

```
import random
```

```
class Node:
```

```
    def __init__(self, value, level):  
        self.value=value  
        self.forward=[None]*(level+1)
```

```
class SkipList:
```

```
    def __init__(self,max_level=3):  
        self.max_level=max_level  
        self.header=self.create_node(float('-inf'),max_level)
```

```
    def create_node(self,value,level):  
        new_node=Node(value,level)  
        return new_node
```

```
    def random_level(self):  
        level=0  
        while random.random()<0.5 and level<self.max_level:  
            level+=1  
        return level
```

```
    def insert(self,value):  
        update=[None]*(self.max_level+1)  
        current=self.header  
        for i in range(self.max_level,-1,-1):  
            #print("i in for ",i)  
            while current.forward[i] and current.forward[i].value<value:  
                current=current.forward[i]  
            #print("i in while ",current.forward[i])  
        update[i]=current
```

```
level=self.random_level()
```

```
print(level)
```

```
if level>self.max_level:
```

```
    level=self.max_level
```

```
new_node=self.create_node(value,level)
```

```
for i in range(level+1):
```

```
    new_node.forward[i]=update[i].forward[i]
```

```
    update[i].forward[i]=new_node
```

```
    skip_list.display()
```

```
def display(self):
```

```
    for level in range(self.max_level,-1,-1):
```

```
        node=self.header.forward[level]
```

```
        while node:
```

```
            print(f"{node.value} ->",end="")
```

```
            node=node.forward[level]
```

```
        print("None")
```

```
    print("\n")
```

```
skip_list=SkipList(max_level=3)
```

```
def main():
```

```
    while(True):
```

```
        print("\n1.PRESS 1 FOR INSERTING")
```

```
        print("2.PRESS 2 FOR DISPLAY")
```

```
        print("3.PRESS 3 FOR EXIT")
```

```
        CH=int(input("\nENTER YOUR CHOICE :- "))
```

```
        if CH==1:
```

```
            no=int(input("\nENTER NO YOU WANT TO INSERT :- "))
```

```
            skip_list.insert(no)
```

```
            ans=str(input("\nDO YOU WANT TO CONTINUE :- "))
```

```
    if(ans=='y' or ans=='Y'):
        main()
    else:
        break
elif CH==2:
    skip_list.display()
    ans=str(input("\nDO YOU WANT TO CONTINUE :- "))
    if(ans=='y' or ans=='Y'):
        main()
    else:
        break
elif CH==3:
    print("\nSUCCESSFULLY EXIT")
    break
else:
    print("\nENTER CORRECT CHOICE ")
    main()
main()
```