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Project 10: Compensation Analytics (v1

Objective:
Analyze synthetic HR Compensation dataset to extract key insights: pay distribution, gender pay and bonus allocation.

Business Context:
Compensation & Benefits (C&B) analytics helps HR leaders answer:

- Are we paying fairly across levels, genders, departments?
- How are bonuses distributed?
- Where are the gaps or outliers that need intervention?

This notebook covers:

1. Load & explore dataset
2. Core metrics (Avg/Median CTC)
3. Bonus % analysis
4. Gender pay gap
5. Visuals (CTC by level, gender gap, bonus distribution)
6. Export artifacts

```
✅ Synthetic dataset created at data/employee_compensation_sample.csv
```

Out[4]:

	EmployeeID	Gender	JobLevel	Department	CTC	Bonus
0	1	Male	3	Finance	1547021.0	282053
1	2	Female	3	Tech	1358290.8	148077
2	3	Female	2	Ops	666574.2	116104
3	4	Male	4	Sales	2095627.0	352394
4	5	Male	3	Ops	1612363.0	231638

```
Data Shape: (500, 6)
```

Out[5]:

	EmployeeID	Gender	JobLevel	Department	CTC	Bonus
0	1	Male	3	Finance	1547021.0	282053
1	2	Female	3	Tech	1358290.8	148077
2	3	Female	2	Ops	666574.2	116104
3	4	Male	4	Sales	2095627.0	352394
4	5	Male	3	Ops	1612363.0	231638
5	6	Male	1	Sales	271556.0	33719
6	7	Male	5	HR	3040305.0	598735
7	8	Female	4	Sales	1824920.1	130928
8	9	Female	5	Finance	2750918.4	436772
9	10	Female	3	Tech	1419860.7	111712

Out[6]:

Gender	Department	Female	Male	
0	Finance	1.128955e+06	1.078214e+06	-4.7060
1	HR	1.177926e+06	1.396499e+06	15.6515
2	Ops	1.176087e+06	1.119096e+06	-5.0925
3	Sales	9.392308e+05	1.385500e+06	32.2099
4	Tech	1.285262e+06	1.421261e+06	9.5688

```
Average CTC: ₹ 12.18 Lakhs
Median CTC: ₹ 8.88 Lakhs
```

Out[8]:

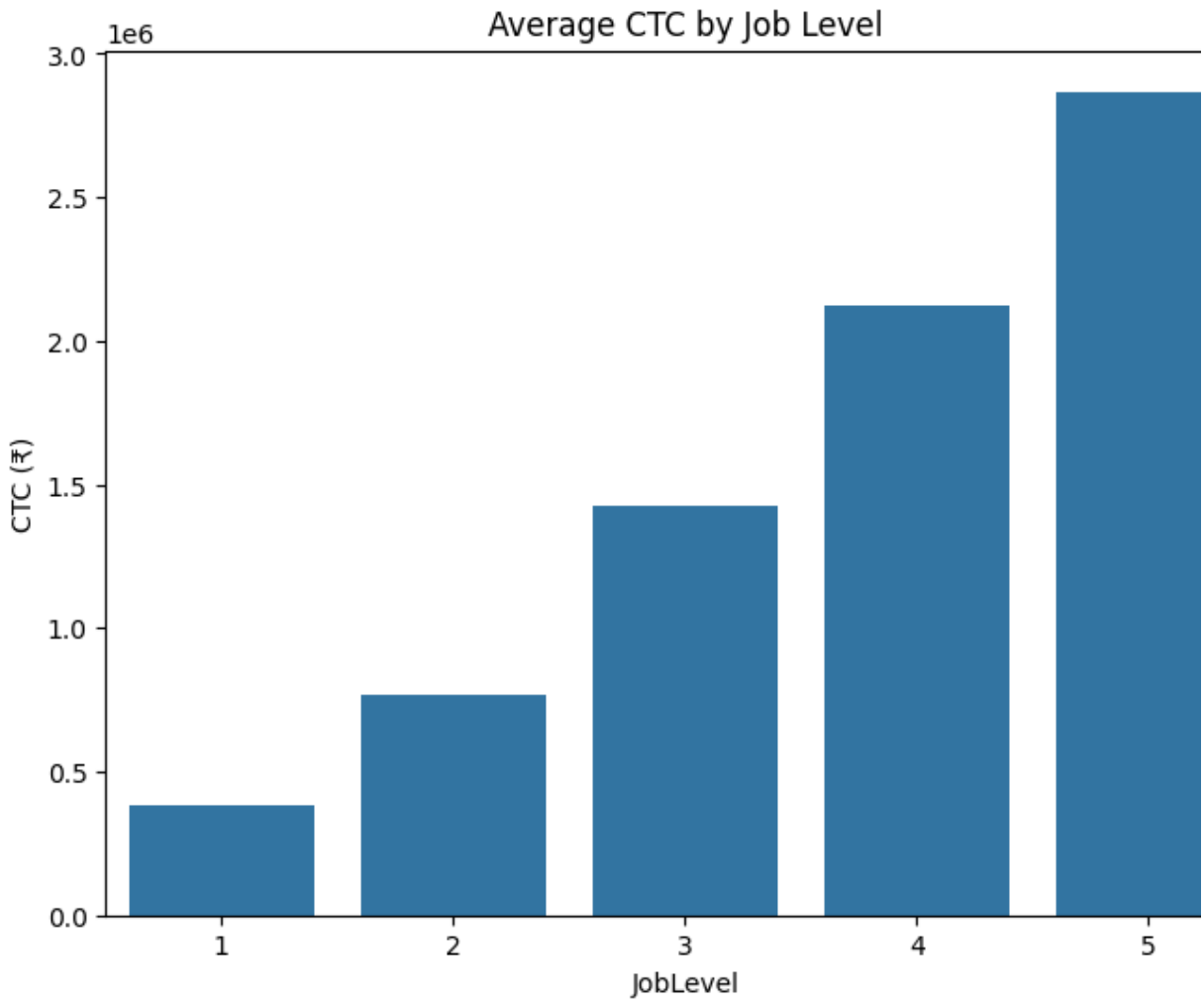
	Department	mean	median
0	Finance	1.102303e+06	833456.00
1	HR	1.315315e+06	997444.00
2	Ops	1.137180e+06	830957.50
3	Sales	1.176311e+06	844169.50
4	Tech	1.360345e+06	1360233.45

