/Users/GiangDuong/PycharmProjects/CS1562021/venv/bin/python /Users/GiangDuong/PycharmProjects/CS1562021/hw2.py

waterfront renovated view ... sqft\_lot15 price yr\_built

0 0 0 0 ... 20000 363000 1961

1 0 0 0 ... 17334 100000 1978

2 0 yes 0 ... 5402 110000 1968

3 0 0 0 ... 7300 124500 1954

4 0 0 0 ... 18287 199129 1955

.. ... ... ... ... ... ... ...

356 0 0 4 ... 14547 500000 1986

357 0 0 0 ... 5195 349950 2013

358 0 0 0 ... 18900 552900 2014

359 0 0 2 ... 6500 549950 2014

360 yes 0 0 ... 41382 637000 2005

[361 rows x 17 columns]

Table value:

waterfront renovated view ... sqft\_lot15 price yr\_built

0 0 0 0 ... 20000 363000 1961

1 0 0 0 ... 17334 100000 1978

2 0 yes 0 ... 5402 110000 1968

3 0 0 0 ... 7300 124500 1954

4 0 0 0 ... 18287 199129 1955

.. ... ... ... ... ... ... ...

356 0 0 4 ... 14547 500000 1986

357 0 0 0 ... 5195 349950 2013

358 0 0 0 ... 18900 552900 2014

359 0 0 2 ... 6500 549950 2014

360 yes 0 0 ... 41382 637000 2005

[361 rows x 17 columns]

Convert to year 2020:

[array([59]), array([42]), array([52]), array([66]), array([65]), array([59]), array([41]), array([51]), array([64]), array([49]), array([43]), array([58]), array([111]), array([52]), array([65]), array([107]), array([53]), array([45]), array([77]), array([53]), array([53]), array([53]), array([68]), array([68]), array([42]), array([59]), array([32]), array([53]), array([48]), array([112]), array([74]), array([107]), array([51]), array([62]), array([48]), array([60]), array([55]), array([53]), array([108]), array([62]), array([58]), array([58]), array([54]), array([50]), array([67]), array([51]), array([60]), array([56]), array([46]), array([45]), array([61]), array([44]), array([73]), array([57]), array([107]), array([48]), array([58]), array([57]), array([72]), array([66]), array([78]), array([84]), array([77]), array([31]), array([53]), array([53]), array([34]), array([47]), array([47]), array([27]), array([45]), array([52]), array([50]), array([53]), array([45]), array([54]), array([47]), array([51]), array([56]), array([49]), array([40]), array([58]), array([39]), array([66]), array([53]), array([70]), array([66]), array([32]), array([51]), array([57]), array([56]), array([117]), array([74]), array([52]), array([37]), array([48]), array([58]), array([50]), array([53]), array([37]), array([40]), array([51]), array([42]), array([33]), array([30]), array([81]), array([54]), array([39]), array([30]), array([58]), array([31]), array([39]), array([56]), array([67]), array([35]), array([44]), array([41]), array([76]), array([53]), array([31]), array([55]), array([35]), array([74]), array([32]), array([51]), array([84]), array([57]), array([57]), array([36]), array([58]), array([40]), array([70]), array([54]), array([37]), array([42]), array([82]), array([52]), array([112]), array([58]), array([60]), array([52]), array([55]), array([42]), array([67]), array([67]), array([58]), array([58]), array([36]), array([25]), array([60]), array([31]), array([74]), array([36]), array([46]), array([35]), array([35]), array([26]), array([57]), array([53]), array([17]), array([53]), array([46]), array([28]), array([52]), array([58]), array([17]), array([35]), array([53]), array([61]), array([26]), array([73]), array([34]), array([22]), array([10]), array([32]), array([101]), array([6]), array([41]), array([61]), array([52]), array([43]), array([22]), array([59]), array([42]), array([55]), array([32]), array([21]), array([21]), array([41]), array([42]), array([29]), array([21]), array([58]), array([56]), array([23]), array([55]), array([44]), array([46]), array([36]), array([41]), array([34]), array([33]), array([53]), array([32]), array([44]), array([58]), array([61]), array([37]), array([16]), array([24]), array([11]), array([20]), array([46]), array([43]), array([24]), array([30]), array([35]), array([27]), array([17]), array([20]), array([27]), array([20]), array([14]), array([11]), array([20]), array([33]), array([31]), array([21]), array([8]), array([14]), array([34]), array([32]), array([15]), array([15]), array([33]), array([16]), array([26]), array([12]), array([12]), array([30]), array([8]), array([8]), array([11]), array([39]), array([6]), array([7]), array([41]), array([30]), array([13]), array([42]), array([32]), array([9]), array([52]), array([15]), array([18]), array([13]), array([6]), array([27]), array([44]), array([36]), array([41]), array([16]), array([32]), array([13]), array([28]), array([32]), array([27]), array([14]), array([14]), array([33]), array([11]), array([22]), array([8]), array([15]), array([41]), array([6]), array([8]), array([38]), array([22]), array([10]), array([7]), array([55]), array([19]), array([30]), array([19]), array([16]), array([14]), array([7]), array([15]), array([13]), array([19]), array([13]), array([13]), array([13]), array([7]), array([14]), array([19]), array([9]), array([8]), array([17]), array([11]), array([17]), array([6]), array([7]), array([19]), array([18]), array([14]), array([15]), array([15]), array([19]), array([41]), array([53]), array([13]), array([7]), array([17]), array([20]), array([6]), array([19]), array([14]), array([31]), array([6]), array([6]), array([19]), array([19]), array([23]), array([19]), array([14]), array([14]), array([15]), array([65]), array([12]), array([41]), array([100]), array([17]), array([19]), array([62]), array([6]), array([42]), array([27]), array([27]), array([27]), array([53]), array([6]), array([6]), array([6]), array([21]), array([18]), array([51]), array([28]), array([6]), array([6]), array([14]), array([72]), array([7]), array([19]), array([30]), array([34]), array([7]), array([6]), array([6]), array([15])]

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[2.0000e+04]

[2.0000e+00]

[2.5100e+03]

[0.0000e+00]

[5.9000e+01]

[2.1300e+03]

[2.0000e+04]]

[[4.0000e+00]

[2.2500e+00]

[1.5000e+03]

[5.3930e+03]

[2.0000e+00]

[1.5000e+03]

[0.0000e+00]

[2.1000e+01]

[1.5000e+03]

[5.9520e+03]]

[[4.0000e+00]

[2.2500e+00]

[2.8700e+03]

[5.3930e+03]

[2.0000e+00]

[2.8700e+03]

[0.0000e+00]

[2.1000e+01]

[1.5000e+03]

[5.9520e+03]]

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[3.5000e+00]

[4.0830e+03]

[6.8377e+04]

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[4.0830e+03]

[0.0000e+00]

[1.5000e+01]

[2.4300e+03]

[4.1382e+04]]

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[1.5000e+01]

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[2.8700e+03]

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[1.5000e+01]

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[4.1382e+04]]

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[2.0000e+00]

[7.5000e+02]

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[1.5000e+01]

[2.4300e+03]

[4.1382e+04]]]

After transform X=

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[2.0000e+00 1.0000e+00 8.2800e+02 ... 5.2000e+01 8.2800e+02 5.4020e+03]

...

[4.0000e+00 3.5000e+00 3.8280e+03 ... 6.0000e+00 2.1200e+03 1.8900e+04]

[4.0000e+00 3.5000e+00 3.9060e+03 ... 6.0000e+00 2.6730e+03 6.5000e+03]

[4.0000e+00 3.5000e+00 4.0830e+03 ... 1.5000e+01 2.4300e+03 4.1382e+04]]

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[178500.]

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[199500.]

[185900.]

[184000.]

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[238000.]

[139000.]

[225000.]

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[210500.]

[201000.]

[199000.]

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[225000.]

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[195000.]

[150000.]

[196500.]

[205000.]

[159000.]

[205000.]

[230000.]

[269950.]

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[429000.]

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[235000.]

[225000.]

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[200000.]

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[305000.]

[207000.]

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[215000.]

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[165000.]

[350000.]

[238000.]

[246900.]

[190848.]

[162500.]

[257000.]

[232000.]

[260000.]

[252000.]

[224000.]

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[264500.]

[220000.]

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[229500.]

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[199950.]

[206000.]

[215000.]

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[220000.]

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[4.0000e+00 2.5000e+00 2.6280e+03 1.1466e+04 2.0000e+00 2.6280e+03

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[3.0000e+00 1.7500e+00 1.1400e+03 9.8000e+03 1.0000e+00 1.1400e+03

0.0000e+00 5.2000e+01 1.3700e+03 9.8000e+03]

[4.0000e+00 1.7500e+00 2.0800e+03 7.2000e+03 1.0000e+00 1.0500e+03

1.0300e+03 5.4000e+01 1.5000e+03 7.3500e+03]

[4.0000e+00 2.0000e+00 1.9100e+03 4.2250e+03 1.0000e+00 9.1000e+02

1.0000e+03 1.0100e+02 1.0600e+03 4.8000e+03]

[3.0000e+00 2.0000e+00 1.5100e+03 9.1530e+03 1.0000e+00 1.5100e+03

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8.5000e+02 4.2000e+01 1.9400e+03 7.4200e+03]

[4.0000e+00 2.5000e+00 2.4000e+03 4.5960e+03 2.0000e+00 2.4000e+03

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[3.0000e+00 1.5000e+00 1.1000e+03 3.3600e+04 1.0000e+00 1.1000e+03

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[4.0000e+00 2.5000e+00 2.0600e+03 1.6000e+04 2.0000e+00 2.0600e+03

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0.0000e+00 1.0000e+01 2.4090e+03 6.2640e+03]

[4.0000e+00 1.7500e+00 1.7900e+03 1.2000e+04 1.0000e+00 1.7900e+03

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[3.0000e+00 1.0000e+00 1.3100e+03 9.6120e+03 1.0000e+00 9.6000e+02

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[4.0000e+00 3.5000e+00 3.8280e+03 1.8900e+04 2.5000e+00 3.8280e+03

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[3.0000e+00 1.5000e+00 1.2200e+03 7.3000e+03 1.0000e+00 1.2200e+03

0.0000e+00 4.7000e+01 1.2600e+03 7.3470e+03]

[3.0000e+00 2.0000e+00 1.4500e+03 1.1204e+04 1.0000e+00 1.4500e+03

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[4.0000e+00 1.5000e+00 2.0500e+03 7.1000e+03 1.0000e+00 1.0500e+03

1.0000e+03 5.7000e+01 1.9500e+03 7.3500e+03]

[2.0000e+00 1.7500e+00 1.2200e+03 1.5600e+04 1.0000e+00 1.2200e+03

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[3.0000e+00 1.7500e+00 1.8800e+03 3.0346e+04 1.0000e+00 1.8800e+03

0.0000e+00 3.2000e+01 2.2600e+03 5.8830e+03]

[3.0000e+00 1.0000e+00 8.6000e+02 3.3664e+04 1.0000e+00 8.6000e+02

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[4.0000e+00 1.7500e+00 1.8500e+03 7.3500e+03 1.0000e+00 1.0500e+03

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[3.0000e+00 2.5000e+00 1.9400e+03 1.0350e+04 1.0000e+00 1.4200e+03

