In [7]:
```
#import library matplotlib dan pandas
import matplotlib.pyplot as plt
import pandas as pd
```

In [8]:
```
#ambil data CSV

data = pd.read_csv('C:\\data_mobil.csv')
```

In [9]:
```
#Tampilkan jumlah baris dan kolom

data.shape
```

Out[9]:
```
(53, 8)
```

In [10]:
```
#Tampilkan 5 data terakhir
data.head()
```

Out[10]:

	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 [13]:
```
#Cari karakteristik data transmisi dan brand
data['Transmisi']
```

Out[13]:
```
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 [14]:
```
#Diubah transmisi 1 = Automatic, 0 diubah ke manual
data.loc[(data['Transmisi']==1),'Transmisi'] = 'Automatic'
data.loc[(data['Transmisi']==0),'Transmisi'] = 'Manual'

data['Transmisi']
```

Out[14]:
```
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 [15]:
```
#Buatlah perkiraan penyusutan harga mobil bekas 2 tahun berikutnya - >2%

data = data.assign(harga_1 = data['harga_juta'] * 0.98)
data = data.assign(harga_2 = data['harga_1'] * 0.98)

data
```

Out[15]:

	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

In [16]:
```
#Filtering
#1. Carilah mobil yang diatas tahun 2015
#2. Carilah mobil dengan harga 200jt-279jt

fl_1 = data[(data['tahun'] >= 2015) & (data['harga_juta'] <200)]
fl_1
```

Out[16]:

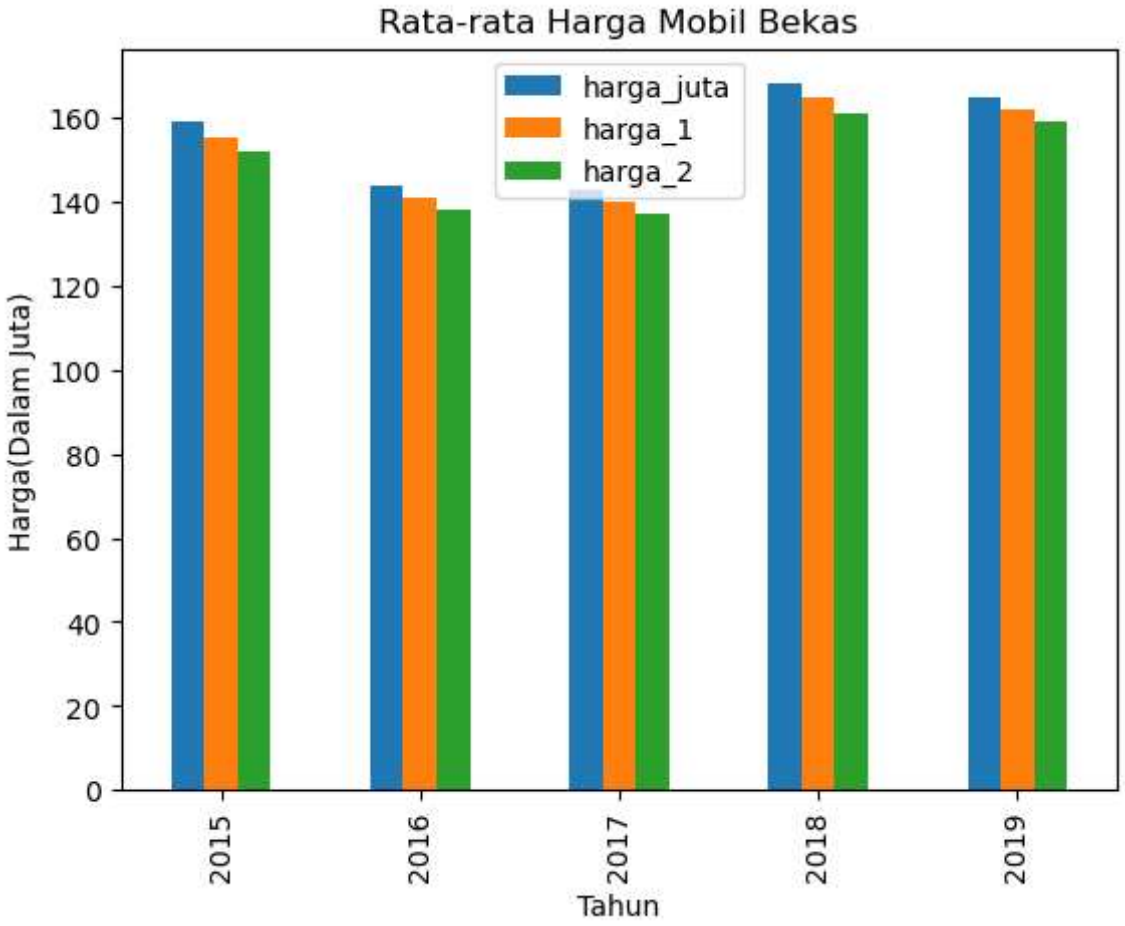
	Merk	Brand	Transmisi	cc	km	tahun	harga	harga_juta	harga_1	harga_2
1	Toyota Sienta	1	Automatic	1497	90000	2016	172000000	172.0	168.56	165.1888
7	Toyota Avanza	1	Automatic	1496	70000	2017	177000000	177.0	173.46	169.9908
10	Toyota Avanza	1	Automatic	1496	100000	2016	142000000	142.0	139.16	136.3768
16	Toyota Avanza	1	Automatic	1496	40000	2019	199000000	199.0	195.02	191.1196
18	Toyota Calya	1	Automatic	1197	25000	2019	138000000	138.0	135.24	132.5352
20	Toyota Avanza	1	Automatic	1496	110000	2017	153000000	153.0	149.94	146.9412
26	Toyota Avanza	1	Automatic	1496	25000	2018	185000000	185.0	181.30	177.6740
27	Toyota Avanza	1	Automatic	1496	63010	2019	190000000	190.0	186.20	182.4760
28	Toyota Avanza	1	Manual	1496	115000	2016	147500000	147.5	144.55	141.6590
29	Toyota Calya	1	Automatic	1197	75000	2018	122000000	122.0	119.56	117.1688
34	Toyota Rush	1	Manual	1496	45000	2015	168000000	168.0	164.64	161.3472
36	Toyota Agya	1	Automatic	1197	36959	2019	136000000	136.0	133.28	130.6144
42	Toyota Avanza	1	Automatic	1496	100000	2016	152000000	152.0	148.96	145.9808
43	Toyota Avanza	1	Automatic	1496	10000	2018	199000000	199.0	195.02	191.1196
44	Toyota Agya	1	Automatic	998	75000	2016	109000000	109.0	106.82	104.6836
48	Toyota Calya	1	Automatic	1197	80000	2017	100000000	100.0	98.00	96.0400
49	Toyota Avanza	1	Automatic	1497	70000	2015	150000000	150.0	147.00	144.0600

In [19]:
```
#Visualisasi, pada tahun ke X, rata" harga mobil bekas nya berapa, harga_1 berapa

data_group = fl_1.groupby('tahun')[['harga_juta','harga_1','harga_2']].mean().ast

data_group.plot(kind='bar')
plt.xlabel('Tahun')
plt.ylabel('Harga(Dalam Juta)')
plt.title('Rata-rata Harga Mobil Bekas')

plt.show()
```



In [ ]: