Data Science amb Python

Estudiant: Cristiane de Souza da Silva

Lliurament tasca 6: Visualització gràfica d'un dataset

- **Exercici 1**

Resumeix gràficament el data set DelayedFlights.csv

Crea almenys una visualització per:

- Una variable categòrica (UniqueCarrier)
- Una variable numèrica (ArrDelay)
- Una variable numèrica i una categòrica (ArrDelay i UniqueCarrier)
- Dues variables numèriques (ArrDelay i DepDelay)
- Tres variables (ArrDelay, DepDelay i UniqueCarrier)
- Més de tres variables (ArrDelay, DepDelay, AirTime i UniqueCarrier).

In [1]:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:

```
flights= pd.read_csv('DelayedFlights.csv')
flights.head()
```

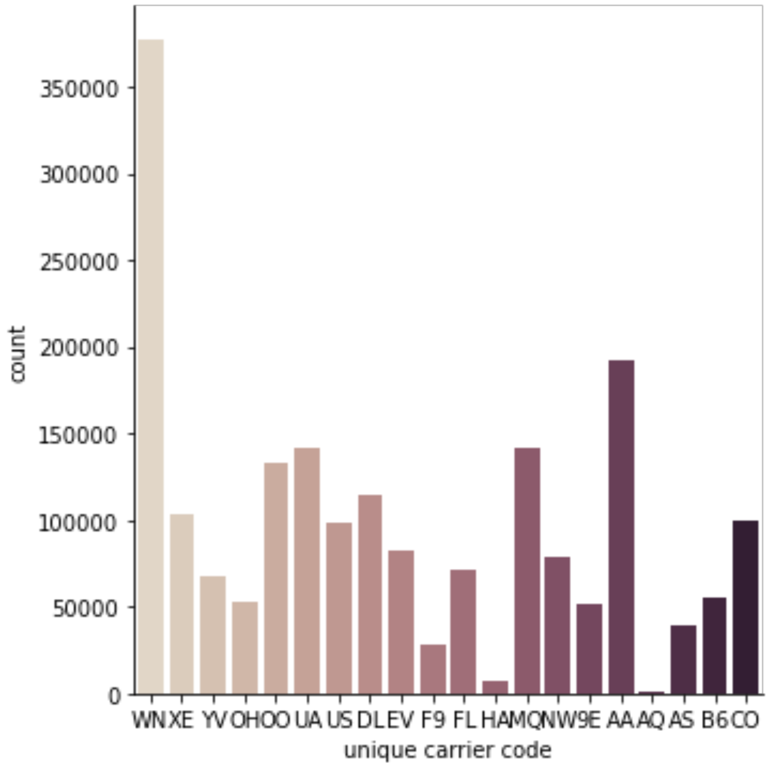
Out[2]:

	Unnamed: 0	Year	Month	DayofMonth	DayOfWeek	DepTime	CRSDepTime	ArrTime	CR
0	0	2008	1	3	4	2003.0	1955	2211.0	
1	1	2008	1	3	4	754.0	735	1002.0	
2	2	2008	1	3	4	628.0	620	804.0	
3	4	2008	1	3	4	1829.0	1755	1959.0	
4	5	2008	1	3	4	1940.0	1915	2121.0	

5 rows × 30 columns

In [3]:

