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Batch C22

AIM: Perform Amortized Analysis of Multipop / Dynamic Tables / Binary Counter using Aggregate, Accounting and Potential method. (Amortized Analysis)

1A) Amortized Analysis (Aggregate method)

CODE:

```
class AggregateStack:
    def __init__(self):
        self.stack=[]
        self.cost=0
    def push(self,item):
        self.stack.append(item)
        self.cost+=1
        self.printstack()
        print("\tCost: ",self.cost)
    def pop(self):
        self.stack.pop()
        self.cost+=1
        self.printstack()
        print("\tCost: ",self.cost)

    def multipop(self,k):
        for i in range(k):
            self.pop()

    def printstack(self):
        print(self.stack,end='')
s=AggregateStack()
s.push(10)
s.push(10)
s.push(10)
s.push(10)
s.multipop(2)

print("\n_____________________________")

def aggregate_dynamic(n):
    size=1
```

```
    icost=0
    dcost=0
    totalcost=0
    total=0

    print("Element\tDoubling Cost\tInsertion cost\tTotal cost")
    for i in range(1,n+1):
        icost=1
        if i > size:
            size*=2
            dcost=i-1
        totalcost=dcost+icost
        total=total+totalcost
        print(i,"\t\t",dcost,"\t\t",icost,"\t\t",totalcost,"")
        icost=0
        dcost=0
    return total/n

n=int(input("Enter the number of elemnets: "))
print("Aggregate method")
a=aggregate_dynamic(n)
print("Amortized cost= ",a)
```

OUTPUT:

```
PS C:\Users\Jadhav\Documents\BTech\Docs\6th Sem\AA\Code> & C:/msys64/mingw64/bin/python.exe "c:/Users/Jadhav/Doc
uments/BTech/Docs/6th Sem/AA/Code/Aggregate.py"
[10]    Cost:  1
[10, 10]        Cost:  2
[10, 10, 10]    Cost:  3
[10, 10, 10, 10]        Cost:  4
[10, 10, 10]    Cost:  5
[10, 10]        Cost:  6


_______________________________
Enter the number of elemnets: 6
Aggregate method
Element Doubling Cost   Insertion cost  Total cost
1               0               1               1
2               1               1               2
3               2               1               3
4               0               1               1
5               4               1               5
6               0               1               1
Amortized cost=  2.1666666666666665
PS C:\Users\Jadhav\Documents\BTech\Docs\6th Sem\AA\Code>
```