Importando base de dados

In [2]:

```
import pandas as pd
```

In [3]:

```
dados = pd.read_csv('tips.csv')
```

In [4]:

```
dados.head()
```

Out[4]:

	total_bill	tip	dessert	day	time	size
0	16.99	1.01	No	Sun	Dinner	2
1	10.34	1.66	No	Sun	Dinner	3
2	21.01	3.50	No	Sun	Dinner	3
3	23.68	3.31	No	Sun	Dinner	2
4	24.59	3.61	No	Sun	Dinner	4

Tradução

In [5]:

```
dados.columns
```

Out[5]:

```
Index(['total_bill', 'tip', 'dessert', 'day', 'time', 'size'], dtype='object')
```

In [6]:

```
renomear = {
          'total_bill':'valor_da_conta',
          'tip':'gorjeta',
          'dessert':'sobremesa',
          'day':'dia_da_semana',
          'time':'hora',
          'size':'pessoas'
}
```

In [7]:

```
gorjetas = dados.rename(columns = renomear)
```

In [8]:

```
gorjetas.sobremesa.unique()
```

Out[8]:

```
array(['No', 'Yes'], dtype=object)
```

In [9]:

```
sim_nao = {'No':'Não', 'Yes':'Sim'}
```

In [10]:

```
gorjetas.sobremesa.map(sim_nao)
```

Out[10]:

```
0      Não
1      Não
2      Não
3      Não
4      Não
      ...
239    Não
240    Sim
241    Sim
242    Não
243    Não
Name: sobremesa, Length: 244, dtype: object
```

In [11]:

```
gorjetas.sobremesa = gorjetas.sobremesa.map(sim_nao)
```

In [12]:

```
gorjetas
```

Out[12]:

	valor_da_conta	gorjeta	sobremesa	dia_da_semana	hora	pessoas
0	16.99	1.01	Não	Sun	Dinner	2
1	10.34	1.66	Não	Sun	Dinner	3
2	21.01	3.50	Não	Sun	Dinner	3
3	23.68	3.31	Não	Sun	Dinner	2
4	24.59	3.61	Não	Sun	Dinner	4
...	...	...	...	...	...	...
239	29.03	5.92	Não	Sat	Dinner	3
240	27.18	2.00	Sim	Sat	Dinner	2
241	22.67	2.00	Sim	Sat	Dinner	2
242	17.82	1.75	Não	Sat	Dinner	2
243	18.78	3.00	Não	Thur	Dinner	2

244 rows × 6 columns

In [13]:

```
gorjetas.dia_da_semana.unique()
```

Out[13]:

```
array(['Sun', 'Sat', 'Thur', 'Fri'], dtype=object)
```

In [14]:

```
dias = {'Sun':'Domingo',
        'Sat':'Sabado',
        'Thur':'Quinta',
        'Fri':'Sexta'}
```

In [15]:

```
gorjetas.dia_da_semana = gorjetas.dia_da_semana.map(dias)
```

In [16]:

```
gorjetas
```

Out[16]:

	valor_da_conta	gorjeta	sobremesa	dia_da_semana	hora	pessoas
0	16.99	1.01	Não	Domingo	Dinner	2
1	10.34	1.66	Não	Domingo	Dinner	3
2	21.01	3.50	Não	Domingo	Dinner	3
3	23.68	3.31	Não	Domingo	Dinner	2
4	24.59	3.61	Não	Domingo	Dinner	4
...	...	...	...	...	...	...
239	29.03	5.92	Não	Sabado	Dinner	3
240	27.18	2.00	Sim	Sabado	Dinner	2
241	22.67	2.00	Sim	Sabado	Dinner	2
242	17.82	1.75	Não	Sabado	Dinner	2
243	18.78	3.00	Não	Quinta	Dinner	2

244 rows × 6 columns

In [17]:

```
gorjetas.hora.unique()
```

Out[17]:

```
array(['Dinner', 'Lunch'], dtype=object)
```

In [18]:

```
hora = {
    'Dinner':'Jantar',
    'Lunch':'Almoço'
}
```

In [19]:

```
gorjetas.hora = gorjetas.hora.map(hora)
```

In [20]:

```
gorjetas
```

Out[20]:

	valor_da_conta	gorjeta	sobremesa	dia_da_semana	hora	pessoas
0	16.99	1.01	Não	Domingo	Jantar	2
1	10.34	1.66	Não	Domingo	Jantar	3
2	21.01	3.50	Não	Domingo	Jantar	3
3	23.68	3.31	Não	Domingo	Jantar	2
4	24.59	3.61	Não	Domingo	Jantar	4
...	...	...	...	...	...	...
239	29.03	5.92	Não	Sabado	Jantar	3
240	27.18	2.00	Sim	Sabado	Jantar	2
241	22.67	2.00	Sim	Sabado	Jantar	2
242	17.82	1.75	Não	Sabado	Jantar	2
243	18.78	3.00	Não	Quinta	Jantar	2

244 rows × 6 columns

Seaborn

In [21]:

```
import seaborn as sns
```

Analise da conta e da gosteja

In [22]:

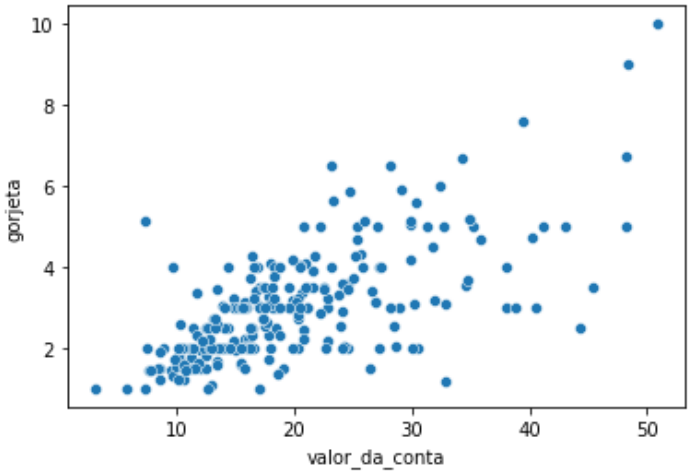
```
gorjetas.columns
```

Out[22]:

```
Index(['valor_da_conta', 'gorjeta', 'sobremesa', 'dia_da_semana', 'hora',
       'pessoas'],
      dtype='object')
```