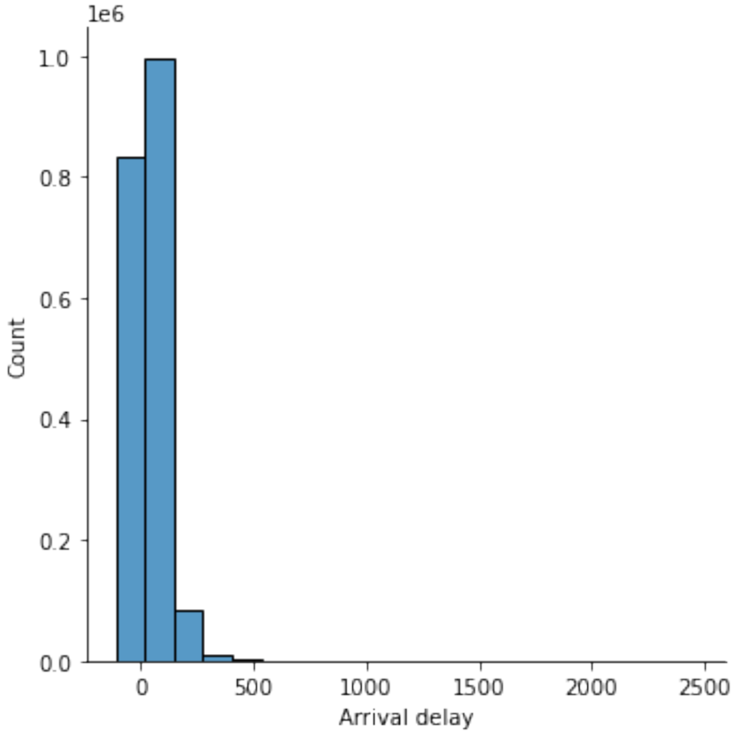
```
# A categorical variable (UniqueCarrier)
#plt.figure(figsize=(15,8))
sns.catplot(x="UniqueCarrier", kind="count", palette="ch:.25", data=flights
plt.xlabel("unique carrier code")
plt.savefig('code_catplot.png')
plt.show()
```



In [4]:

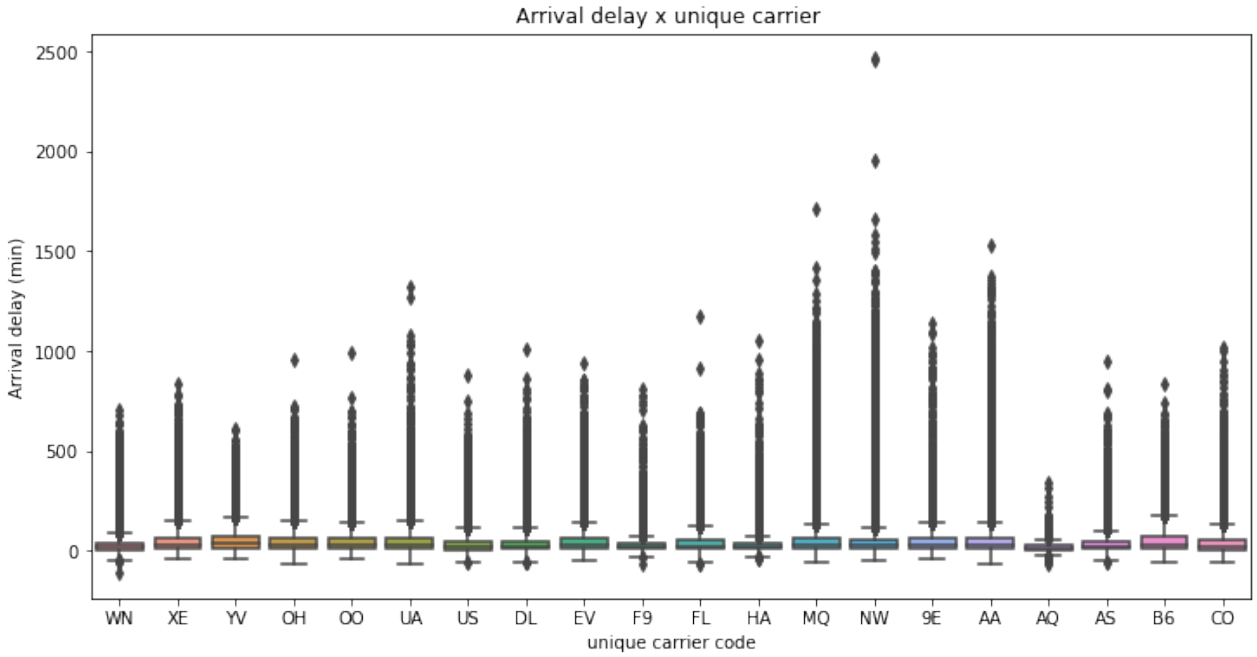
```
#A numeric variable (ArrDelay)

figsize=(12,8)
sns.displot(flights, x="ArrDelay", bins=20)
plt.xlabel("Arrival delay")
plt.savefig('arrdelay.png')
plt.show()
```



