payment

| (A)<br>flight_id | (B)<br>customer_id | (C)<br>card_type | (D)<br>card_no | (E)<br>book_date |
|---|---|---|---|---|
| 102 | 1 | VISA | 5235 758 | 04.05.2021 |
| 329 | 2 | MASTER | 5891 345 | 04.06.2001 |
| 507 | 3 | VISA | 4331 001 | 04.06.2021 |
| 102 | 4 | VISA | 7891 225 | 04.06.2021 |
| 329 | 5 | MASTER | 1214 262 | 04.05.2021 |
| 507 | 6 | VISA | 0001234 | 04.05.2021 |
| 329 | 7 | VISA |  |  |

(1NF)

F:
flight_id → card_type, book_date
flight_id, customer_id → card_no
card_type → card_no

Fc: $(flight\_id)^+$ = flight_id, card_type, book_date ($R_1$)
$(flight\_id, customer\_id)^+$ = flight_id, customer_id, card_no ($R_2$)
$(card\_type)^+$ = card_type, card_no ($R_3$)

2NF:
FLIGHT_BES ( flight_id, card_type, book_date )
FLIGHT_CUS ( flight_id, customer_id, card_no )
CARD ( card_type, card_no )

$R_1 \cap R_2$ = { flight_id }        $(flight\_id)^+$ = flight_id, card_type, book_date (dependency) (as ...
$R_1 \cap R_3$ = { card_type }       $(card\_type)^+$ = flight_id, customer_id, card_no (dependency) (as ...
$R_2 \cap R_3$ = { card_no }
→ not dependency!

BCNF:
F:    A → CE
      AB → D
      C → D

$F^+$:   $A^+$ = ACE          → Since I can reach D from;
        $AB^+$ = A(B)D            A→CE  and  AB→D
        $C^+$ = CD

→ so I don't need C→D relation. Thus BCNF is;

flight_id → card_type, book_date
(flight_id, customer_id) → card_no