In [23]:

```
valor_gorjeta = sns.scatterplot(x = 'valor_da_conta',y = "gorjeta", data=gorjetas)
```



Criando campo porcentagem

In [24]:

```
gorjetas['porcentagem'] = gorjetas.gorjeta/gorjetas.valor_da_conta
```

In [25]:

```
gorjetas
```

Out[25]:

	valor_da_conta	gorjeta	sobremesa	dia_da_semana	hora	pessoas	porcentagem
0	16.99	1.01	Não	Domingo	Jantar	2	0.059447
1	10.34	1.66	Não	Domingo	Jantar	3	0.160542
2	21.01	3.50	Não	Domingo	Jantar	3	0.166587
3	23.68	3.31	Não	Domingo	Jantar	2	0.139780
4	24.59	3.61	Não	Domingo	Jantar	4	0.146808
...	...	...	...	...	...	...	...
239	29.03	5.92	Não	Sabado	Jantar	3	0.203927
240	27.18	2.00	Sim	Sabado	Jantar	2	0.073584
241	22.67	2.00	Sim	Sabado	Jantar	2	0.088222

	valor_da_conta	gorjeta	sobremesa	dia_da_semana	hora	pessoas	porcentagem
242	17.82	1.75	Não	Sábado	Jantar	2	0.098204
243	18.78	3.00	Não	Quinta	Jantar	2	0.159744

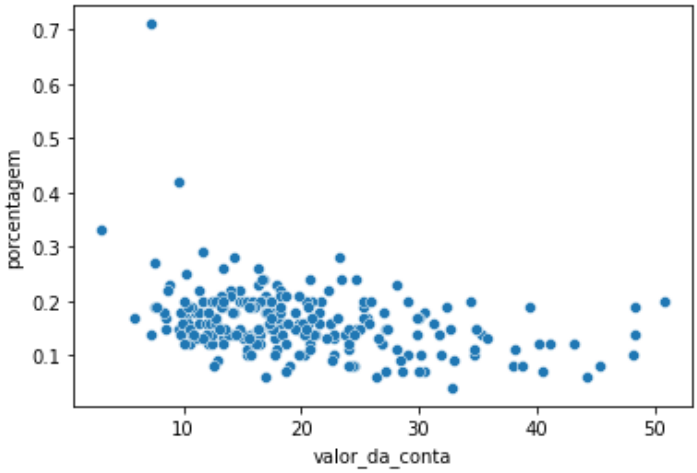
244 rows × 7 columns

In [26]:

```
gorjetas.porcentagem = gorjetas.porcentagem.round(2)
```

In [27]:

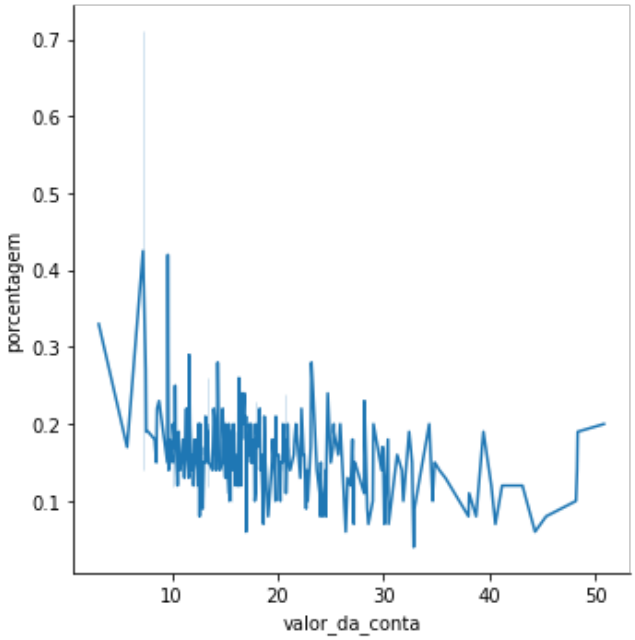
```
porcentagem_conta = sns.scatterplot(x='valor_da_conta',y='porcentagem',data=gorjetas)
```



Visualmente, o valor da gorjeta não é proporcional ao valor da conta

In [28]:

```
porcentagem_conta_linha = sns.relplot(x='valor_da_conta', y='porcentagem',kind='line', d
ata=gorjetas)
```

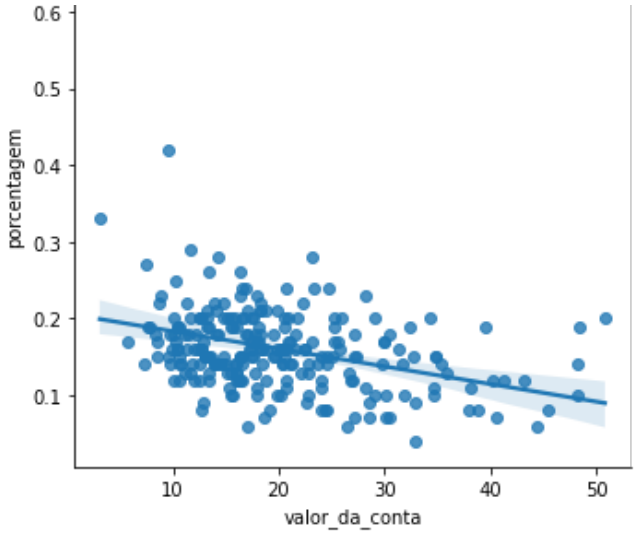


In [29]:

```
sns.lmplot(x='valor_da_conta', y='porcentagem',data=gorjetas)
```

Out[29]:

```
<seaborn.axisgrid.FacetGrid at 0x1d69acb82e0>
```

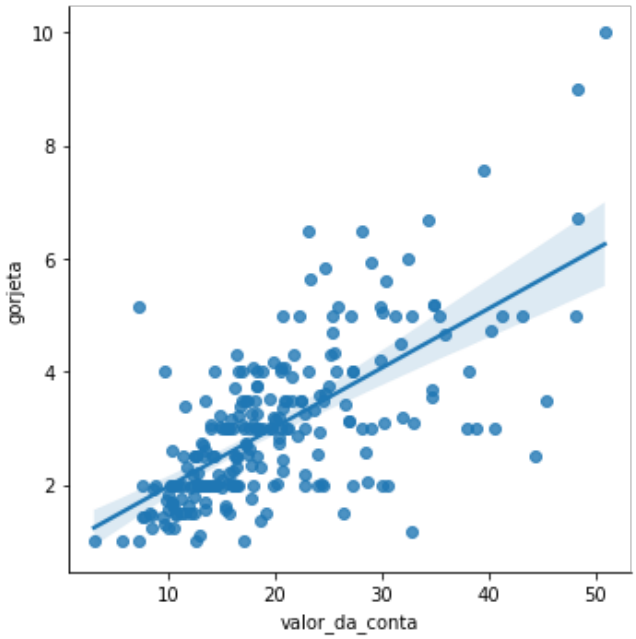


In [30]:

```
sns.lmplot(x='valor_da_conta', y='gorjeta',data=gorjetas)
```

Out[30]:

```
<seaborn.axisgrid.FacetGrid at 0x1d69ac48a30>
```



Análise Sobremesa

In [31]:

```
gorjetas[gorjetas.sobremesa == "Sim"].describe()
```

Out[31]:

	valor_da_conta	gorjeta	pessoas	porcentagem
count	93.000000	93.000000	93.000000	93.000000
mean	20.756344	3.008710	2.408602	0.163226
std	9.832154	1.401468	0.810751	0.085060
min	3.070000	1.000000	1.000000	0.040000
25%	13.420000	2.000000	2.000000	0.110000
50%	17.920000	3.000000	2.000000	0.150000
75%	26.860000	3.680000	3.000000	0.200000
max	50.810000	10.000000	5.000000	0.710000

In [32]:

```
gorjetas[gorjetas.sobremesa == "Não"].describe()
```

Out[32]:

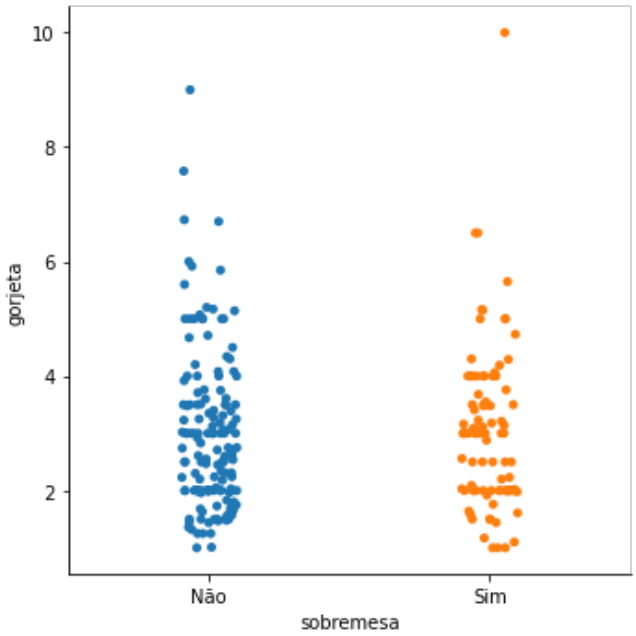
	valor_da_conta	gorjeta	pessoas	porcentagem
count	151.000000	151.000000	151.000000	151.000000
mean	19.188278	2.991854	2.668874	0.159536
std	8.255582	1.377190	1.017984	0.039889
min	7.250000	1.000000	1.000000	0.060000
25%	13.325000	2.000000	2.000000	0.140000
50%	17.590000	2.740000	2.000000	0.160000
75%	22.755000	3.505000	3.000000	0.185000
max	48.330000	9.000000	6.000000	0.290000

In [33]:

```
sns.catplot(x='sobremesa',y='gorjeta',data = gorjetas)
```

Out[33]:

```
<seaborn.axisgrid.FacetGrid at 0x1d69e2a15b0>
```

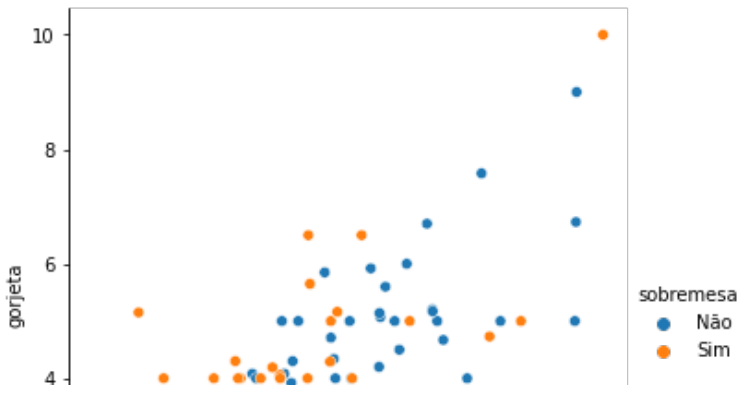


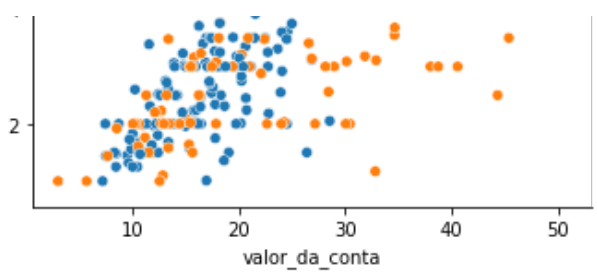
In [34]:

```
sns.relplot(x='valor_da_conta', y='gorjeta',hue='sobremesa',data= gorjetas)
```

