

### Assignment #3

Muzhe Peng 6603646 2019124040

Wangzhihui Mei 6603385 2019124044

Yiwen Zhao 6603749 2019124038

[CHAR]

Dinning67

DishId : N1

DishName == seq CHAR

Price == N1

DISH == DishId  $\times$  DishName  $\times$  Price

OrderId : N1

TableId : N1

Status ::= Ordered | Preparing | Served | Cancelled

Quantity : N

OrderRef : N1

DishRef : N1

ORDERITEM == OrderRef  $\times$  DishRef  $\times$  Quantity  $\times$  Status

ORDERITEMS :  $\mathbb{P}$  ORDERITEM

ORDER == OrderId  $\times$  TableId  $\times$  ORDERITEMS

order\_status : OrderId  $\rightarrow$  Status

order\_detail : OrderId  $\leftrightarrow$  ORDERITEMS

order\_dish\_ref : OrderId  $\leftrightarrow$  DishRef

OrderRef  $\subseteq$  OrderId

DishRef  $\subseteq$  DishId

InitDinning67

Dinning67

ORDER =  $\emptyset$

AddDishesOK

$\Delta$  Dinning67

oid? : OrderId

tid? : TableId

d? : DishRef

r! : seq CHAR

oid  $\in$  dom order\_status

order\_status oid = Ordered

order\_dish\_ref' oid? = order\_dish\_ref oid?  $\cup$  {d?}

r! = "You have successfully added dishes!"

DeleteDishesOK	
$\Delta$ Dinning67	
oid? : OrderId	
tid? : TableId	
d? : DishRef	
r! : seq CHAR	
oid $\in$ dom order_status	
order_status oid = Ordered	
order_dish_ref' oid? = order_dish_ref oid? \ {d?}	
r! = "You have successfully deleted dishes!"	

ModifyDishesFail	
$\exists$ Dinning67	
oid? : OrderId	
tid? : TableId	
d? : DishRef	
r! : seq CHAR	
oid $\notin$ dom order_status $\vee$ order_status oid $\in$ Status \ {Ordered}	
order_status' = order_status	
order_detail' = order_detail	
order_dish_ref' = order_dish_ref	
r! = "Modification failed!"	

ModifyDishes  $\triangleq$  AddDishesOK  $\vee$  DeleteDishesOK  $\vee$  ModifyDishesFail

PlaceOrders	
$\Delta$ Dinning67	
oid? : OrderId	
tid? : TableId	
ot? : ORDERITEM	
r! : seq CHAR	
ORDER' = ORDER $\cup$ (oid? $\times$ tid? $\times$ oit?)	
order_status oid = Ordered	
r! = "The order now is being placed!"	

PrepareDishes	
$\Delta$ Dinning67	
oid? : OrderId	
r! : seq CHAR	
order_status oid = Preparing	
order_detail' = order_detail	
order_dish_ref' = order_dish_ref	
r! = "The order now is being prepared!"	

ServeDishes	
ΔDinning67	
oid? : OrderId	
tid? : TableId	
r! : seq CHAR	
order_status oid = Served	
order_detail '= order_detail	
order_dish_ref '= order_dish_ref	
r! = "The order now is being served!"	