



## Data Table:

資料集為飯店的訂房資訊，統計了:成人人數、孩童人數、平日晚上數、假日晚上數、平均房價、餐食選擇(Target)

	room_type	n_adults	n_children	weekend_nights	week_nights	meal_plan	avg_room_price
1	Room_Type 1	2	0	1	2	Meal Plan 1	65.00
2	Room_Type 1	2	0	2	3	Not Selected	106.68
3	Room_Type 1	1	0	2	1	Meal Plan 1	60.00
4	Room_Type 1	2	0	0	2	Meal Plan 1	100.00
5	Room_Type 1	2	0	1	1	Not Selected	94.50
6	Room_Type 1	2	0	0	2	Meal Plan 2	115.00
7	Room_Type 1	2	0	1	3	Meal Plan 1	107.55
8	Room_Type 4	2	0	1	3	Meal Plan 1	105.61
9	Room_Type 1	3	0	0	4	Meal Plan 1	96.90
10	Room_Type 4	2	0	0	5	Meal Plan 1	133.44
11	Room_Type 1	1	0	1	0	Not Selected	85.03
12	Room_Type 4	1	0	2	1	Meal Plan 1	140.40
13	Room_Type 1	2	0	2	1	Not Selected	88.00
14	Room_Type 1	1	0	2	0	Meal Plan 1	90.00
15	Room_Type 1	2	0	0	2	Meal Plan 1	94.50
16	Room_Type 1	2	0	0	2	Meal Plan 2	115.00
17	Room_Type 1	1	0	1	0	Meal Plan 1	96.00
18	Room_Type 1	2	0	1	3	Not Selected	96.00
19	Room_Type 1	2	0	2	2	Meal Plan 1	65.00
20	Room_Type 1	2	0	1	0	Meal Plan 1	72.00
21	Room_Type 1	2	0	2	2	Meal Plan 1	65.00
22	Room_Type 1	1	0	0	1	Meal Plan 1	67.00
23	Room_Type 1	2	0	2	4	Meal Plan 1	85.00
24	Room_Type 1	2	0	0	3	Meal Plan 1	105.00
25	Room_Type 1	2	0	2	1	Not Selected	94.50
26	Room_Type 1	2	0	0	2	Meal Plan 1	114.30
27	Room_Type 1	2	0	1	1	Meal Plan 1	65.00
28	Room_Type 4	1	0	0	2	Meal Plan 1	110.00
29	Room_Type 1	1	0	1	2	Meal Plan 1	37.33
30	Room_Type 1	2	0	0	2	Meal Plan 2	82.00
31	Room_Type 4	2	0	1	1	Meal Plan 1	177.50

## Test and Score:

Evaluation results for target (None, show average over classes)						
Model	AUC	CA	F1	Prec	Recall	MCC
kNN	0.879	0.861	0.852	0.850	0.861	0.597
Random Forest	0.906	0.874	0.868	0.866	0.874	0.641
Gradient Boosting	0.900	0.865	0.848	0.857	0.865	0.593

Confusion Matrix:

KNN:

		Predicted							Σ
		Room_Type 1	Room_Type 2	Room_Type 3	Room_Type 4	Room_Type 5	Room_Type 6	Room_Type 7	
Actual	Room_Type 1	26547	83	0	1431	15	53	1	28130
	Room_Type 2	460	173	0	35	0	21	3	692
	Room_Type 3	7	0	0	0	0	0	0	7
	Room_Type 4	2291	26	0	3705	10	24	1	6057
	Room_Type 5	165	1	0	57	34	7	1	265
	Room_Type 6	116	7	0	64	3	764	12	966
	Room_Type 7	54	3	0	27	0	60	14	158
Σ		29640	293	0	5319	62	929	32	36275

Random Forest:

		Predicted							Σ
		Room_Type 1	Room_Type 2	Room_Type 3	Room_Type 4	Room_Type 5	Room_Type 6	Room_Type 7	
Actual	Room_Type 1	26622	94	0	1330	30	51	3	28130
	Room_Type 2	300	315	0	49	2	24	2	692
	Room_Type 3	6	0	0	1	0	0	0	7
	Room_Type 4	2083	42	0	3879	16	29	8	6057
	Room_Type 5	130	2	0	65	58	7	3	265
	Room_Type 6	80	10	0	61	3	794	18	966
	Room_Type 7	53	3	0	18	1	47	36	158
Σ		29274	466	0	5403	110	952	70	36275

Gradient Boosting:

		Predicted							Σ
		Room_Type 1	Room_Type 2	Room_Type 3	Room_Type 4	Room_Type 5	Room_Type 6	Room_Type 7	
Actual	Room_Type 1	27453	11	0	612	27	23	4	28130
	Room_Type 2	467	192	0	5	0	23	5	692
	Room_Type 3	7	0	0	0	0	0	0	7
	Room_Type 4	3155	3	0	2860	11	20	8	6057
	Room_Type 5	158	2	0	45	52	6	2	265
	Room_Type 6	82	4	0	60	6	790	24	966
	Room_Type 7	45	3	0	27	3	44	36	158
Σ		31367	215	0	3609	99	906	79	36275