Out[34]:

```
<seaborn.axisgrid.FacetGrid at 0x1d69e4378e0>
```



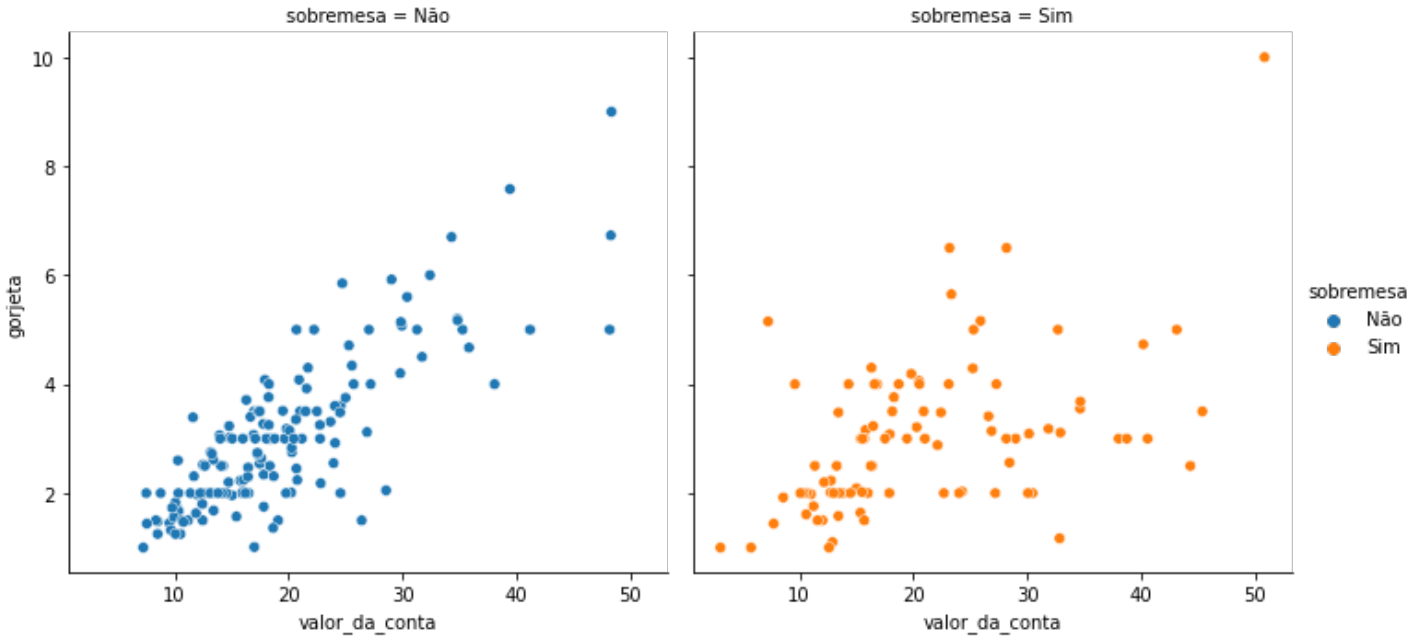


In [35]:

```
sns.relplot(x='valor_da_conta', y='gorjeta',hue='sobremesa',col='sobremesa',data= gorjetas)
```

