Lets upgrade

Assignment 5

Name:- Apurv Aglawe

Email:- itsmyidapurv@gmail.com

Question 1

Name 5 sorting algorithms, also write their time complexities (best, average, worst).

Solution:-

1) Selection sort :- The selection sort algorithm sorts an array by repeatedly finding the minimum element from unsorted part and swapping it at the position of the comparison element in ascending order.
   Best = O(n^2)
   Average = O(n^2)
   Worst = O(n^2)
2) Quick sort:-
   Best = O(n * logn)
   Average = O(n * logn)
   Worst = O(n^2
3) Merge sort :-
   Best :- O(n log(n))
   Average:- O(n log(n))
   Worst:-O(n log(n))
4) Bubble sort:-
   Best :- O(n)
   Average:- O(n^2)
   Worst:-O(n^2)
5) Insertion sort:-
   Best :- O(n)
   Average:- O(n^2)
   Worst:-O(n^2)

Question 2

Implement selection sort algorithm using Python.

Solution:-

```
l = [int(i) for i in input().split()]
print(l)
for j in range(1,len(l)):
    key = l[j]
    i = j-1
    while i>=0 and l[i]>key:
        l[i+1] = l[i]
        i = i-1
```

```
    l[i+1] = key
print(l)
```

Question 3

Implement pop operation of the stack.

Solution:-

```
# Push element in the list
def push(x):
    global l,top,size
    if top == size - 1:
        print("overflow")
        return
    top += 1
    l.insert(top , x)
# displays the list in decnding order
def display():
    print( l[ : : -1 ] )
# pops the last entered element in the list. If the list is empty it returns from the function and prints
#‘Underflow’
def pop_top():
    global top
    if top < 0:
        print("underflow")
        return
    print(top)
    l.remove(l[top])
    top -= 1

l = list()
top = -1
size = 5
# push 10,20,30 in the list
push(10)
push(20)
push(30)
# display the list
display()
pop_top() # removes 30 from the list
display()
pop_top() # removes 20 from the list
display()
pop_top() # removes 10 from the list
display()
pop_top() # “prints underflow”
```

Question 4

Implement dequeue operation of the queue

Solution:-

```
l = [int(i) for i in input('Enter the elements: ').split()]
# dequeue function to remove the last element of the queue
def dequeue():
```

```
    if not l:
        print("Underflow")
    else:
        m = l.pop(-1)
        print("\nremoved element",m)
# function to display the elements
def display():
    for j in range(0,len(l)):
        print(l[j],end=" ")


dequeue() # removes last element from the list
display() # displays elements of the list
```