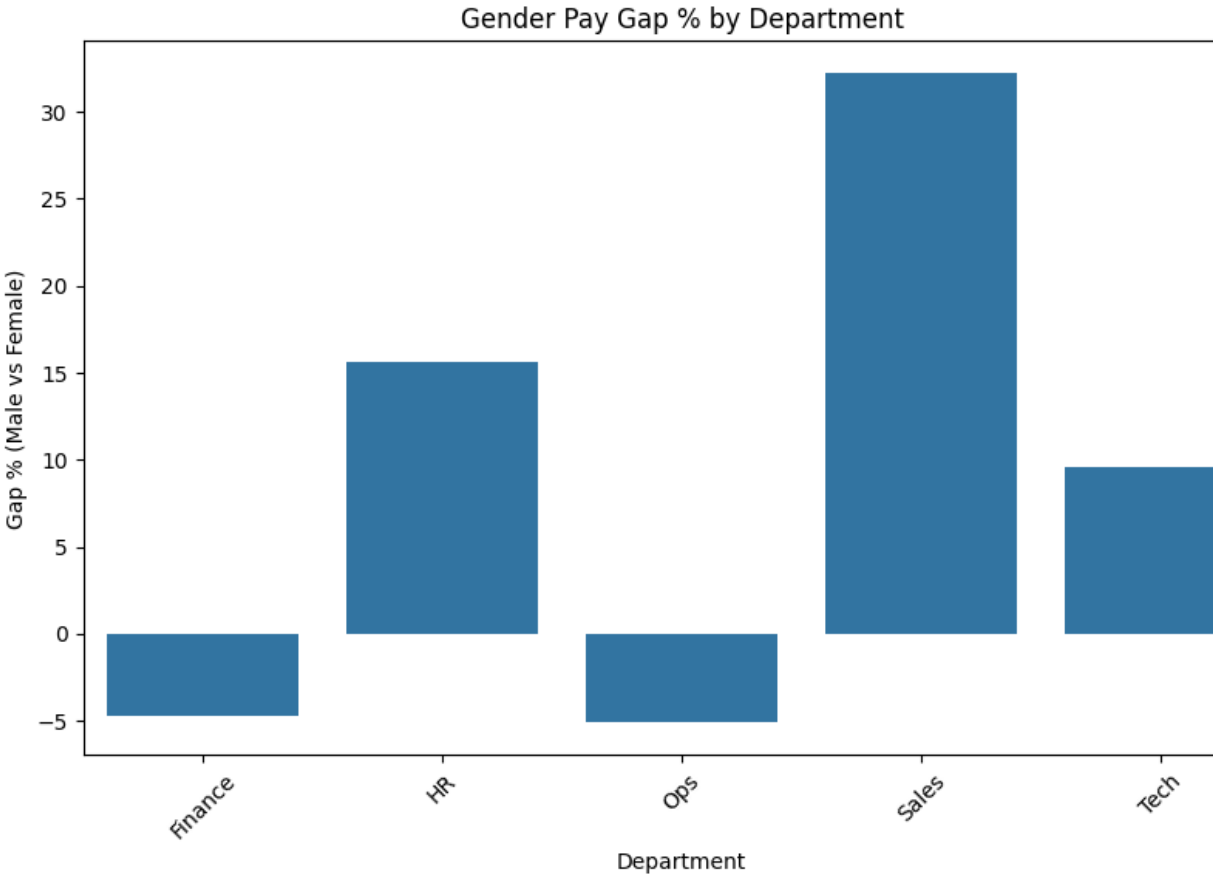
Out[9]:

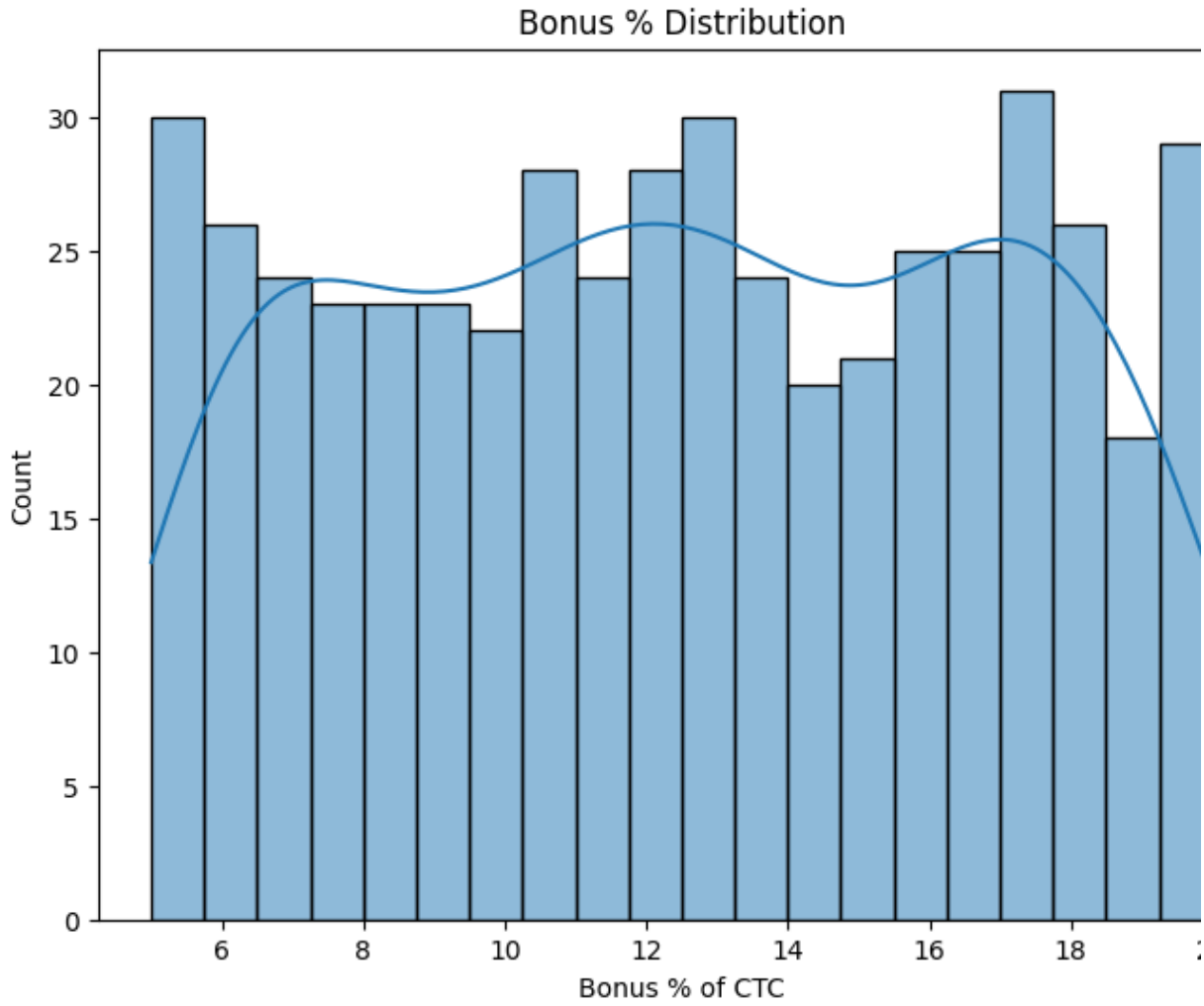
	EmployeeID	CTC	Bonus	Bonus %
434	435	380464.0	76076	19.995584
106	107	742650.0	148204	19.956103
483	484	310128.3	61845	19.941747
409	410	1010006.0	201222	19.922852
153	154	1444729.0	287156	19.876115

Out[10]:

Gender	Department	Female	Male	
0	Finance	1.128955e+06	1.078214e+06	-4.7060
1	HR	1.177926e+06	1.396499e+06	15.6515
2	Ops	1.176087e+06	1.119096e+06	-5.0925
3	Sales	9.392308e+05	1.385500e+06	32.2099
4	Tech	1.285262e+06	1.421261e+06	9.5688




Gender Pay Gap % by Department
Gap % (Male vs Female)
30
25
20
15
10
5
0
−5
Finance
HR
Ops
Sales
Tech
Department


Bonus % Distribution
Count
30
25
20
15
10
5
0
6
8
10
12
14
16
18
Bonus % of CTC

```
✅ Artifacts generated:
- data/Comp_Analytics_Processed.csv
- images/comp_ctc_by_joblevel.png
- images/comp_gender_gap.png
- images/comp_bonus_dist.png
```

✅ Conclusions

- **Average CTC:** X Lakhs, **Median CTC:** Y Lakhs
- **By Level:** Pay rises steadily with seniority.
- **By Gender:** Gap of Z% in Dept A (highest disparity).
- **Bonuses:** Top 10% employees capture ~__% of total bonus pool.

📓 Notebook: Compensation_Analytics_V1.ipynb