Out[35]:

```
<seaborn.axisgrid.FacetGrid at 0x1d69e496d00>
```

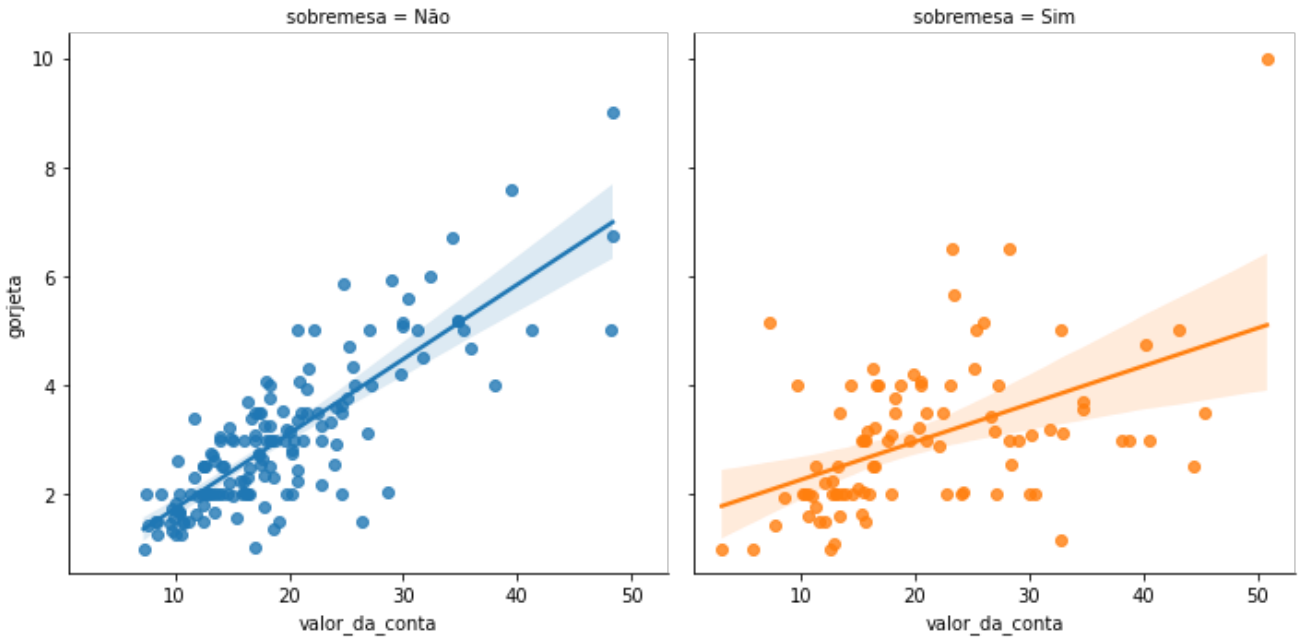


In [36]:

```
sns.lmplot(x='valor_da_conta',y='gorjeta',col='sobremesa',hue='sobremesa',data=gorjetas)
```

Out[36]:

```
<seaborn.axisgrid.FacetGrid at 0x1d69e4fb400>
```



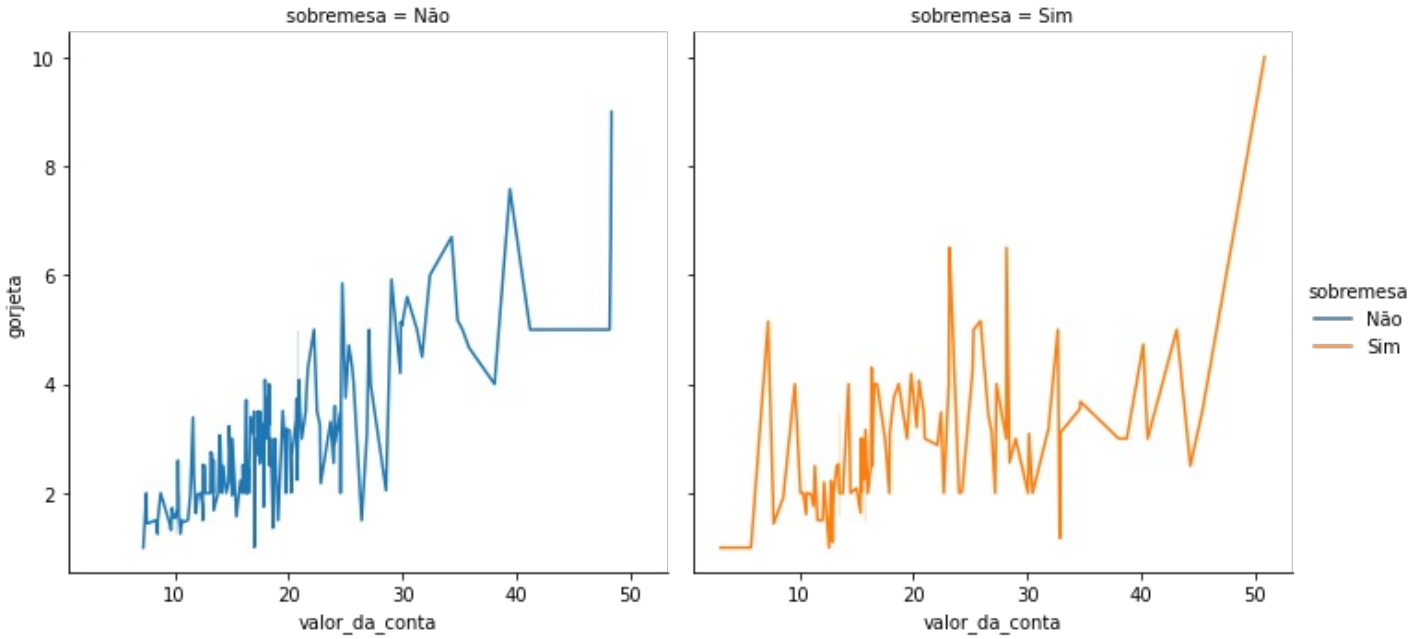
In [37]:

```
sns.relplot(x='valor_da_conta', y='gorjeta',hue='sobremesa',col='sobremesa',kind='line'
```

```
data= gorjetas)
```

Out[37]:

```
<seaborn.axisgrid.FacetGrid at 0x1d69e4f83a0>
```



Teste de hipótese

In [38]:

```
from scipy.stats import ranksums
```

In [39]:

```
sobremesa = gorjetas.query("sobremesa == 'Sim'").porcentagem
```

In [40]:

```
sem_sobremesa = gorjetas.query("sobremesa == 'Não'").porcentagem
```

In [41]:

```
r = ranksums(sobremesa,sem_sobremesa)
```

In [42]:

```
r
```

Out[42]:

```
RanksumsResult(statistic=-0.6331073145314825, pvalue=0.5266635660124415)
```

Análise dia da semana

In [43]:

```
gorjetas.dia_da_semana.unique()
```

Out[43]:

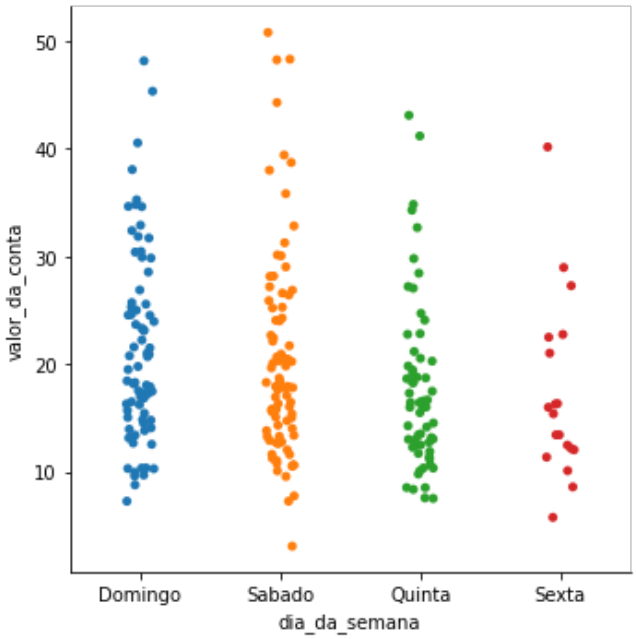
```
array(['Domingo', 'Sabado', 'Quinta', 'Sexta'], dtype=object)
```