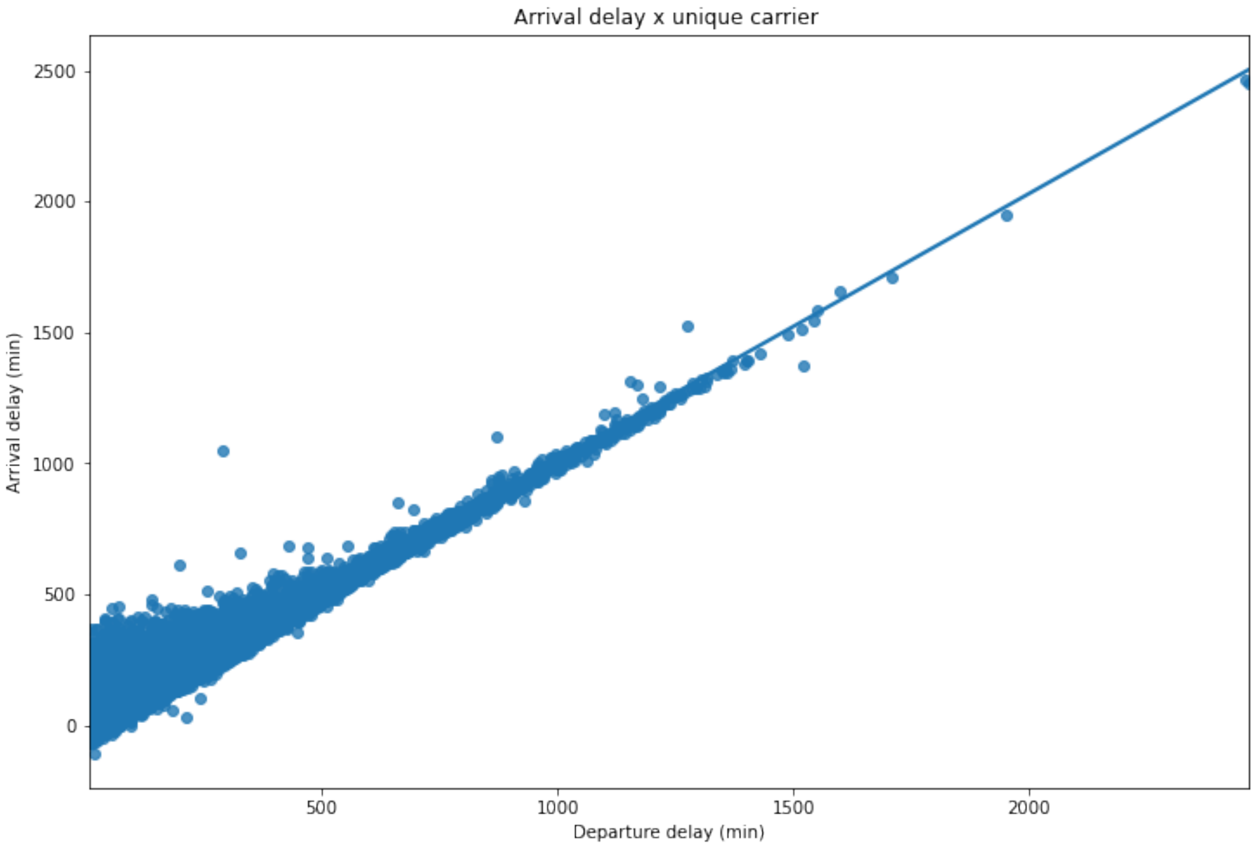
In [5]:

```
#A numeric and a categorical variable (ArrDelay and UniqueCarrier)
plt.figure(figsize=(12,6))
sns.boxplot(x="UniqueCarrier", y='ArrDelay',data=flights)
plt.xlabel("unique carrier code")
plt.ylabel('Arrival delay (min)')
plt.title('Arrival delay x unique carrier ')
plt.savefig('code-arrdelay.png')
plt.show()
```



