IQR Assignment

a. The interquartile range. Compare the two interquartile ranges.

b. Any outliers in either set.

The five number summary for the day and night classes is

	Minimum	Q_1	Median	Q_3	Maximum
Day	32	56	74.5	82.5	99
Night	25.5	78	81	89	98

DAY:

IQR:

IQR = Q3 - Q1

IQR = 82.5 - 56

IQR = 26.5

Lesser value:

Less than outlier range = Q1 - 1.5 * IQR

Less than outlier range = 56 - 1.5 * 26.5

Less than outlier range = 16.25

Greater value:

Greater than outlier range = Q3 + 1.5 * IQR

Greater than outlier range = 82.5 + 1.5 * 26.5

Greater than outlier range = 122.25

Night:

IQR:

IQR = Q3 - Q1

IQR = 89 - 78

IQR = 11

Lesser value:

Less than outlier range = Q1 - 1.5 * IQR

Less than outlier range = 78 - 1.5 * 11

Less than outlier range = 61.5

Greater value:

Greater than outlier range = Q3 + 1.5 * IQR

Greater than outlier range = 89 + 1.5 * 11

Greater than outlier range = 105.5

Summary:

1. The **Day class** has a significantly larger **interquartile range (26.5)** compared to the **Night class (11)**, indicating more variability in the **middle 50%** of the **data** for the **Day class**.
2. **Data Range:** 32 to 99
   → **No outliers were found in the Day class.** (since all values are within [16.25, 122.25])
3. **Data Range:** 25.5 to 98
   → **The Night class has one outlier**: **25.5** is less than 61.5, so it's an outlier.

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	sl_no	ssc_p	hsc_p	degree_p	etest_p	mba_p	salary
Mean	108.0	67.303395	66.333163	66.370186	72.100558	62.278186	288655.405405
Median	108.0	67.0	65.0	66.0	71.0	62.0	265000.0
Mode	1	62.0	63.0	65.0	60.0	56.7	300000.0
Q1:25%	54.5	60.6	60.9	61.0	60.0	57.945	240000.0
Q2:50%	108.0	67.0	65.0	66.0	71.0	62.0	265000.0
Q3:75%	161.5	75.7	73.0	72.0	83.5	66.255	300000.0
99%	212.86	87.0	91.86	83.86	97.0	76.1142	NaN
Q4:100%	215.0	89.4	97.7	91.0	98.0	77.89	940000.0
IQR	107.0	15.1	12.1	11.0	23.5	8.31	60000.0
1.5rule	160.5	22.65	18.15	16.5	35.25	12.465	90000.0
Lesser	-106.0	37.95	42.75	44.5	24.75	45.48	150000.0
Greater	322.0	98.35	91.15	88.5	118.75	78.72	390000.0
Min	1	40.89	37.0	50.0	50.0	51.21	200000.0
Max	215	89.4	97.7	91.0	98.0	77.89	940000.0

Summary:

1. IQR:

1. Salary has the highest variability in actual value terms (₹60,000 IQR).
2. mba_p has the lowest spread (IQR = 8.31), indicating most MBA scores are close together.

2. Outlier Analysis:

1. **hsc_p:**

   → **One lower outlier** — Min = 37.0 is less than the lesser value (42.75), so it's an outlier.

2. **hsc_p, degree_p, salary: (Three upper outliers)**

   → **hsc_p** — Max = 97 exceeds the greater value (91.15), so it's an outlier.

   → **degree_p** — Max = 91 exceeds the greater value (88.5), so it's an outlier.

   → **salary** — Max = ₹940,000 exceeds the greater value (₹390,000), so it's an outlier.

3. Variables with No Outliers:

1. ssc_p, etest_p, mba_p

   → All values fall within their respective IQR bounds.
