmProjects/assing/assing.py
y is found

Process finished with exit code 0
```

Task# 3

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

Code along with the output screenshot should be submitted.

SOLUTION:

IN-PUT:

```
items = [5, 7, 10, 12, 15]

print("list of items is", items)

x = int(input("enter item to search:"))

i = flag = 0

while i < len(items) :
    if items[i] == x :
        flag = 1
        break

    i = i + 1

if flag == 1 :
    print("item found at position:", i + 1)
else :
    print("item not found")
```

OUT-PUT

```
C:\Users\salal\PycharmProjects\assing\venv\Scripts\python.exe
C:/Users/salal/PycharmProjects/assing/assing.py
list of items is [5, 7, 10, 12, 15]
enter item to search: 5
item found at position: 1
Process finished with exit code 0
```