In [6]:

```
#Two numeric variables (ArrDelay and DepDelay)
plt.figure(figsize=(12,8))
sns.regplot(x="DepDelay", y="ArrDelay", data=flights)
plt.xlabel("Departure delay (min)")
plt.ylabel('Arrival delay (min)')
plt.title('Arrival delay x unique carrier ')
plt.savefig('arrdelay-depdelay.png')
plt.show()
```

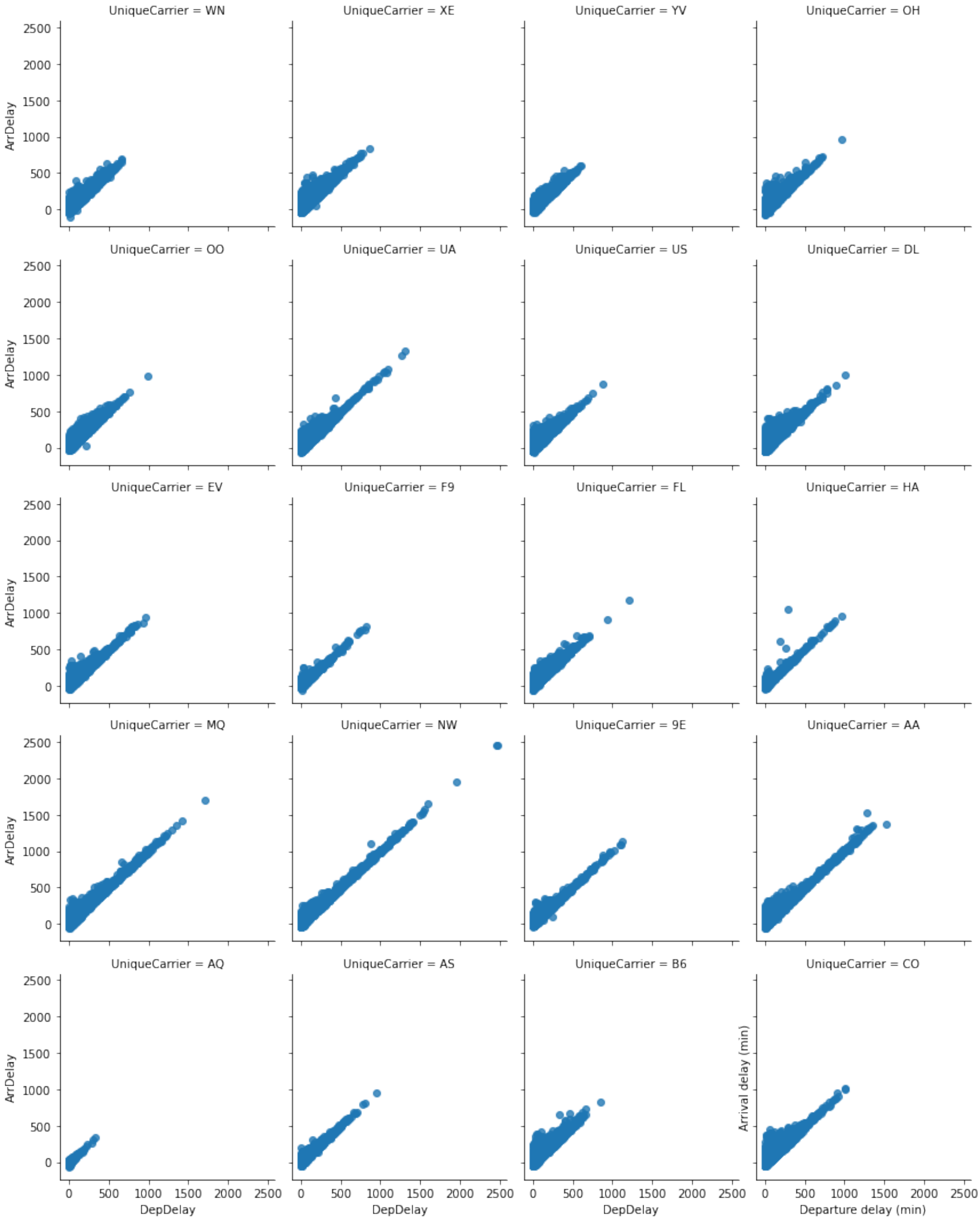


In [7]:

```
#Three variables (ArrDelay, DepDelay and UniqueCarrier)
#plt.figure(figsize=(12,8))

g = sns.FacetGrid(flights, col="UniqueCarrier", col_wrap=4)
g.map(sns.regplot, "DepDelay", "ArrDelay", fit_reg=False, x_jitter=.1)
g.add_legend()


plt.xlabel("Departure delay (min)")
plt.ylabel('Arrival delay (min)')
plt.savefig('code-arr-dep.png')
plt.show()
```



```
In [8]: #More than three variables (ArrDelay, DepDelay, AirTime and UniqueCarrier)
        four_variables = flights[['ArrDelay', 'DepDelay', 'AirTime' , 'UniqueCarrie
        four_variables.head()
```

Out[8]:

	ArrDelay	DepDelay	AirTime	UniqueCarrier
0	-14.0	8.0	116.0	WN
1	2.0	19.0	113.0	WN
2	14.0	8.0	76.0	WN
3	34.0	34.0	77.0	WN
4	11.0	25.0	87.0	WN

In [ ]:

In [9]:

```
arrdelay_mean = four_variables.groupby(['UniqueCarrier'])['ArrDelay'].mean
arrdelay_mean = arrdelay_mean.astype(int)
arrdelay_mean
```

Out[9]:

```
UniqueCarrier
9E    46
AA    46
AQ    21
AS    36
B6    55
CO    40
DL    39
EV    47
F9    27
FL    43
HA    34
MQ    45
NW    43
OH    51
OO    45
UA    47
US    36
