

Q5	Age	loan (million dollars)	HPI	BHK	Camlin Page	
					Date	Page
1	25	40	135	2	102.70	
2	35	60	256	3	82.02	
3	45	80	231	3	62.51	
4	20	20	267	4	123.17	
5	35	120	139	4	22.09	
6	52	18	150	2	124.90	
7	23	95	127	2	49.64	
8	40	62	216	4	80.05	
9	60	100	139	2	47.88	
10	48	220	250	3	78.77	
11	33	150	264	4	8.94	
12	37	142	?	?		

NOTE: We will be using euclidean distances for computation: $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

Calculating distances

$$① \sqrt{(37-25)^2 + (142-40)^2} = 102.70$$

$$② \sqrt{(37-35)^2 + (142-60)^2} = 82.02$$

$$③ \sqrt{(37-45)^2 + (142-80)^2} = 62.51$$

$$④ \sqrt{(37-20)^2 + (142-20)^2} = 123.17$$

$$⑤ \sqrt{(2)^2 + (22)^2} = 22.09$$

$$⑥ \sqrt{15^2 + 124^2} = 124.90$$

$$⑦ \sqrt{14^2 + 47^2} = 49.64$$

$$⑧ \sqrt{3^2 + 80^2} = 80.05$$

$$⑨ \sqrt{23^2 + 42^2} = 47.88$$

$$⑩ \sqrt{11^2 + 78^2} = 78.77$$

$$⑪ \sqrt{4^2 + 8^2} = 8.94$$

R=1

⑪ 33 150 ~~264~~ ④

Since highest frequency = 4, hence BHK = 4

Average value of HPI of 1 nearest neighbour = 264 \Rightarrow HPI = 264

Predicted entry:

⑫ 37 142 264 4

R=2

The 2 nearest are:

⑪ 33 150 264 4 8.94

⑤ 35 120 139 4 22.09

BHK Since discrete \therefore we count freq.
Since BHK = 4 is most frequent
hence \rightarrow BHK = 4

HPI Since HPI is a continuous value \therefore
we compute average of KNN = $\frac{264+139}{2} = 201.5$

\Rightarrow ⑫ 37 142 201.5 4

When $k=3$

2 nearest neighbours are:

	<u>Age</u>	<u>Loan</u>	<u>HPI</u>	<u>BHK</u>	
⑪	33	150	264	4	8.94
⑤	35	120	139	4	22.09
⑨	60 ₅	100	129	2	47.28

BHK \rightarrow discrete \rightarrow frequency count \Rightarrow 4^{||} (frequency 2)

HPI \rightarrow continuous \rightarrow average value $\Rightarrow \frac{264 + 139 + 139}{3} = 180.66$

\Rightarrow predicted

Age⁰ = 37

Loan = 112

HPI = 180.66

BHK = 4