In [44]:

```
sns.catplot(x='dia_da_semana',y="valor_da_conta", data=gorjetas)
```

Out[44]:

<seaborn.axisgrid.FacetGrid at 0x1d69f871cd0>

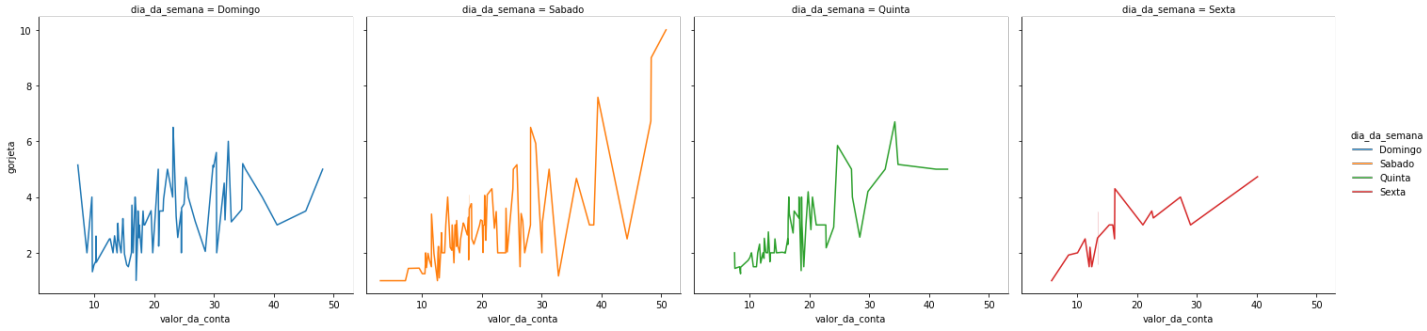


In [47]:

```
sns.relplot(x='valor_da_conta', y="gorjeta",hue="dia_da_semana",kind="line",col="dia_da_semana",data = gorjetas)
```

Out[47]:

<seaborn.axisgrid.FacetGrid at 0x1d69f9a0370>

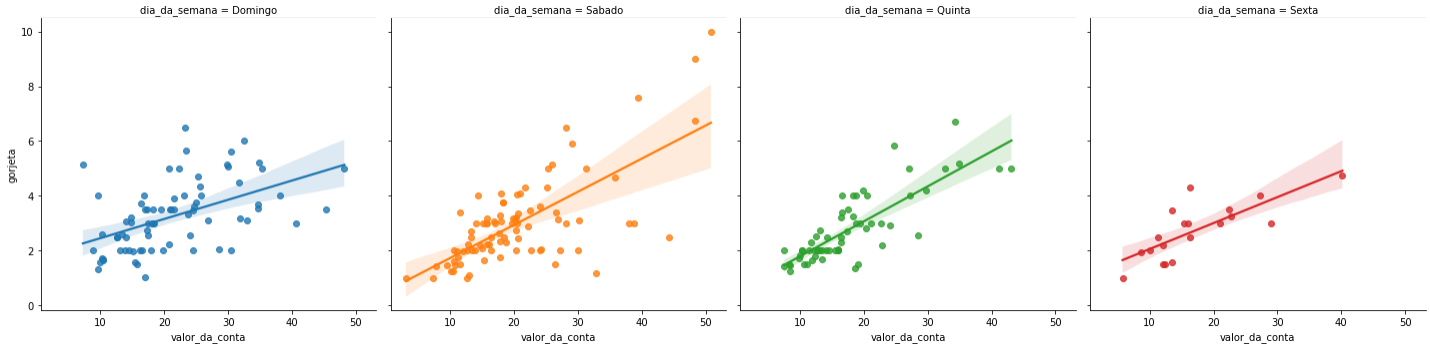


In [49]:

```
sns.lmplot(x='valor_da_conta', y="gorjeta",hue="dia_da_semana",col="dia_da_semana",data = gorjetas)
```

Out[49]:

<seaborn.axisgrid.FacetGrid at 0x1d6a0018910>



Porcentagem

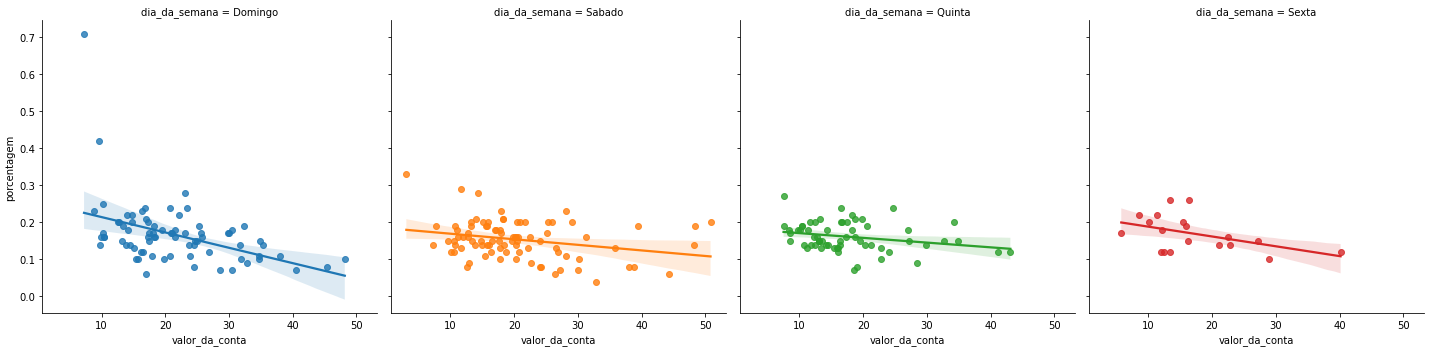
In [52]:

```
sns.lmplot(x='valor_da_conta', y="porcentagem",hue="dia_da_semana",col="dia_da_semana",da
```

```
ta = gorjetas)
```

Out[52]:

```
<seaborn.axisgrid.FacetGrid at 0x1d6a2510310>
```



In [53]:

```
media_geral_gorjetas = gorjetas.gorjeta.mean()
```

In [54]:

```
media_geral_gorjetas
```

Out[54]:

```
2.9982786885245902
```

In [56]:

```
gorjetas.groupby(['dia_da_semana']).mean()[['valor_da_conta','gorjeta','porcentagem']]
```

Out[56]:

dia_da_semana	valor_da_conta	gorjeta	porcentagem
Domingo	21.410000	3.255132	0.166974
Quinta	17.682742	2.771452	0.161129
Sabado	20.441379	2.993103	0.153678
Sexta	17.151579	2.734737	0.169474

In [57]:

```
gorjetas.dia_da_semana.value_counts()
```

Out[57]:

```
Sabado      87
Domingo     76
Quinta      62
Sexta       19
Name: dia_da_semana, dtype: int64
```

In [58]:

```
valor_conta_domingo = gorjetas.query("dia_da_semana == 'Domingo'").valor_da_conta
```

In [60]:

```
valor_conta_sabado = gorjetas.query("dia_da_semana == 'Sabado'").valor_da_conta
```

In [62]:

```
ranksums(valor_conta_sabado, valor_conta_domingo)
```

Out[62]:

```
RanksumsResult(statistic=-0.9198084864360142, pvalue=0.3576728477868443)
```

A distribuição do valor da conta é igual no sabado e no domingo

Analise Hora do Dia

In [64]:

```
gorjetas.hora.unique()
```

Out[64]:

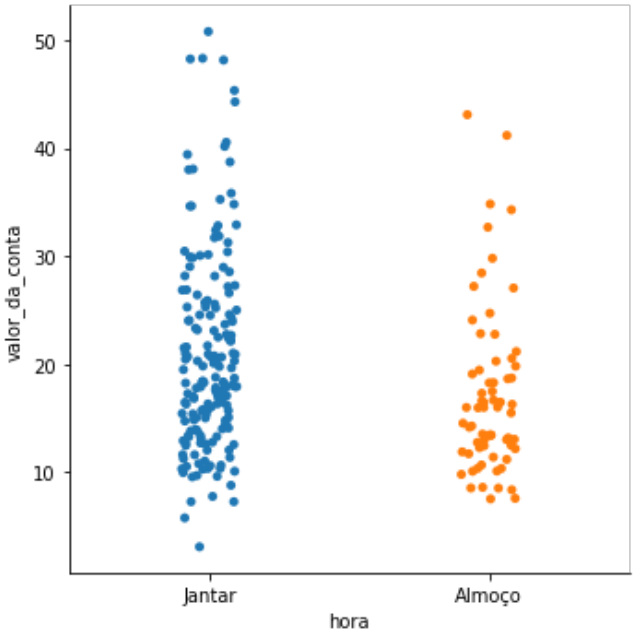
```
array(['Jantar', 'Almoço'], dtype=object)
```

In [65]:

```
sns.catplot(x='hora',y='valor_da_conta',data=gorjetas)
```

Out[65]:

```
<seaborn.axisgrid.FacetGrid at 0x1d6a3739940>
```

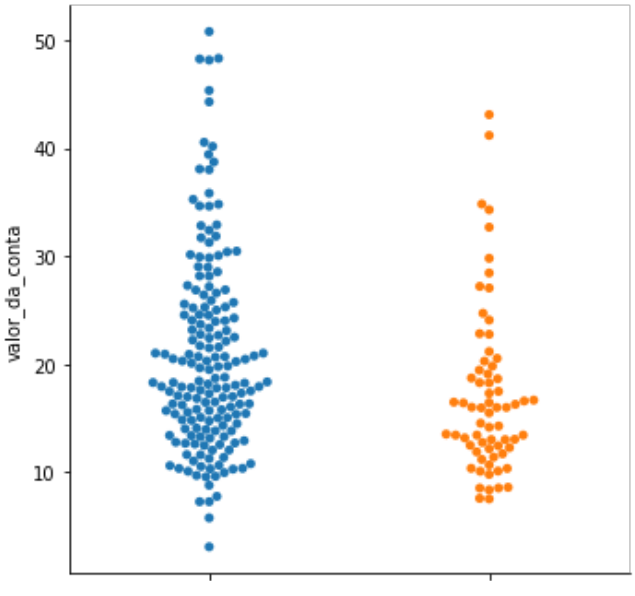


In [66]:

```
sns.catplot(x='hora',y='valor_da_conta',kind='swarm',data=gorjetas)
```