5.2000e+02 4.1000e+01 1.8100e+03 7.8000e+03]

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[4.0000e+00 2.5000e+00 2.0300e+03 4.5960e+03 2.0000e+00 2.0300e+03

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[4.0000e+00 2.2500e+00 2.7100e+03 2.2860e+04 1.0000e+00 1.8500e+03

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[3.0000e+00 1.7500e+00 1.4400e+03 1.1325e+04 1.0000e+00 1.4400e+03

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[4.0000e+00 1.7500e+00 1.8800e+03 9.6000e+03 1.0000e+00 1.0200e+03

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[4.0000e+00 2.5000e+00 1.9210e+03 4.8880e+03 2.0000e+00 1.9210e+03

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[3.0000e+00 1.0000e+00 9.2000e+02 9.8120e+03 1.0000e+00 9.2000e+02

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[2.0000e+00 1.0000e+00 1.0500e+03 6.0113e+04 1.0000e+00 1.0500e+03

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[3.0000e+00 2.0000e+00 1.7900e+03 7.8790e+03 1.5000e+00 1.7900e+03

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[4.0000e+00 2.5000e+00 2.2330e+03 6.0250e+03 2.0000e+00 2.2330e+03

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[4.0000e+00 2.5000e+00 1.6100e+03 4.5680e+03 2.0000e+00 1.6100e+03

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[4.0000e+00 2.5000e+00 3.1180e+03 7.8660e+03 2.0000e+00 3.1180e+03

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[3.0000e+00 2.5000e+00 2.2800e+03 7.4170e+03 2.0000e+00 2.2800e+03

0.0000e+00 2.2000e+01 2.3700e+03 6.4430e+03]

[2.0000e+00 2.5000e+00 1.1500e+03 2.0640e+03 2.0000e+00 1.1500e+03

0.0000e+00 1.6000e+01 1.8800e+03 2.8550e+03]

[3.0000e+00 2.0000e+00 1.4100e+03 8.3840e+03 1.0000e+00 1.4100e+03

0.0000e+00 3.5000e+01 1.4100e+03 9.2050e+03]

[4.0000e+00 2.5000e+00 2.1630e+03 5.8820e+03 2.0000e+00 2.1630e+03

0.0000e+00 1.4000e+01 1.7600e+03 9.6000e+03]

[3.0000e+00 1.0000e+00 9.7000e+02 1.4850e+04 1.0000e+00 9.7000e+02

0.0000e+00 5.2000e+01 1.4100e+03 1.4850e+04]

[4.0000e+00 2.0000e+00 1.6700e+03 9.9870e+03 1.0000e+00 1.6700e+03

0.0000e+00 5.3000e+01 1.6400e+03 7.2800e+03]

[4.0000e+00 1.7500e+00 1.8900e+03 9.6230e+03 1.0000e+00 1.2900e+03

6.0000e+02 5.1000e+01 1.5100e+03 9.7110e+03]

[3.0000e+00 2.2500e+00 1.5900e+03 1.1745e+04 1.0000e+00 1.0900e+03

5.0000e+02 4.2000e+01 1.5400e+03 1.2530e+04]

[3.0000e+00 2.5000e+00 1.9700e+03 9.6070e+03 2.0000e+00 1.0900e+03

8.8000e+02 3.2000e+01 2.0200e+03 9.6080e+03]

[4.0000e+00 2.5000e+00 2.7700e+03 7.0000e+03 1.0000e+00 1.9400e+03

8.3000e+02 4.1000e+01 2.1400e+03 7.6840e+03]

[4.0000e+00 2.7500e+00 2.2400e+03 7.2000e+03 1.0000e+00 1.1400e+03

1.1000e+03 5.3000e+01 1.5800e+03 7.4160e+03]

[3.0000e+00 1.5000e+00 1.6000e+03 1.0548e+04 1.0000e+00 1.6000e+03

0.0000e+00 5.8000e+01 2.8800e+03 1.3609e+04]

[2.0000e+00 1.0000e+00 9.0000e+02 1.3531e+04 1.0000e+00 9.0000e+02

0.0000e+00 4.1000e+01 1.7670e+03 8.3080e+03]

[4.0000e+00 2.5000e+00 1.9340e+03 5.6770e+03 2.0000e+00 1.9340e+03

0.0000e+00 7.0000e+00 1.9190e+03 5.0490e+03]

[3.0000e+00 2.0000e+00 1.5600e+03 7.3520e+03 1.0000e+00 1.5600e+03

0.0000e+00 2.8000e+01 1.1200e+03 7.9500e+03]

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0.0000e+00 4.4000e+01 1.5600e+03 7.5240e+03]

[4.0000e+00 1.5000e+00 2.0700e+03 7.2450e+03 1.0000e+00 1.0600e+03

1.0100e+03 5.6000e+01 1.4500e+03 7.3500e+03]

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8.7000e+02 2.0000e+01 1.6960e+03 5.7934e+04]

[3.0000e+00 1.5000e+00 1.5600e+03 7.3000e+03 1.0000e+00 1.0400e+03

5.2000e+02 5.6000e+01 1.4600e+03 7.9100e+03]

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0.0000e+00 1.9000e+01 2.4060e+03 7.6420e+03]

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8.8000e+02 5.2000e+01 1.5900e+03 9.8000e+03]

[2.0000e+00 2.7500e+00 1.5900e+03 2.0917e+04 1.5000e+00 1.5900e+03

0.0000e+00 1.0000e+02 1.3100e+03 6.0000e+03]

[5.0000e+00 1.7500e+00 2.3200e+03 7.7000e+03 1.0000e+00 1.2900e+03

1.0300e+03 5.8000e+01 1.7400e+03 7.2100e+03]

