

```
In [25]: import matplotlib.pyplot as plt  
import pandas as pd
```

```
In [26]: data = pd.read_csv("D:\\data_mobil (1).csv")
```

```
In [27]: data.shape
```

```
Out[27]: (53, 8)
```

```
In [28]: data.head()
```

```
Out[28]:
```

	Merk	Brand	Transmisi	cc	km	tahun	harga	harga_juta	
0	Toyota	Kijang Innova	1	1	1998	71500	2018	265000000	265.0
1	Toyota	Sienta	1	1	1497	90000	2016	172000000	172.0
2	Toyota	Fortuner	1	1	2393	15000	2021	575000000	575.0
3	Toyota	Fortuner	1	1	2393	75000	2016	385000000	385.0
4	Toyota	Harrier	1	1	1986	65000	2015	569000000	569.0

```
In [29]: data["Transmisi"]
```

```
Out[29]: 0      1
         1      1
         2      1
         3      1
         4      1
         5      1
         6      1
         7      1
         8      1
         9      1
        10      1
        11      1
        12      1
        13      1
        14      1
        15      1
        16      1
        17      1
        18      1
        19      1
        20      1
        21      1
        22      0
        23      0
        24      1
        25      1
        26      1
        27      1
        28      0
        29      1
        30      1
        31      1
        32      1
        33      1
        34      0
        35      1
        36      1
        37      1
        38      1
        39      1
        40      1
        41      1
        42      1
        43      1
        44      1
        45      0
        46      0
        47      1
        48      1
        49      1
        50      1
        51      1
        52      1
        Name: Transmisi, dtype: int64
```



```
In [30]: data.loc[(data["Transmisi"]==1), "Transmisi"] = "Automatic"
data.loc[(data["Transmisi"]==0), "Transmisi"] = "Manual"

data["Transmisi"]
```

```
Out[30]: 0    Automatic
1    Automatic
2    Automatic
3    Automatic
4    Automatic
5    Automatic
6    Automatic
7    Automatic
8    Automatic
9    Automatic
10   Automatic
11   Automatic
12   Automatic
13   Automatic
14   Automatic
15   Automatic
16   Automatic
17   Automatic
18   Automatic
19   Automatic
20   Automatic
21   Automatic
22   Manual
23   Manual
24   Automatic
25   Automatic
26   Automatic
27   Automatic
28   Manual
29   Automatic
30   Automatic
31   Automatic
32   Automatic
33   Automatic
34   Manual
35   Automatic
36   Automatic
37   Automatic
38   Automatic
39   Automatic
40   Automatic
41   Automatic
42   Automatic
43   Automatic
44   Automatic
45   Manual
46   Manual
47   Automatic
48   Automatic
49   Automatic
50   Automatic
```

```
51     Automatic
52     Automatic
Name: Transmisi, dtype: object
```

```
In [31]: data = data.assign(harga_1 = data["harga_juta"] * 0.98)
data = data.assign(harga_2 = data["harga_1"] * 0.98)

data
```

```
Out[31]:
```

	Merk	Brand	Transmisi	cc	km	tahun	harga	harga_juta	harga_1	harga
0	Toyota Kijang Innova	1	Automatic	1998	71500	2018	265000000	265.0	259.700	254.506
1	Toyota Sienta	1	Automatic	1497	90000	2016	172000000	172.0	168.560	165.188
2	Toyota Fortuner	1	Automatic	2393	15000	2021	575000000	575.0	563.500	552.230
3	Toyota Fortuner	1	Automatic	2393	75000	2016	385000000	385.0	377.300	369.754
4	Toyota Harrier	1	Automatic	1986	65000	2015	569000000	569.0	557.620	546.467
5	Toyota Camry Hybrid Sedan	1	Automatic	2487	6000	2021	750000000	750.0	735.000	720.300
6	Toyota Alphard	1	Automatic	2494	25000	2020	1200000000	1200.0	1176.000	1152.480
7	Toyota Avanza	1	Automatic	1496	70000	2017	177000000	177.0	173.460	169.990
8	Toyota Yaris	1	Automatic	1496	25000	2018	261000000	261.0	255.780	250.664
9	Toyota Camry	1	Automatic	2494	25000	2019	551000000	551.0	539.980	529.180
10	Toyota Avanza	1	Automatic	1496	100000	2016	142000000	142.0	139.160	136.376
11	Toyota Vios	1	Automatic	1496	65000	2018	206000000	206.0	201.880	197.842
12	Toyota Camry	1	Automatic	2494	93000	2013	190000000	190.0	186.200	182.476
13	Toyota Kijang Innova	1	Automatic	1998	6900	2018	299800000	299.8	293.804	287.927
14	Toyota Fortuner	1	Automatic	2494	200000	2009	200000000	200.0	196.000	192.080
15	Toyota Vios	1	Automatic	1497	125000	2014	144000000	144.0	141.120	138.297
16	Toyota Avanza	1	Automatic	1496	40000	2019	199000000	199.0	195.020	191.119
17	Toyota Avanza	1	Automatic	1496	15000	2021	238000000	238.0	233.240	228.575
18	Toyota Calya	1	Automatic	1197	25000	2019	138000000	138.0	135.240	132.535

	Merk	Brand	Transmisi	cc	km	tahun	harga	harga_juta	harga_1	harga
19	Toyota Avanza	1	Automatic	1496	20000	2021	230000000	230.0	225.400	220.892
20	Toyota Avanza	1	Automatic	1496	110000	2017	153000000	153.0	149.940	146.941
21	Toyota Avanza	1	Automatic	1496	110000	2014	115000000	115.0	112.700	110.446
22	Toyota Kijang Innova	1	Manual	1998	155000	2011	180000000	180.0	176.400	172.872
23	Toyota Kijang Innova	1	Manual	1998	155000	2008	125000000	125.0	122.500	120.050
24	Toyota Kijang Innova	1	Automatic	1998	40000	2015	285000000	285.0	279.300	273.714
25	Toyota Kijang Innova	1	Automatic	1998	20000	2019	330000000	330.0	323.400	316.932
26	Toyota Avanza	1	Automatic	1496	25000	2018	185000000	185.0	181.300	177.674
27	Toyota Avanza	1	Automatic	1496	63010	2019	190000000	190.0	186.200	182.476
28	Toyota Avanza	1	Manual	1496	115000	2016	147500000	147.5	144.550	141.659
29	Toyota Calya	1	Automatic	1197	75000	2018	122000000	122.0	119.560	117.168
30	Toyota Vios	1	Automatic	1496	110000	2009	90000000	90.0	88.200	86.436
31	Toyota Yaris	1	Automatic	1496	46149	2018	231000000	231.0	226.380	221.852
32	Toyota Avanza	1	Automatic	1496	202147	2011	94000000	94.0	92.120	90.277
33	Toyota Avanza	1	Automatic	1496	15000	2021	290000000	290.0	284.200	278.516
34	Toyota Rush	1	Manual	1496	45000	2015	168000000	168.0	164.640	161.347
35	Toyota Avanza	1	Automatic	1496	135000	2012	118000000	118.0	115.640	113.327
36	Toyota Agya	1	Automatic	1197	36959	2019	136000000	136.0	133.280	130.614
37	Toyota Voxy	1	Automatic	2494	45000	2017	381000000	381.0	373.380	365.912
38	Toyota Rush	1	Automatic	1496	55000	2019	225000000	225.0	220.500	216.090
39	Toyota Yaris	1	Automatic	1496	145000	2012	125000000	125.0	122.500	120.050

	Merk	Brand	Transmisi	cc	km	tahun	harga	harga_juta	harga_1	harga
40	Toyota Vios	1	Automatic	1496	65000	2018	206000000	206.0	201.880	197.842
41	Toyota Yaris	1	Automatic	1496	35000	2018	227000000	227.0	222.460	218.010
42	Toyota Avanza	1	Automatic	1496	100000	2016	152000000	152.0	148.960	145.980
43	Toyota Avanza	1	Automatic	1496	10000	2018	199000000	199.0	195.020	191.119
44	Toyota Agya	1	Automatic	998	75000	2016	109000000	109.0	106.820	104.683
45	Toyota Avanza	1	Manual	1296	200000	2013	50000000	50.0	49.000	48.020
46	Toyota Corolla	1	Manual	1597	220000	1990	50000000	50.0	49.000	48.020
47	Toyota Vios	1	Automatic	1496	170000	2010	100000000	100.0	98.000	96.040
48	Toyota Calya	1	Automatic	1197	80000	2017	100000000	100.0	98.000	96.040
49	Toyota Avanza	1	Automatic	1497	70000	2015	150000000	150.0	147.000	144.060
50	Toyota Rush	1	Automatic	1497	55000	2018	200000000	200.0	196.000	192.080


```
In [32]: #Filtering
#2. Carilah mobil diatas tahun 2015
#3. Carilah mobil dengan harga 200jt-270jt

f1 = data[data["tahun"]>2015]
f2 = data[(data["harga_juta"] >= 200) & (data["harga_juta"] <=270)]

f2
```

```
Out[32]:
```

	Merk	Brand	Transmisi	cc	km	tahun	harga	harga_juta	harga_1	harga_2	
0	Toyota	Kijang Innova	1	Automatic	1998	71500	2018	265000000	265.0	259.70	254.5060
8	Toyota	Yaris	1	Automatic	1496	25000	2018	261000000	261.0	255.78	250.6644
11	Toyota	Vios	1	Automatic	1496	65000	2018	206000000	206.0	201.88	197.8424
14	Toyota	Fortuner	1	Automatic	2494	200000	2009	200000000	200.0	196.00	192.0800
17	Toyota	Avanza	1	Automatic	1496	15000	2021	238000000	238.0	233.24	228.5752
19	Toyota	Avanza	1	Automatic	1496	20000	2021	230000000	230.0	225.40	220.8920
31	Toyota	Yaris	1	Automatic	1496	46149	2018	231000000	231.0	226.38	221.8524
38	Toyota	Rush	1	Automatic	1496	55000	2019	225000000	225.0	220.50	216.0900
40	Toyota	Vios	1	Automatic	1496	65000	2018	206000000	206.0	201.88	197.8424
41	Toyota	Yaris	1	Automatic	1496	35000	2018	227000000	227.0	222.46	218.0108
50	Toyota	Rush	1	Automatic	1497	55000	2018	200000000	200.0	196.00	192.0800
51	Toyota	Corolla Sedan	1	Automatic	1797	80000	2015	200000000	200.0	196.00	192.0800
52	Toyota	Corolla Sedan	1	Automatic	1797	60000	2018	250000000	250.0	245.00	240.1000

```
In [33]: #Visualisasi, pada tahun ke x rata-rata harga mobil bekasnya berapa, kemudian  
  
data_group = f2.groupby("tahun")["harga_juta", "harga_1", "harga_2"].mean().as  
data_group  
  
data_group.plot(kind="bar")  
plt.xlabel("Tahun")  
plt.ylabel("Harga(dalam juta)")  
plt.title("Rata-rata harga mobil bekas")  
plt.show
```

```
Out[33]: <function matplotlib.pyplot.show(close=None, block=None)>
```