Out[66]:

```
<seaborn.axisgrid.FacetGrid at 0x1d6a2a932e0>
```

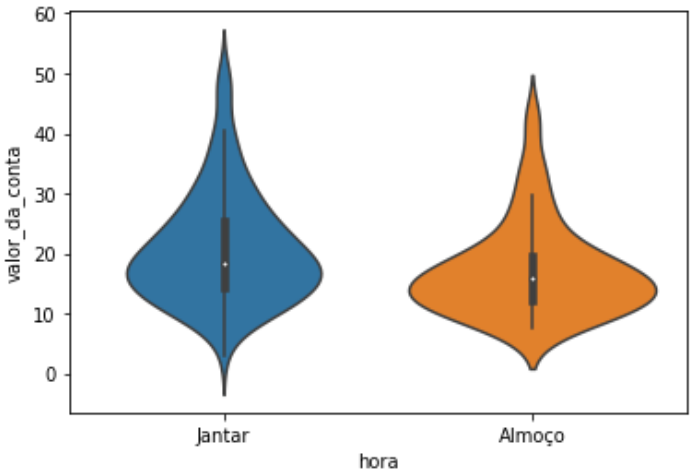


In [67]:

```
sns.violinplot(x='hora',y='valor_da_conta',data=gorjetas)
```

Out[67]:

```
<AxesSubplot:xlabel='hora', ylabel='valor_da_conta'>
```

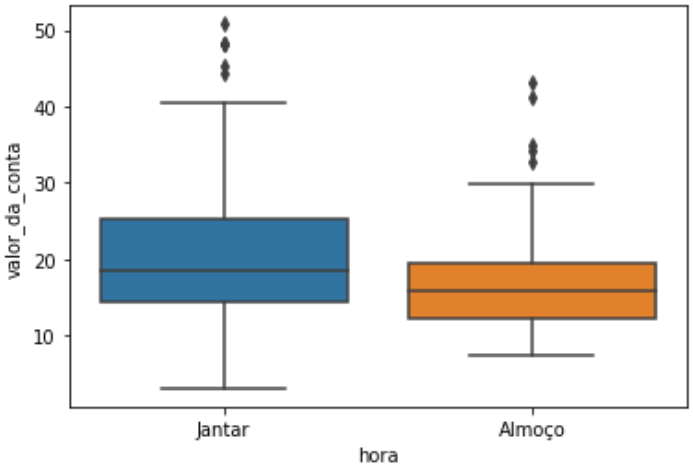


In [68]:

```
sns.boxplot(x='hora',y='valor_da_conta',data=gorjetas)
```

Out[68]:

```
<AxesSubplot:xlabel='hora', ylabel='valor_da_conta'>
```



In [70]:

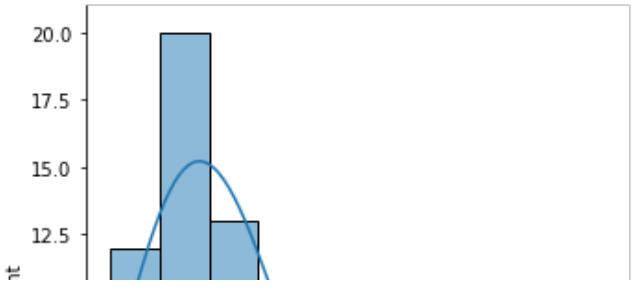
```
almoco = gorjetas.query("hora == 'Almoço'").valor_da_conta
```

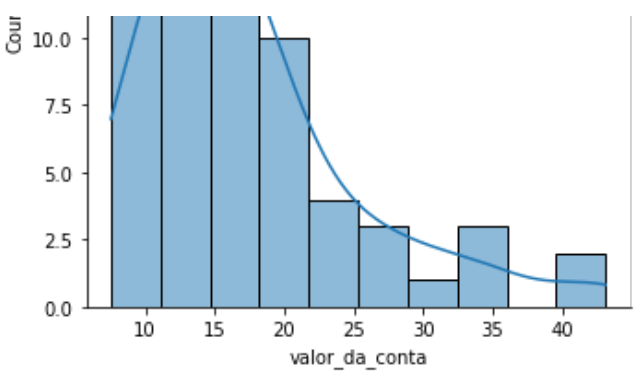
In [75]:

```
sns.displot(almoco, kde=True)
```

Out[75]:

```
<seaborn.axisgrid.FacetGrid at 0x1d6a4537b80>
```





In [76]:

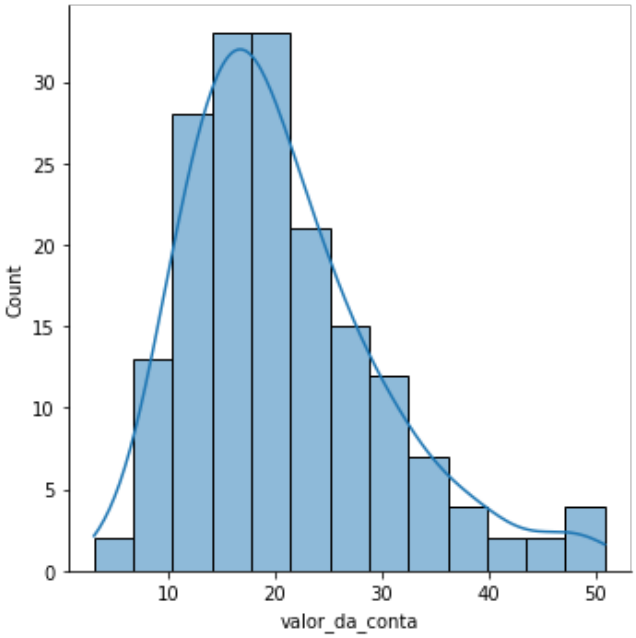
```
jantar = gorjetas.query("hora == 'Jantar'").valor_da_conta
```

In [78]:

```
sns.displot(jantar, kde=True)
```

Out[78]:

```
<seaborn.axisgrid.FacetGrid at 0x1d6a46333d0>
```



In [80]:

```
gorjetas.groupby(['hora']).mean()[['valor_da_conta','gorjeta','porcentagem']]
```

Out[80]:

hora	valor_da_conta	gorjeta	porcentagem
Almoço	17.168676	2.728088	0.163971
Jantar	20.797159	3.102670	0.159773

In [81]:

```
r = ranksums(jantar, almoco)
```

Out[81]:

```
RanksumsResult(statistic=3.2438872807262955, pvalue=0.0011791039723641672)
```

A Distribuição do valor da conta não é igual no jantar e no almoço

In [ ]: