LAB-7

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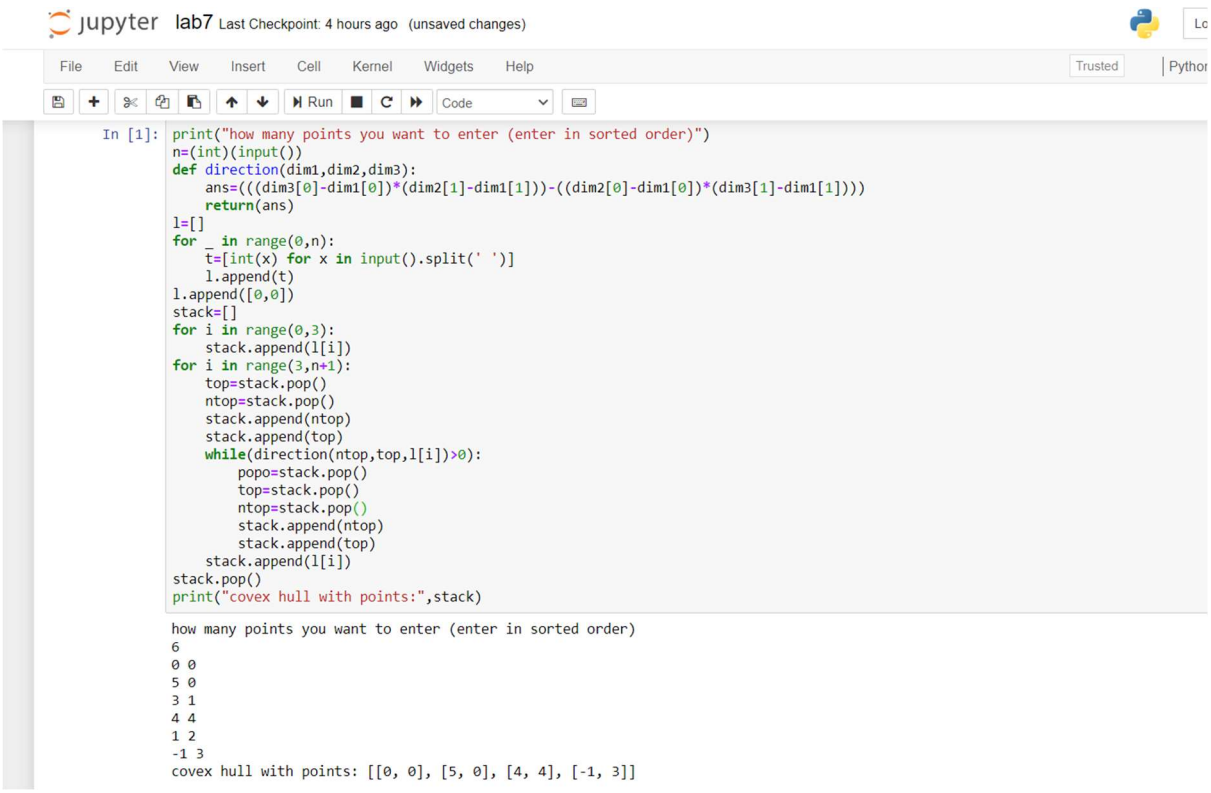
- **Convex Hull using Graham scan:**

```
print("how many points you want to enter (enter in sorted order)")
n=(int)(input())
def direction(dim1,dim2,dim3):
   ans=(((dim3[0]-dim1[0])*(dim2[1]-dim1[1]))-((dim2[0]-
dim1[0])*(dim3[1]-dim1[1])))
   return(ans)
l=[]
for _ in range(0,n):
   t=[int(x) for x in input().split(' ')]
   l.append(t)
l.append([0,0])
stack=[]
for i in range(0,3):
   stack.append(l[i])
for i in range(3,n+1):
   top=stack.pop()
   ntop=stack.pop()
   stack.append(ntop)
   stack.append(top)
   while(direction(ntop,top,l[i])>0):
      popo=stack.pop()
      top=stack.pop()
      ntop=stack.pop()
      stack.append(ntop)
      stack.append(top)
   stack.append(l[i])
stack.pop()
print("covex hull with points:",stack)
```

snapshot:



Conclusion:

Running time: o(n logn)