

Assignment No.12

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import plotly.express as px
```

```
df= pd.read_csv("customer_shopping_data.csv")
df.head()
```

	invoice_no	customer_id	gender	age	category	quantity	price	payment_method	invoice_date	shopping_mall
0	I138884	C241288	Female	28	Clothing	5	1500.40	Credit Card	5/8/2022	Kanyon
1	I317333	C111565	Male	21	Shoes	3	1800.51	Debit Card	12/12/2021	Forum Istanbul
2	I127801	C266599	Male	20	Clothing	1	300.08	Cash	9/11/2021	Metrocity
3	I173702	C988172	Female	66	Shoes	5	3000.85	Credit Card	16/05/2021	Metropol AVM
4	I337046	C189076	Female	53	Books	4	60.60	Cash	24/10/2021	Kanyon

```
df.groupby("shopping_mall").count()
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df.groupby("shopping_mall").count()
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	invoice_no	customer_id	gender	age	category	quantity	price	payment_method	invoice_date
shopping_mall									
Cevahir AVM	4991	4991	4991	4991	4991	4991	4991		4991
Emaar Square Mall	4811	4811	4811	4811	4811	4811	4811		4811
Forum Istanbul	4947	4947	4947	4947	4947	4947	4947		4947
Istinye Park	9781	9781	9781	9781	9781	9781	9781		9781
Kanyon	19823	19823	19823	19823	19823	19823	19823		19823
Mall of Istanbul	19943	19943	19943	19943	19943	19943	19943		19943
Metrocity	15011	15011	15011	15011	15011	15011	15011		15011
Metropol AVM	10161	10161	10161	10161	10161	10161	10161		10161
Viaport Outlet	4914	4914	4914	4914	4914	4914	4914		4914
Zorlu Center	5075	5075	5075	5075	5075	5075	5075		5075

```
df.groupby("category").count()
```

	invoice_no	customer_id	gender	age	quantity	price	payment_method	invoice_date	shopping_mall
category									
Books	4981	4981	4981	4981	4981	4981	4981	4981	4981
Clothing	34487	34487	34487	34487	34487	34487	34487	34487	34487
Cosmetics	15097	15097	15097	15097	15097	15097	15097	15097	15097
Food & Beverage	14776	14776	14776	14776	14776	14776	14776	14776	14776
Shoes	10034	10034	10034	10034	10034	10034	10034	10034	10034
Souvenir	4999	4999	4999	4999	4999	4999	4999	4999	4999
Technology	4996	4996	4996	4996	4996	4996	4996	4996	4996
Toys	10087	10087	10087	10087	10087	10087	10087	10087	10087

```
branch_sales = df.groupby("shopping_mall").sum()

category_sales = df.groupby("category").sum()

branch_sales.sort_values(by = "price", ascending = False)
```

	invoice_no	customer_id	gender
hopping_mall			
Mall of Istanbul	I293112I196704I161949I267193I133061I157285I181...	C176086C289625C159164C317818C336576C123427C119...	FemaleFemaleFemaleFemaleMaleMaleMaleFemaleMale...
Kanyon	I138884I337046I326945I336189I252275I768348I147...	C241288C189076C283361C555402C313348C176727C245...	FemaleFemaleFemaleFemaleMaleFemaleMaleMaleFema...
Metrocity	I127801I293455I306368I640508I294687I174250I109...	C266599C159642C240286C225330C300786C204553C232...	MaleMaleFemaleFemaleMaleFemaleMaleFemaleFemale...
Metropol AVM	I173702I993048I473411I138674I218590I195567I297...	C988172C218149C452806C155059C224743C992677C183...	FemaleFemaleMaleMaleFemaleMaleMaleFemaleMaleMa...
Istinye Park	I121056I195396I209744I202367I664787I148377I204...	C151197C285161C251229C317478C237330C841663C173...	FemaleMaleMaleFemaleFemaleFemaleFemaleFemaleFe...
Zorlu Center	I195744I167211I246550I117291I205366I269690I140...	C330667C164092C716788C134449C241642C126436C218...	FemaleFemaleFemaleMaleFemaleMaleFemaleFemaleFe...
Cevahir AVM	I179802I992454I412481I823067I655874I221715I870...	C312861C196845C125696C322947C447138C187266C169...	MaleMaleFemaleMaleFemaleFemaleMaleFemaleFemale...

'laport Outlet	I688768I137794I283443I200392I147334I307534I176...	C362288C133687C189493C307921C306395C434171C876...	MaleFemaleMaleFemaleMaleFemaleFemaleMaleFemale...
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Emaar Square Mall	I139207I183746I217053I331891I339732I246562I276...	C191708C220180C192344C501658C276887C227070C136...	FemaleMaleMaleMaleMaleFemaleFemaleMaleMaleFema...
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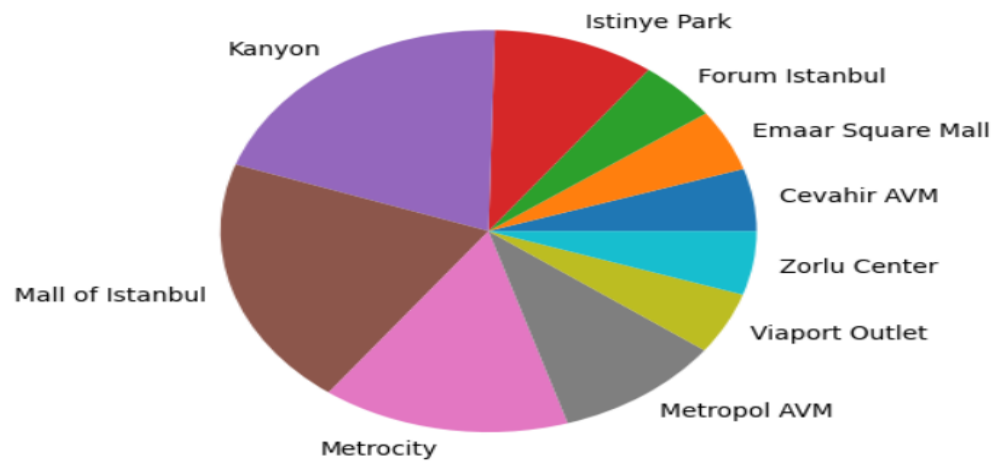
Forum Istanbul	I317333I227836I304265I402376I153930I134452I133...	C111565C657758C653385C309926C567813C112750C271...	MaleFemaleFemaleMaleMaleFemaleFemaleMaleFemale...
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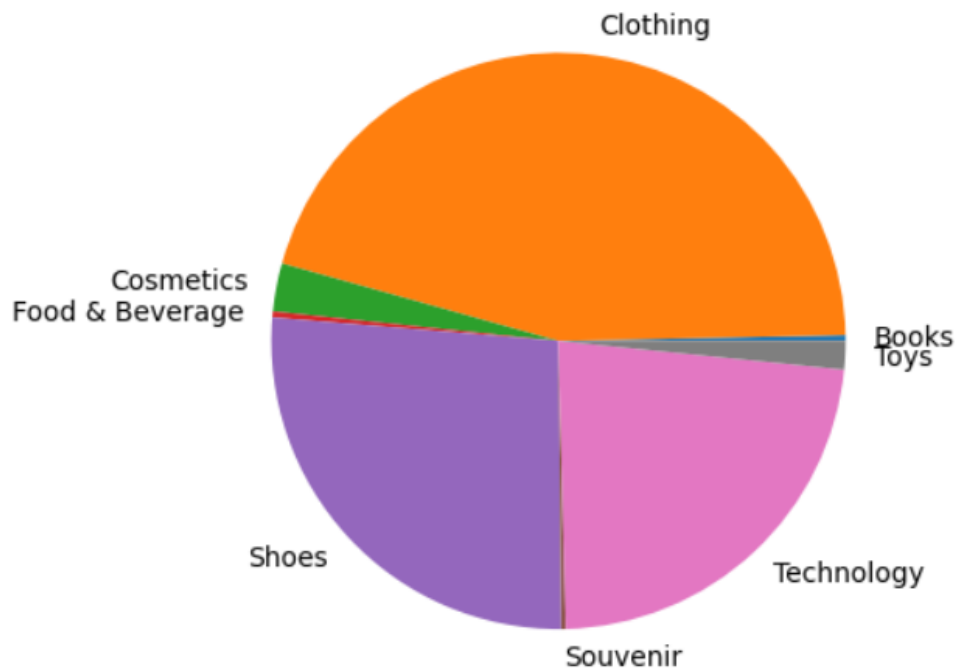
category_sales.sort_values(by = "price", ascending = False)

	invoice_no	customer_id	gender
category			
Clothing	I138884I127801I227836I293112I293455I326945I179...	C241288C266599C657758C176086C159642C283361C312...	FemaleMaleFemaleFemaleMaleFemaleMaleFemaleFema...
Shoes	I317333I173702I688768I217053I655874I768348I167...	C111565C988172C362288C192344C447138C176727C164...	MaleFemaleMaleMaleFemaleFemaleFemaleFemaleFema...
Technology	I252275I160777I88372I1289643I283443I164665I122...	C313348C626042C236859C584700C189493C255058C989...	MaleFemaleFemaleFemaleMaleFemaleFemaleFemaleFe...
Cosmetics	I121056I196704I209744I138674I752693I267193I269...	C151197C289625C251229C155059C306662C317818C126...	FemaleFemaleMaleMaleFemaleFemaleMaleFemaleFema...
Toys	I640508I992454I195396I161949I258195I181109I260...	C225330C196845C285161C159164C213742C119549C258...	FemaleMaleMaleFemaleMaleMaleMaleMaleFemaleFema...
Food & Beverage	I306368I195744I412481I339732I246550I137794I263...	C240286C330667C125696C276887C716788C133687C112...	FemaleFemaleFemaleMaleFemaleFemaleFemaleFemale...
Books	I337046I139207I294687I174250I117291I304265I202...	C189076C191708C300786C204553C134449C653385C317...	FemaleFemaleMaleFemaleMaleFemaleFemaleFemaleFe...
Souvenir	I204979I870944I151332I317105I317140I141241I285...	C173084C169749C168491C177975C326893C143442C194...	FemaleMaleMaleFemaleFemaleMaleFemaleFemaleFema...

```
combined_branch_category_sales = df.groupby(["shopping_mall", "category"]).sum()
combined_branch_category_sales
# pie chart for sales by branch
plt.figure(figsize=(12,21))
plt.pie(branch_sales["price"], labels = branch_sales.index)
plt.show()
```



```
plt.pie(category_sales["price"], labels = category_sales.index)
plt.show()
```



```
combined_pivot = df.pivot_table(index="shopping_mall", columns="category", values="price", aggfunc="sum")
# grouped bar chart for sales of different categories at different branches
combined_pivot.plot(kind="bar", figsize=(10, 6))
plt.show()
```

