```
import pandas as pd
import numpy as np


data = pd.read_csv('adult.csv')
df = pd.DataFrame(data)
df
```

	age	workclass	fnlwgt	education	education.num	marital.status	occupation	relationship	race	sex	capital.gain	capital.l
0	90	?	77053	HS-grad	9	Widowed	?	Not-in-family	White	Female	0	4
1	82	Private	132870	HS-grad	9	Widowed	Exec-managerial	Not-in-family	White	Female	0	4
2	66	?	186061	Some-college	10	Widowed	?	Unmarried	Black	Female	0	4
3	54	Private	140359	7th-8th	4	Divorced	Machine-op-inspct	Unmarried	White	Female	0	3
4	41	Private	264663	Some-college	10	Separated	Prof-specialty	Own-child	White	Female	0	3
...	...	...	...	...	...	...	...	...	...	...	...	
32556	22	Private	310152	Some-college	10	Never-married	Protective-serv	Not-in-family	White	Male	0	
32557	27	Private	257302	Assoc-acdm	12	Married-civ-spouse	Tech-support	Wife	White	Female	0	
32558	40	Private	154374	HS-grad	9	Married-civ-spouse	Machine-op-inspct	Husband	White	Male	0	
32559	58	Private	151910	HS-grad	9	Widowed	Adm-clerical	Unmarried	White	Female	0	
32560	22	Private	201490	HS-grad	9	Never-married	Adm-clerical	Own-child	White	Male	0	

```
df1 = df[['age','education.num']].copy()
df1
```

	age	education.num
0	90	9
1	82	9
2	66	10
3	54	4
4	41	10
...	...	...
32556	22	10
32557	27	12
32558	40	9
32559	58	9
32560	22	9

32561 rows × 2 columns

```
x = df1['age']
x_mean = x.mean()
print(x)
print(x_mean)
```

```
0        90
1        82
2        66
3        54
4        41
        ..
32556    22
32557    27
```

```
32558    40
32559    58
32560    22
Name: age, Length: 32561, dtype: int64
38.58164675532078
```

```
y = df1['education.num']
y_mean = y.mean()
print(y)
print(y_mean)
```

```
0         9
1         9
2        10
3         4
4        10
         ..
32556    10
32557    12
32558     9
32559     9
32560     9
Name: education.num, Length: 32561, dtype: int64
10.0806793403151
```

```
l = list()
for i in x:
  l.append(i-x_mean)
```

```
k = list()
for j in y:
  k.append(j-y_mean)
```

```
sum =0
for t in range(len(l)):
  sum+=(l[t]*k[t])
```

```
cov = sum/(len(l)-1)
cov
```

```
-26.683919874034615
```

Start coding or generate with AI.