[3.0000e+00 1.0000e+00 1.1400e+03 9.6390e+03 1.0000e+00 1.1400e+03

0.0000e+00 5.3000e+01 1.1400e+03 9.6390e+03]

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0.0000e+00 1.3000e+01 2.4340e+03 4.4000e+03]

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0.0000e+00 1.7000e+01 2.7400e+03 5.8160e+03]

[3.0000e+00 2.5000e+00 1.6000e+03 6.8480e+03 2.0000e+00 1.6000e+03

0.0000e+00 2.0000e+01 1.7000e+03 7.2100e+03]

[3.0000e+00 2.5000e+00 1.7200e+03 6.8470e+03 2.0000e+00 1.7200e+03

0.0000e+00 3.3000e+01 1.6100e+03 7.7900e+03]

[3.0000e+00 2.0000e+00 1.8500e+03 9.5500e+03 1.0000e+00 1.8500e+03

0.0000e+00 3.2000e+01 2.2500e+03 9.5500e+03]]

X\_train

[[3.0000e+00 2.2500e+00 2.0700e+03 ... 4.6000e+01 1.8900e+03 7.5190e+03]

[3.0000e+00 3.0000e+00 2.2900e+03 ... 7.2000e+01 1.8900e+03 1.4143e+04]

[4.0000e+00 2.2500e+00 2.8100e+03 ... 6.1000e+01 2.0200e+03 1.6140e+04]

...

[4.0000e+00 1.5000e+00 1.3700e+03 ... 5.0000e+01 1.3700e+03 7.9000e+03]

[3.0000e+00 2.5000e+00 1.8300e+03 ... 1.6000e+01 2.4880e+03 4.9980e+03]

[3.0000e+00 1.0000e+00 1.2500e+03 ... 5.3000e+01 1.3000e+03 7.9200e+03]]

y\_test

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[206000.]

[198000.]

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[214100.]

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[184000.]

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[314950.]

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[355000.]

[260000.]

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y\_train

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[384000.]

[269500.]

[239950.]

[270000.]

[349950.]

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[234950.]

[198000.]

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[353500.]

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[359500.]

[195000.]

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[159000.]

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[194250.]

[212000.]

[290000.]

[265000.]

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[280000.]

[100000.]

[313100.]

[220000.]

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[195000.]

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[245000.]

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[124500.]

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[286651.]

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PART B: Use Simple Linear Regression to predict the house price using Sqft\_living as the independent variable

sqrt\_living

[[2510.]

[ 770.]

[ 828.]

[ 840.]

[ 860.]

[ 900.]

[ 900.]

[ 910.]

[ 910.]

[ 910.]

[ 920.]

[ 920.]

[ 940.]

[ 970.]

[ 980.]

[1000.]

[1010.]

[1010.]

[1050.]

[1070.]

[1070.]

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[1088.]

[1100.]

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[1120.]

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[1360.]

[1370.]

[1390.]

[1440.]

[1510.]

[1510.]

[1540.]

[1580.]

[1610.]

[1660.]

[1690.]

[1710.]

[1730.]

[1730.]

[1747.]

[1780.]

[1900.]

[1960.]

[1980.]

[1000.]

[1100.]

[1100.]

[1200.]

[1220.]

[1280.]

[1320.]

[1360.]

[1370.]

[1370.]

[1390.]

[1400.]

[1460.]

[1540.]

[1550.]

[1560.]

[1580.]

[1580.]

[1600.]

[1660.]

[1670.]

[1780.]

[1800.]

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[1370.]

[1380.]

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[1880.]

[1880.]

[1890.]

[1894.]

[1910.]

[1910.]

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[2056.]

[2080.]

[2080.]

[2100.]

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[2180.]

[2240.]

[2259.]

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[2710.]

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[1380.]

[1380.]

[1390.]

[1400.]

[1410.]

[1410.]

[1430.]

[1440.]

[1440.]

[1450.]

[1450.]

[1510.]

[1560.]

[1560.]

[1590.]

[1630.]

[1660.]

[1670.]

[1720.]

[1730.]

[1760.]

[1770.]

[1790.]

[1824.]

[1850.]

[1910.]

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[2030.]

[2080.]

[2130.]

[2190.]

[2250.]

[2270.]

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[2740.]

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[1500.]

[1560.]

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[1630.]

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[1820.]

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[1830.]

[2060.]

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[2100.]

[2120.]

[2190.]

[2190.]

[2320.]

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[2560.]

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[1560.]

[1570.]

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[2495.]

[2497.]

[2502.]

[2507.]

[2550.]

[2575.]

[2594.]

[2600.]

[2610.]

[2620.]

[2628.]

[2632.]

[2650.]

[2650.]

[2650.]

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[2789.]

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[3230.]

[3380.]

[3430.]

[3504.]

[3597.]

[3710.]

[3860.]

[4073.]

[1560.]

[1590.]

[1770.]

[1830.]

[1900.]

[2050.]

[2060.]

[2140.]

[2140.]

[2190.]

[2240.]

[2260.]

[2481.]

[2656.]

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[2050.]

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[2590.]

[2670.]

[3720.]

[2796.]

[3828.]

[3906.]

[4083.]]

X\_test sqrt\_living

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0.0000e+00 1.5000e+01 2.5900e+03 1.8386e+04]

[4.0000e+00 2.5000e+00 2.6280e+03 1.1466e+04 2.0000e+00 2.6280e+03

0.0000e+00 6.0000e+00 2.8490e+03 1.0909e+04]

[3.0000e+00 1.7500e+00 1.1400e+03 9.8000e+03 1.0000e+00 1.1400e+03

0.0000e+00 5.2000e+01 1.3700e+03 9.8000e+03]

[4.0000e+00 1.7500e+00 2.0800e+03 7.2000e+03 1.0000e+00 1.0500e+03

1.0300e+03 5.4000e+01 1.5000e+03 7.3500e+03]

[4.0000e+00 2.0000e+00 1.9100e+03 4.2250e+03 1.0000e+00 9.1000e+02

1.0000e+03 1.0100e+02 1.0600e+03 4.8000e+03]

[3.0000e+00 2.0000e+00 1.5100e+03 9.1530e+03 1.0000e+00 1.5100e+03

0.0000e+00 4.6000e+01 1.7800e+03 9.2860e+03]

[3.0000e+00 1.0000e+00 9.0000e+02 1.0511e+04 1.0000e+00 9.0000e+02

0.0000e+00 5.9000e+01 1.4600e+03 1.0643e+04]

[4.0000e+00 2.7500e+00 3.2300e+03 1.2651e+04 2.0000e+00 3.2300e+03

0.0000e+00 1.8000e+01 2.5500e+03 1.2081e+04]

[4.0000e+00 2.7500e+00 2.0600e+03 7.3500e+03 1.0000e+00 1.2100e+03

8.5000e+02 4.2000e+01 1.9400e+03 7.4200e+03]

[4.0000e+00 2.5000e+00 2.4000e+03 4.5960e+03 2.0000e+00 2.4000e+03

0.0000e+00 1.6000e+01 2.2300e+03 4.7630e+03]

[3.0000e+00 1.7500e+00 1.5800e+03 1.4400e+04 1.0000e+00 1.5800e+03

0.0000e+00 3.9000e+01 1.4800e+03 9.6000e+03]

[4.0000e+00 2.5000e+00 3.1700e+03 1.0688e+04 2.0000e+00 3.1700e+03

0.0000e+00 1.9000e+01 3.1000e+03 1.2610e+04]

[3.0000e+00 1.5000e+00 1.1000e+03 3.3600e+04 1.0000e+00 1.1000e+03

0.0000e+00 5.3000e+01 1.5700e+03 3.2700e+04]

[4.0000e+00 2.5000e+00 2.0600e+03 1.6000e+04 2.0000e+00 2.0600e+03

0.0000e+00 2.7000e+01 1.5300e+03 8.0000e+03]

[3.0000e+00 2.0000e+00 1.8240e+03 7.1200e+03 1.0000e+00 1.8240e+03

0.0000e+00 1.0000e+01 2.4090e+03 6.2640e+03]

[4.0000e+00 1.7500e+00 1.7900e+03 1.2000e+04 1.0000e+00 1.7900e+03

0.0000e+00 7.6000e+01 1.5500e+03 9.8400e+03]

[3.0000e+00 1.0000e+00 1.3100e+03 9.6120e+03 1.0000e+00 9.6000e+02

3.5000e+02 5.8000e+01 1.3100e+03 9.8120e+03]

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[6.0000e+00 1.5000e+00 2.1400e+03 3.6509e+04 1.5000e+00 2.1400e+03

0.0000e+00 1.1700e+02 1.7100e+03 1.2000e+04]

[4.0000e+00 3.5000e+00 3.8280e+03 1.8900e+04 2.5000e+00 3.8280e+03

0.0000e+00 6.0000e+00 2.1200e+03 1.8900e+04]

[3.0000e+00 1.5000e+00 1.2200e+03 7.3000e+03 1.0000e+00 1.2200e+03

0.0000e+00 4.7000e+01 1.2600e+03 7.3470e+03]

[3.0000e+00 2.0000e+00 1.4500e+03 1.1204e+04 1.0000e+00 1.4500e+03

0.0000e+00 1.7000e+01 1.5200e+03 9.5180e+03]

[4.0000e+00 1.5000e+00 2.0500e+03 7.1000e+03 1.0000e+00 1.0500e+03

1.0000e+03 5.7000e+01 1.9500e+03 7.3500e+03]

[2.0000e+00 1.7500e+00 1.2200e+03 1.5600e+04 1.0000e+00 1.2200e+03

0.0000e+00 4.8000e+01 1.5100e+03 1.7818e+04]

[3.0000e+00 1.7500e+00 1.8800e+03 3.0346e+04 1.0000e+00 1.8800e+03

0.0000e+00 3.2000e+01 2.2600e+03 5.8830e+03]

[3.0000e+00 1.0000e+00 8.6000e+02 3.3664e+04 1.0000e+00 8.6000e+02

0.0000e+00 6.5000e+01 1.2900e+03 1.8287e+04]

[4.0000e+00 1.7500e+00 1.8500e+03 7.3500e+03 1.0000e+00 1.0500e+03

8.0000e+02 5.5000e+01 1.4500e+03 7.2500e+03]

[3.0000e+00 2.5000e+00 1.9400e+03 1.0350e+04 1.0000e+00 1.4200e+03

5.2000e+02 4.1000e+01 1.8100e+03 7.8000e+03]

[3.0000e+00 1.0000e+00 1.0100e+03 7.5200e+03 1.0000e+00 1.0100e+03

0.0000e+00 4.5000e+01 1.3700e+03 8.4690e+03]

[4.0000e+00 2.5000e+00 2.0300e+03 4.5960e+03 2.0000e+00 2.0300e+03

0.0000e+00 6.0000e+00 2.0400e+03 4.7050e+03]

[3.0000e+00 1.5000e+00 1.3900e+03 7.4170e+03 1.0000e+00 1.3900e+03

0.0000e+00 5.3000e+01 1.3900e+03 7.6650e+03]

[4.0000e+00 2.2500e+00 2.7100e+03 2.2860e+04 1.0000e+00 1.8500e+03

8.6000e+02 5.8000e+01 1.7000e+03 2.2860e+04]

[3.0000e+00 1.7500e+00 1.4400e+03 1.1325e+04 1.0000e+00 1.4400e+03

0.0000e+00 5.4000e+01 1.4400e+03 2.0000e+04]

[4.0000e+00 1.7500e+00 1.8800e+03 9.6000e+03 1.0000e+00 1.0200e+03

8.6000e+02 7.4000e+01 1.5600e+03 1.4400e+04]

[4.0000e+00 2.5000e+00 1.9210e+03 4.8880e+03 2.0000e+00 1.9210e+03

0.0000e+00 1.1000e+01 1.9210e+03 9.1400e+03]

[3.0000e+00 1.0000e+00 9.2000e+02 9.8120e+03 1.0000e+00 9.2000e+02

0.0000e+00 5.8000e+01 1.1880e+03 9.8120e+03]

[2.0000e+00 1.0000e+00 1.0500e+03 6.0113e+04 1.0000e+00 1.0500e+03

0.0000e+00 7.7000e+01 1.3800e+03 2.7442e+04]

[3.0000e+00 2.0000e+00 1.7900e+03 7.8790e+03 1.5000e+00 1.7900e+03

0.0000e+00 2.2000e+01 1.7900e+03 7.8790e+03]

[4.0000e+00 2.5000e+00 2.2330e+03 6.0250e+03 2.0000e+00 2.2330e+03

0.0000e+00 8.0000e+00 1.5440e+03 6.0360e+03]

[3.0000e+00 1.7500e+00 2.3200e+03 5.5847e+04 1.0000e+00 2.3200e+03

0.0000e+00 6.0000e+01 2.4000e+03 2.6112e+04]

[4.0000e+00 2.5000e+00 1.6100e+03 4.5680e+03 2.0000e+00 1.6100e+03

0.0000e+00 1.4000e+01 1.8340e+03 4.6040e+03]

[4.0000e+00 2.5000e+00 3.1180e+03 7.8660e+03 2.0000e+00 3.1180e+03

0.0000e+00 6.0000e+00 2.6730e+03 6.5000e+03]

[3.0000e+00 2.0000e+00 1.6300e+03 8.0180e+03 1.0000e+00 1.6300e+03

0.0000e+00 1.7000e+01 1.6100e+03 8.3970e+03]

[3.0000e+00 2.5000e+00 2.2800e+03 7.4170e+03 2.0000e+00 2.2800e+03

0.0000e+00 2.2000e+01 2.3700e+03 6.4430e+03]

[2.0000e+00 2.5000e+00 1.1500e+03 2.0640e+03 2.0000e+00 1.1500e+03

0.0000e+00 1.6000e+01 1.8800e+03 2.8550e+03]

[3.0000e+00 2.0000e+00 1.4100e+03 8.3840e+03 1.0000e+00 1.4100e+03

0.0000e+00 3.5000e+01 1.4100e+03 9.2050e+03]

[4.0000e+00 2.5000e+00 2.1630e+03 5.8820e+03 2.0000e+00 2.1630e+03

0.0000e+00 1.4000e+01 1.7600e+03 9.6000e+03]

[3.0000e+00 1.0000e+00 9.7000e+02 1.4850e+04 1.0000e+00 9.7000e+02

0.0000e+00 5.2000e+01 1.4100e+03 1.4850e+04]

[4.0000e+00 2.0000e+00 1.6700e+03 9.9870e+03 1.0000e+00 1.6700e+03

0.0000e+00 5.3000e+01 1.6400e+03 7.2800e+03]

[4.0000e+00 1.7500e+00 1.8900e+03 9.6230e+03 1.0000e+00 1.2900e+03

6.0000e+02 5.1000e+01 1.5100e+03 9.7110e+03]

[3.0000e+00 2.2500e+00 1.5900e+03 1.1745e+04 1.0000e+00 1.0900e+03

5.0000e+02 4.2000e+01 1.5400e+03 1.2530e+04]

[3.0000e+00 2.5000e+00 1.9700e+03 9.6070e+03 2.0000e+00 1.0900e+03

8.8000e+02 3.2000e+01 2.0200e+03 9.6080e+03]

[4.0000e+00 2.5000e+00 2.7700e+03 7.0000e+03 1.0000e+00 1.9400e+03

8.3000e+02 4.1000e+01 2.1400e+03 7.6840e+03]

[4.0000e+00 2.7500e+00 2.2400e+03 7.2000e+03 1.0000e+00 1.1400e+03

1.1000e+03 5.3000e+01 1.5800e+03 7.4160e+03]

[3.0000e+00 1.5000e+00 1.6000e+03 1.0548e+04 1.0000e+00 1.6000e+03

0.0000e+00 5.8000e+01 2.8800e+03 1.3609e+04]

[2.0000e+00 1.0000e+00 9.0000e+02 1.3531e+04 1.0000e+00 9.0000e+02

0.0000e+00 4.1000e+01 1.7670e+03 8.3080e+03]

[4.0000e+00 2.5000e+00 1.9340e+03 5.6770e+03 2.0000e+00 1.9340e+03

0.0000e+00 7.0000e+00 1.9190e+03 5.0490e+03]

[3.0000e+00 2.0000e+00 1.5600e+03 7.3520e+03 1.0000e+00 1.5600e+03

0.0000e+00 2.8000e+01 1.1200e+03 7.9500e+03]

[4.0000e+00 2.5000e+00 2.0680e+03 7.2420e+03 2.0000e+00 2.0680e+03

0.0000e+00 4.4000e+01 1.5600e+03 7.5240e+03]

[4.0000e+00 1.5000e+00 2.0700e+03 7.2450e+03 1.0000e+00 1.0600e+03

1.0100e+03 5.6000e+01 1.4500e+03 7.3500e+03]

[4.0000e+00 2.5000e+00 2.8460e+03 8.5377e+04 1.5000e+00 1.9760e+03

8.7000e+02 2.0000e+01 1.6960e+03 5.7934e+04]

[3.0000e+00 1.5000e+00 1.5600e+03 7.3000e+03 1.0000e+00 1.0400e+03

5.2000e+02 5.6000e+01 1.4600e+03 7.9100e+03]

[4.0000e+00 2.5000e+00 2.1810e+03 5.5210e+03 2.0000e+00 2.1810e+03

0.0000e+00 1.4000e+01 2.3330e+03 5.1430e+03]

[4.0000e+00 2.5000e+00 2.4000e+03 6.0780e+03 2.0000e+00 2.4000e+03

0.0000e+00 1.9000e+01 2.4060e+03 7.6420e+03]

[4.0000e+00 2.0000e+00 2.1300e+03 9.5790e+03 1.0000e+00 1.2500e+03

8.8000e+02 5.2000e+01 1.5900e+03 9.8000e+03]

[2.0000e+00 2.7500e+00 1.5900e+03 2.0917e+04 1.5000e+00 1.5900e+03

0.0000e+00 1.0000e+02 1.3100e+03 6.0000e+03]

[5.0000e+00 1.7500e+00 2.3200e+03 7.7000e+03 1.0000e+00 1.2900e+03

1.0300e+03 5.8000e+01 1.7400e+03 7.2100e+03]

[3.0000e+00 1.0000e+00 1.1400e+03 9.6390e+03 1.0000e+00 1.1400e+03

0.0000e+00 5.3000e+01 1.1400e+03 9.6390e+03]

[3.0000e+00 2.5000e+00 2.4970e+03 4.4000e+03 2.0000e+00 2.4970e+03

0.0000e+00 1.3000e+01 2.4340e+03 4.4000e+03]

[4.0000e+00 2.5000e+00 2.6200e+03 5.4570e+03 2.0000e+00 2.6200e+03

0.0000e+00 1.7000e+01 2.7400e+03 5.8160e+03]

[3.0000e+00 2.5000e+00 1.6000e+03 6.8480e+03 2.0000e+00 1.6000e+03

0.0000e+00 2.0000e+01 1.7000e+03 7.2100e+03]

[3.0000e+00 2.5000e+00 1.7200e+03 6.8470e+03 2.0000e+00 1.7200e+03

0.0000e+00 3.3000e+01 1.6100e+03 7.7900e+03]

[3.0000e+00 2.0000e+00 1.8500e+03 9.5500e+03 1.0000e+00 1.8500e+03

0.0000e+00 3.2000e+01 2.2500e+03 9.5500e+03]]

X\_train sqrt\_living

[[3.0000e+00 2.2500e+00 2.0700e+03 ... 4.6000e+01 1.8900e+03 7.5190e+03]

[3.0000e+00 3.0000e+00 2.2900e+03 ... 7.2000e+01 1.8900e+03 1.4143e+04]

[4.0000e+00 2.2500e+00 2.8100e+03 ... 6.1000e+01 2.0200e+03 1.6140e+04]

...

[4.0000e+00 1.5000e+00 1.3700e+03 ... 5.0000e+01 1.3700e+03 7.9000e+03]

[3.0000e+00 2.5000e+00 1.8300e+03 ... 1.6000e+01 2.4880e+03 4.9980e+03]

[3.0000e+00 1.0000e+00 1.2500e+03 ... 5.3000e+01 1.3000e+03 7.9200e+03]]

y\_test sqrt\_living

[[465000.]

[499160.]

[206000.]

[198000.]

[189950.]

[234950.]

[178500.]

[409000.]

[275000.]

[280000.]

[225000.]

[455000.]

[215000.]

[286000.]

[375900.]

[199900.]

[150000.]

[349950.]

[230000.]

[552900.]

[175000.]

[230000.]

[265000.]

[215500.]

[310000.]

[199129.]

[270000.]

[295000.]

[183500.]

[349500.]

[162500.]

[359000.]

[246000.]

[240000.]

[245000.]

[199500.]

[415000.]

[258000.]

[317500.]

[541500.]

[292500.]

[541800.]

[260000.]

[320000.]

[214100.]

[205000.]

[255000.]

[184000.]

[204700.]

[314950.]

[190000.]

[289000.]

[355000.]

[260000.]

[220000.]

[174000.]

[280000.]

[196440.]

[276000.]

[235000.]

[482000.]

[224000.]

[340000.]

[299000.]

[233000.]

[199950.]

[250000.]

[230000.]

[275000.]

[321500.]

[290000.]

[263000.]

[289000.]]

y\_train sqrt\_living

[[196000.]

[465000.]

[571500.]

[175000.]

[239950.]

[267000.]

[259900.]

[270000.]

[185900.]

[305000.]

[345500.]

[245000.]

[637000.]

[515000.]

[165000.]

[237000.]

[267500.]

[230000.]

[535000.]

[299000.]

[284200.]

[250000.]

[243000.]

[549950.]

[226500.]

[274950.]

[425000.]

[264500.]

[250000.]

[216000.]

[524225.]

[280000.]

[332000.]

[205000.]

[185000.]

[238000.]

[249900.]

[214000.]

[254999.]

[199950.]

[280000.]

[182500.]

[250000.]

[201700.]

[227000.]

[363000.]

[250000.]

[249900.]

[272000.]

[207000.]

[154000.]

[241000.]

[160000.]

[180000.]

[453000.]

[238000.]

[170000.]

[300000.]

[341780.]

[196500.]

[215000.]

[384000.]

[269500.]

[239950.]

[270000.]

[349950.]

[424000.]

[234950.]

[198000.]

[201000.]

[227000.]

[353500.]

[389000.]

[359500.]

[195000.]

[510000.]

[234000.]

[159000.]

[302000.]

[270500.]

[194250.]

[212000.]

[290000.]

[265000.]

[309000.]

[280000.]

[100000.]

[313100.]

[220000.]

[372000.]

[340000.]

[447500.]

[172500.]

[168000.]

[255000.]

[303000.]

[240000.]

[254950.]

[299000.]

[351000.]

[235245.]

[210500.]

[199000.]

[382450.]

[196000.]

[210000.]

[245000.]

[230000.]

[219000.]

[420000.]

[331210.]

[495000.]

[312891.]

[420000.]

[205000.]

[206000.]

[269950.]

[370000.]

[225000.]

[287000.]

[195000.]

[132500.]

[229950.]

[247000.]

[350000.]

[225000.]

[287600.]

[262500.]

[139000.]

[276000.]

[210000.]

[360000.]

[260000.]

[275000.]

[250000.]

[255000.]

[625000.]

[460000.]

[280000.]

[299950.]

[850000.]

[200000.]

[305000.]

[360000.]

[367300.]

[551870.]

[265000.]

[328000.]

[234500.]

[260000.]

[330000.]

[429000.]

[430000.]

[199900.]

[285000.]

[215000.]

[115000.]

[370000.]

[272000.]

[240000.]

[274900.]

[289950.]

[480000.]

[182500.]

[299900.]

[256000.]

[255000.]

[285000.]

[355000.]

[375000.]

[215000.]

[209000.]

[248000.]

[315000.]

[190000.]

[289000.]

[179900.]

[330000.]

[220000.]

[329500.]

[270000.]

[239950.]

[215000.]

[277500.]

[305000.]

[222400.]

[260000.]

[204900.]

[212500.]

[175000.]

[215000.]

[277950.]

[210000.]

[287500.]

[221000.]

[639900.]

[175000.]

[480000.]

[232000.]

[245000.]

[252000.]

[259000.]

[500000.]

[263400.]

[355000.]

[110000.]

[235000.]

[310000.]

[321000.]

[286950.]

[411000.]

[215500.]

[485000.]

[265000.]

[257000.]

[250600.]

[370228.]

[300000.]

[299950.]

[169100.]

[335000.]

[220000.]

[427000.]

[276000.]

[250000.]

[227950.]

[271920.]

[375500.]

[175000.]

[230000.]

[317000.]

[250000.]

[160000.]

[233000.]

[299999.]

[225000.]

[225000.]

[335000.]

[194820.]

[115000.]

[359000.]

[184000.]

[338500.]

[166000.]

[260000.]

[205000.]

[329995.]

[124500.]

[279000.]

[185000.]

[248000.]

[171500.]

[340000.]

[197000.]

[354450.]

[285000.]

[360000.]

[352000.]

[415000.]

[100000.]

[457000.]

[225000.]

[339000.]

[367950.]

[169000.]

[278000.]

[229500.]

[353000.]

[213550.]

[165000.]

[429000.]

[234950.]

[290000.]

[262000.]

[269950.]

[254000.]

[285000.]

[215000.]

[246900.]

[274000.]

[250000.]

[255000.]

[299000.]

[449888.]

[260000.]

[190848.]

[286651.]

[225000.]]

Plot the linear regression line for the Training Data Set

Plot the linear regression line for the Test Data Set

Predict the house prices for the test data set given above.

Score = 0.5748464550259902

Sample 1 : [[356786.4785045]]

Sample 2 : [[230942.83624628]]

Sample 3 : [[401641.6381213]]

Sample 4 : [[552778.60649677]]

Sample 5 : [[604735.83305289]]

Sample 6 : [[401641.6381213]]

Sample 7 : [[137494.58704462]]

Part (C): Use Multiple Linear Regression using all variables to predict the house price

Rsquare = 0.7358874912286378

Predict the house prices for the test data set given above.

Sample 1 : [[351776.90850075]]

Sample 2 : [[232511.52761214]]

Sample 3 : [[354803.95527509]]

Sample 4 : [[623561.34780133]]

Sample 5 : [[660784.66337465]]

Sample 6 : [[515283.45381946]]

Sample 7 : [[326042.61685196]]

Use Decision Tree Regression model to predict the house price

Rsquare = 0.5347858498116531

Predict the house prices for the test data set given above.

Sample 1 : [363000.]

Sample 2 : [215000.]

Sample 3 : [271500.]

Sample 4 : [637000.]

Sample 5 : [637000.]

Sample 6 : [524225.]

Sample 7 : [350000.]

Use Random Forest Regression model (use 10 Random Trees) to predict house price

Rsquare = 0.5347858498116531

Predict the house prices for the test data set given above.

Sample 1 : [441424.]

Sample 2 : [214500.]

Sample 3 : [327645.]

Sample 4 : [596000.]

Sample 5 : [618500.]

Sample 6 : [555600.]

Sample 7 : [265750.]

Random forest predictive model is the best because they have the highest r2\_score, which mean they give the better prediction.

Use Multiple Linear Regression Model to find the most important variables:

[[-7.88705902e+02]

[ 8.19231090e+03]

[ 6.09242090e+01]

[ 6.17027178e-01]

[ 9.69192484e+03]

[ 2.83403368e+01]

[ 3.25838722e+01]

[-4.54112958e+02]

[ 2.20893676e+01]

[ 2.48683264e+00]]

Sort the coef\_ list:

[[0 7 3 9 8 5 6 2 1 4]]

We can see bedroom, floors are the most important variables since they are the most negative and positive coef\_ .

Process finished with exit code 0