WN    30
XE    50
YV    55
Name: ArrDelay, dtype: int64
```

In [10]:

```
DepDelay_mean = four_variables.groupby(['UniqueCarrier'])['DepDelay'].mean
DepDelay_mean = DepDelay_mean.astype(int)
DepDelay_mean
```

```
Out[10]: UniqueCarrier
         9E     47
         AA     46
         AQ     26
         AS     38
         B6     55
         CO     43
         DL     39
         EV     48
         F9     27
         FL     42
         HA     33
         MQ     43
         NW     41
         OH     48
         OO     44
         UA     49
         US     38
         WN     34
         XE     50
         YV     55
         Name: DepDelay, dtype: int64
```

```
In [11]: AirTime_mean = four_variables.groupby(['UniqueCarrier'])['AirTime'].mean()
         AirTime_mean = AirTime_mean.astype(int)
         AirTime_mean
```

```
Out[11]: UniqueCarrier
         9E      72
         AA     144
         AQ     114
         AS     129
         B6     150
         CO     165
         DL     132
         EV      72
         F9     122
         FL     104
         HA     113
         MQ      69
         NW     115
         OH      82
         OO      71
         UA     143
         US     132
         WN      93
         XE      90
         YV      65
         Name: AirTime, dtype: int64
```

```
In [12]: average_time_code= pd.concat([DepDelay_mean,AirTime_mean,arrdelay_mean], a
         average_time_code
```

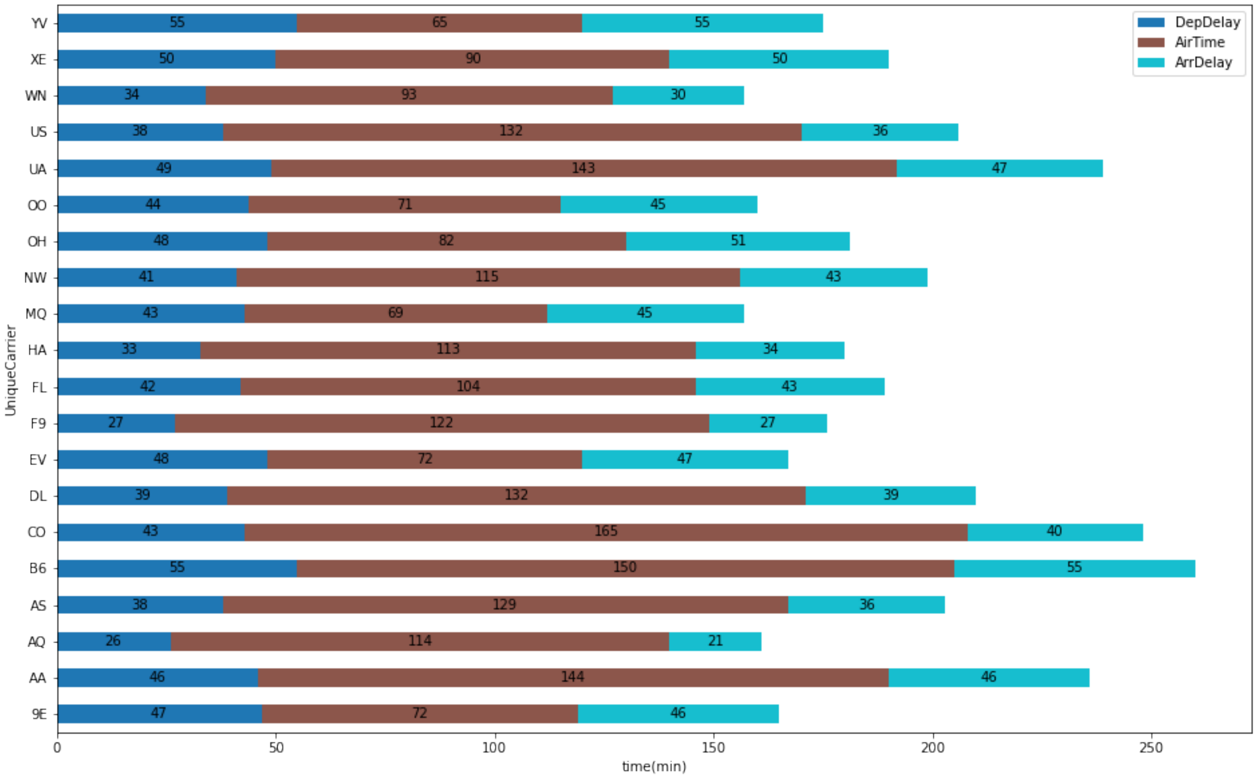
Out[12]:

UniqueCarrier	DepDelay	AirTime	ArrDelay
9E	47	72	46
AA	46	144	46
AQ	26	114	21
AS	38	129	36
B6	55	150	55
CO	43	165	40
DL	39	132	39
EV	48	72	47
F9	27	122	27
FL	42	104	43
HA	33	113	34
MQ	43	69	45
NW	41	115	43
OH	48	82	51
OO	44	71	45
UA	49	143	47
US	38	132	36
WN	34	93	30
XE	50	90	50
YV	55	65	55

In [13]:

```
# plot
ax = average_time_code.plot.barh(stacked=True, cmap='tab10', figsize=(16, 

# annotations:
for p in ax.patches:
    left, bottom, width, height = p.get_bbox().bounds
    if width > 0:
        ax.annotate(f'{width:0.0f}', xy=(left+width/2, bottom+height/2), 
plt.xlabel("time(min)");
plt.savefig('time-code.png')
```



In [ ]:

- **Exercici 2**

Exporta els gràfics com imatges o com html.

- **Exercici 3**

Exporta el data set net i amb les noves columnes a Excel.

In [ ]:

- **Exercici 4**

Integra les visualitzacions gràfiques, en la tasca 5, del Sprint 3.

In [ ]: