

```

;;;;;;;;;;;;;;
;;;
;;; Inference Rules (For importance, higher values go first.) ;;
;;; Domain: American Food Specific ;;
;;;
;;;
;;;
;;; Meal Type

(defrule full-meal-american (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user american]
       [or [meal ?user lunch]
            [meal ?user dinner]]]
  then [full-meal-american ?user yes])

(defrule dessert-meal-american (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user american]
       [meal ?user dessert]]
  then [dessert-meal-american ?user yes])

(defrule full-meal-american-exclusion (:forward :certainty 1.0 :importance 90)
  if [full-meal-american ?user yes]
  then [and [dessert-meal-american ?user no]
        [having-dessert ?user no]])

(defrule dessert-meal-american-exclusion (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user american]
       [meal ?user dessert]]
  then [full-meal-american ?user no])

;;; Figure out meat

;;; General selection

(defrule meat-type-healthy-american (:backward :certainty 1.0 :importance 96)
  if [and [food-ethnicity ?user american]
       [full-meal-american ?user yes]
       [health-conscious ?user yes]]
  then [meat-american-round1 ?user poultry/seafood])

(defrule meat-type-not-healthy-american (:backward :certainty 1.0 :importance 95)
  if [and [food-ethnicity ?user american]
       [full-meal-american ?user yes]
       [health-conscious ?user no]]
  then [meat-american-round1 ?user pork/beef])

;;; final selection

(defrule bbq-american (:backward :certainty 1.0 :importance 94)
  if [and [food-ethnicity ?user american]
       [full-meal-american ?user yes]
       [meat-american-round1 ?user pork/beef]
       [is-south ?user yes]
       [is-summer ?user yes]
       [use-bbq-sauce ?user yes]]
  then [final-meat ?user BBQ])

(defrule beef-american (:backward :certainty 1.0 :importance 93)
  if [and [food-ethnicity ?user american]
       [full-meal-american ?user yes]]

```

```

[meat-american-round1 ?user pork/beef]
[is-midwest ?user yes]]
then [beef ?user yes])

(defrule beef-american-no (:backward :certainty 1.0 :importance 93)
if [and [food-ethnicity ?user american]
      [full-meal-american ?user yes]
      [meat-american-round1 ?user pork/beef]
      [is-midwest ?user no]]
then [beef ?user no])

(defrule beef-american-no-2 (:backward :certainty 1.0 :importance 93)
if [and [food-ethnicity ?user american]
      [full-meal-american ?user yes]
      [meat-american-round1 ?user poultry/seafood]]
then [beef ?user no])

(defrule seafood-american (:backward :certainty 1.0 :importance 92)
if [and [food-ethnicity ?user american]
      [full-meal-american ?user yes]
      [meat-american-round1 ?user poultry/seafood]
      [is-near-coast ?user yes]]
then [seafood ?user yes])

(defrule seafood-american-no (:backward :certainty 1.0 :importance 92)
if [and [food-ethnicity ?user american]
      [full-meal-american ?user yes]
      [meat-american-round1 ?user poultry/seafood]
      [is-near-coast ?user no]]
then [seafood ?user no])

(defrule seafood-american-no2 (:backward :certainty 1.0 :importance 92)
if [and [food-ethnicity ?user american]
      [full-meal-american ?user yes]
      [meat-american-round1 ?user pork/beef]]
then [seafood ?user no])

(defrule poultry-american (:backward :certainty 1.0 :importance 91)
if [and [food-ethnicity ?user american]
      [full-meal-american ?user yes]
      [meat-american-round1 ?user poultry/seafood]
      [is-near-coast ?user no]]
then [poultry ?user yes])

(defrule poultry-american-no (:backward :certainty 1.0 :importance 91)
if [and [food-ethnicity ?user american]
      [full-meal-american ?user yes]
      [meat-american-round1 ?user poultry/seafood]
      [is-near-coast ?user yes]]
then [poultry ?user no])

(defrule poultry-american-no2 (:backward :certainty 1.0 :importance 91)
if [and [food-ethnicity ?user american]
      [full-meal-american ?user yes]
      [meat-american-round1 ?user pork/beef]]
then [poultry ?user no])

```

;;;;;;;;;;;;;;;
;;;

```

;;; Inference Rules (For importance, higher values go first.) ;;
;;; Domain: Caribbean Food Specific ;;
;;;
:::::::::::;

;;; Meal Type

(defrule full-meal-caribbean (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user caribbean]
       [or [meal ?user lunch]
           [meal ?user dinner]]]
  then [full-meal-caribbean ?user yes])

(defrule dessert-meal-caribbean (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user caribbean]
       [meal ?user dessert]]
  then [dessert-meal-caribbean ?user yes])

(defrule full-meal-caribbean-exclusion (:forward :certainty 1.0 :importance 90)
  if [full-meal-caribbean ?user yes]
  then [and [dessert-meal-caribbean ?user no]
         [having-dessert ?user no]])

(defrule dessert-meal-caribbean-exclusion (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user caribbean]
       [meal ?user dessert]]
  then [full-meal-caribbean ?user no])

;;; Figure out meat

;;; General selection

(defrule meat-type-healthy-caribbean (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]
       [full-meal-caribbean ?user yes]
       [health-conscious ?user yes]]
  then [meat-caribbean-round1 ?user poultry/seafood])

(defrule meat-type-not-healthy-caribbean (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]
       [full-meal-caribbean ?user yes]
       [health-conscious ?user no]]
  then [meat-caribbean-round1 ?user pork/beef])

;;; final selection

(defrule pork-caribbean (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]
       [meat-caribbean-round1 ?user pork/beef]
       [is-expensive ?user yes]]
  then [pork ?user yes])

(defrule pork-caribbean-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]
       [meat-caribbean-round1 ?user pork/beef]
       [is-expensive ?user no]]
  then [pork ?user no])

(defrule pork-caribbean-no2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]

```

```

[meat-caribbean-round1 ?user poultry/seafood]]
then [pork ?user yes])

(defrule beef-caribbean (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]
        [meat-caribbean-round1 ?user pork/beef]
        [is-expensive ?user no]]
  then [beef ?user yes])

(defrule beef-caribbean-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]
        [meat-caribbean-round1 ?user pork/beef]
        [is-expensive ?user yes]]
  then [beef ?user no])

(defrule beef-caribbean-no2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]
        [meat-caribbean-round1 ?user poultry/seafood]]
  then [beef ?user no])

(defrule seafood-caribbean (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]
        [meat-caribbean-round1 ?user poultry/seafood]
        [is-near-coast ?user yes]]
  then [seafood ?user yes])

(defrule seafood-caribbean-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]
        [meat-caribbean-round1 ?user poultry/seafood]
        [is-near-coast ?user no]]
  then [seafood ?user no])

(defrule seafood-caribbean-no2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]
        [meat-caribbean-round1 ?user pork/beef]]
  then [seafood ?user no])

(defrule poultry-caribbean (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]
        [meat-caribbean-round1 ?user poultry/seafood]
        [is-near-coast ?user no]]
  then [poultry ?user yes])

(defrule poultry-caribbean-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]
        [meat-caribbean-round1 ?user poultry/seafood]
        [is-near-coast ?user yes]]
  then [poultry ?user no])

(defrule poultry-caribbean-no2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user caribbean]
        [meat-caribbean-round1 ?user pork/beef]]
  then [poultry ?user no])

;;;;;;;;;;;;;;;;;;;;
;;
;; Inference Rules (For importance, higher values go first.) ;;
;; Domain: Italian Food Specific ;;
;;
;
```

```

;;; Meal Type

(defrule full-meal-italian (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user italian]
       [or [meal ?user lunch]
           [meal ?user dinner]]]
  then [full-meal-italian ?user yes])

(defrule dessert-meal-italian (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user italian]
       [meal ?user dessert]]
  then [dessert-meal-italian ?user yes])

(defrule full-meal-italian-exclusion (:forward :certainty 1.0 :importance 90)
  if [full-meal-italian ?user yes]
  then [and [dessert-meal-italian ?user no]
        [having-dessert ?user no]])

(defrule dessert-meal-italian-exclusion (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user italian]
       [meal ?user dessert]]
  then [full-meal-italian ?user no])

(defrule vegetarian (:backward :certainty 1.0 :importance 10)
  if [is-vegetarian ?user yes]
  then [cheese-meal-italian ?user yes])

;;; Figure out meat

;;; General selection

(defrule meat-type-healthy-italian (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user italian]
       [full-meal-italian ?user yes]
       [health-conscious ?user yes]]
  then [seafood/poultry-italian ?user yes])

(defrule meat-type-healthy-italian-no1 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user italian]
       [full-meal-italian ?user yes]
       [health-conscious ?user no]]
  then [seafood/poultry-italian ?user no])

;;; final selection

(defrule meat-type-not-healthy-italian (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user italian]
       [full-meal-italian ?user yes]
       [health-conscious ?user no]]
  then [beef ?user yes])

(defrule meat-type-not-healthy-italian-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user italian]
       [full-meal-italian ?user yes]
       [health-conscious ?user yes]]
  then [beef ?user no])

(defrule seafood-italian (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user italian]

```

```

[seafood/poultry-italian ?user yes]
[is-near-coast ?user yes]]
then [seafood ?user yes])

(defrule seafood-italian-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user italian]
       [seafood/poultry-italian ?user yes]
       [is-near-coast ?user no]]
  then [seafood ?user no])

(defrule poultry-italian (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user italian]
       [seafood/poultry-italian ?user yes]
       [is-near-coast ?user no]]
  then [poultry ?user yes])

(defrule poultry-italian-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user italian]
       [seafood/poultry-italian ?user yes]
       [is-near-coast ?user yes]]
  then [poultry ?user no])

;;; ethnicity specific

(defrule cheese-italian (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user italian]
       [full-meal-italian ?user yes]
       [lactose-tolerant ?user yes]]
  then [has-cheese ?user yes])

(defrule cheese-italian-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user italian]
       [full-meal-italian ?user yes]
       [lactose-tolerant ?user no]]
  then [has-cheese ?user no])

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;;
;;;  Inference Rules (For importance, higher values go first.) ;;
;;;  Domain: Mexican Food Specific ;;
;;;
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;;
;;; Meal Type

(defrule full-meal-mexican (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user mexican]
       [or [meal ?user lunch]
           [meal ?user dinner]]]
  then [full-meal-mexican ?user yes])

(defrule dessert-meal-mexican (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user mexican]
       [meal ?user dessert]]
  then [dessert-meal-mexican ?user yes])

(defrule full-meal-mexican-exclusion (:forward :certainty 1.0 :importance 90)
  if [full-meal-mexican ?user yes]
  then [and [dessert-meal-mexican ?user no]
        [having-dessert ?user no]])

```

```

(defrule dessert-meal-mexican-exclusion (:backward :certainty 1.0 :importance 91)
  if [and  [food-ethnicity ?user mexican]
      [meal ?user dessert]]
  then [full-meal-mexican ?user no])

;;; Figure out meat

;;; General selection

(defrule meat-type-healthy-mexican (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user mexican]
      [full-meal-mexican ?user yes]
      [health-conscious ?user yes]]
  then [poultry ?user yes])

(defrule meat-type-healthy-mexican-no (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user mexican]
      [full-meal-mexican ?user yes]
      [health-conscious ?user no]]
  then [poultry ?user no])

(defrule meat-not-type-healthy-mexican (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user mexican]
      [full-meal-mexican ?user yes]
      [health-conscious ?user no]]
  then [meat-mexican-round1 ?user pork/beef])

;;; final selection

(defrule meat-not-type-healthy-mexican-beef (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user mexican]
      [full-meal-mexican ?user yes]
      [meat-mexican-round1 ?user pork/beef]
      [is-expensive ?user yes]]
  then [beef ?user yes])

(defrule meat-not-type-healthy-mexican-beef-no (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user mexican]
      [full-meal-mexican ?user yes]
      [meat-mexican-round1 ?user pork/beef]
      [is-expensive ?user no]]
  then [beef ?user no])

(defrule meat-not-type-healthy-mexican-pork (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user mexican]
      [full-meal-mexican ?user yes]
      [meat-mexican-round1 ?user pork/beef]
      [is-expensive ?user no]]
  then [pork ?user yes])

(defrule meat-not-type-healthy-mexican-pork-no (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user mexican]
      [full-meal-mexican ?user yes]
      [meat-mexican-round1 ?user pork/beef]
      [is-expensive ?user no]]
  then [pork ?user no])

;;; ethnicity specific

```

```

(defrule spicy-mexican (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user mexican]
       [full-meal-mexican ?user yes]
       [is-spicy ?user yes]]
  then [use-chili ?user yes])

(defrule spicy-mexican-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user mexican]
       [full-meal-mexican ?user yes]
       [is-spicy ?user no]]
  then [use-chili ?user no])

(defrule cheese-mexican (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user mexican]
       [full-meal-mexican ?user yes]
       [lactose-tolerant ?user yes]]
  then [has-cheese ?user yes])

(defrule cheese-mexican-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user mexican]
       [full-meal-mexican ?user yes]
       [lactose-tolerant ?user no]]
  then [has-cheese ?user no])

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;;;
;;;;
;;> Inference Rules (For importance, higher values go first.) ;;;
;;> Domain: Chinese Food Specific ;;;
;;;;
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;;
;;> Meal Type

(defrule full-meal-chinese (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user chinese]
       [or [meal ?user lunch]
           [meal ?user dinner]]]
  then [full-meal-chinese ?user yes])

(defrule dessert-meal-chinese (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user chinese]
       [meal ?user dessert]]
  then [dessert-meal-chinese ?user yes])

(defrule full-meal-chinese-exclusion (:forward :certainty 1.0 :importance 90)
  if [full-meal-chinese ?user yes]
  then [and [dessert-meal-chinese ?user no]
        [having-dessert ?user no]])

(defrule dessert-meal-chinese-exclusion (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user chinese]
       [meal ?user dessert]]
  then [full-meal-chinese ?user no])

;;> Figure out meat

;;> General selection

(defrule meat-type-healthy-chinese (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]

```

```

[full-meal-chinese ?user yes]
[health-conscious ?user yes]]
then [meat-chinese-round1 ?user poultry/seafood])

(defrule meat-type-unhealthy-chinese (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]
       [full-meal-chinese ?user yes]
       [health-conscious ?user no]]
  then [meat-chinese-round1 ?user pork/beef])

    ;;; final selection

(defrule meat-seafood-chinese (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]
       [full-meal-chinese ?user yes]
       [meat-chinese-round1 ?user poultry/seafood]
       [is-near-coast ?user yes]]
  then [seafood ?user yes])

(defrule meat-seafood-chinese-no (:backward :certainty 1.0 :importance 11)
  if [and [food-ethnicity ?user chinese]
       [full-meal-chinese ?user yes]
       [meat-chinese-round1 ?user pork/beef]]
  then [seafood ?user no])

(defrule meat-seafood-chinese-no2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]
       [full-meal-chinese ?user yes]
       [meat-chinese-round1 ?user poultry/seafood]
       [is-near-coast ?user no]]
  then [seafood ?user no])

(defrule meat-poultry-chinese (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]
       [full-meal-chinese ?user yes]
       [meat-chinese-round1 ?user poultry/seafood]
       [is-near-coast ?user no]]
  then [poultry ?user yes])

(defrule meat-poultry-chinese-no (:backward :certainty 1.0 :importance 11)
  if [and [food-ethnicity ?user chinese]
       [full-meal-chinese ?user yes]
       [meat-chinese-round1 ?user pork/beef]]
  then [poultry ?user no])

(defrule meat-poultry-chinese-no2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]
       [full-meal-chinese ?user yes]
       [meat-chinese-round1 ?user poultry/seafood]
       [is-near-coast ?user yes]]
  then [poultry ?user no])

(defrule meat-beef-chinese (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]
       [full-meal-chinese ?user yes]
       [meat-chinese-round1 ?user pork/beef]
       [is-expensive ?user yes]]
  then [beef ?user yes])

(defrule meat-beef-chinese-no (:backward :certainty 1.0 :importance 11)

```

```

if [and [food-ethnicity ?user chinese]
       [full-meal-chinese ?user yes]
       [meat-chinese-round1 ?user poultry/seafood]]
then [beef ?user no])

(defrule meat-beef-chinese-no2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]
        [full-meal-chinese ?user yes]
        [meat-chinese-round1 ?user pork/beef]
        [is-expensive ?user no]]
  then [beef ?user no])

(defrule meat-pork-chinese (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]
        [full-meal-chinese ?user yes]
        [meat-chinese-round1 ?user pork/beef]
        [is-expensive ?user no]]
  then [pork ?user yes])

(defrule meat-pork-chinese-no (:backward :certainty 1.0 :importance 11)
  if [and [food-ethnicity ?user chinese]
        [full-meal-chinese ?user yes]
        [meat-chinese-round1 ?user poultry/seafood]]
  then [pork ?user no])

(defrule meat-pork-chinese-no2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]
        [full-meal-chinese ?user yes]
        [meat-chinese-round1 ?user pork/beef]
        [is-expensive ?user yes]]
  then [pork ?user no])

;;; ethnicity specific

(defrule spicy-chinese1 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]
        [full-meal-chinese ?user yes]
        [is-spicy ?user yes]]
  then [use-ginger ?user yes])

(defrule spicy-chinese1-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]
        [full-meal-chinese ?user yes]
        [is-spicy ?user no]]
  then [use-ginger ?user no])

(defrule spicy-chinese2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]
        [full-meal-chinese ?user yes]
        [is-spicy ?user yes]]
  then [use-chili ?user yes])

(defrule spicy-chinese2-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user chinese]
        [full-meal-chinese ?user yes]
        [is-spicy ?user no]]
  then [use-chili ?user no])

```

;;;;;;;;;;;;;;;

```

;;;
;;; Inference Rules (For importance, higher values go first.) ;;
;;; Domain: Middle Eastern Food Specific ;;
;;;
:::::::::::;

;;; Meal Type

(defrule full-meal-middle-eastern (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user middle-eastern]
       [or [meal ?user lunch]
           [meal ?user dinner]]]
  then [full-meal-middle-eastern ?user yes])

(defrule dessert-meal-middle-eastern (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user middle-eastern]
       [meal ?user dessert]]
  then [dessert-meal-middle-eastern ?user yes])

(defrule full-meal-middle-eastern-exclusion (:forward :certainty 1.0 :importance 90)
  if [full-meal-middle-eastern ?user yes]
  then [and [dessert-meal-middle-eastern ?user no]
        [having-dessert ?user no]])

(defrule dessert-meal-middle-eastern-exclusion (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user middle-eastern]
       [meal ?user dessert]]
  then [full-meal-middle-eastern ?user no])

;;; Figure out meat

;;; General selection

(defrule meat-type-healthy-middle-eastern (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user middle-eastern]
       [full-meal-middle-eastern ?user yes]
       [health-conscious ?user yes]]
  then [meat-middle-eastern-round1 ?user poultry/seafood])

(defrule meat-type-not-healthy-middle-eastern (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user middle-eastern]
       [full-meal-middle-eastern ?user yes]
       [health-conscious ?user no]]
  then [meat-middle-eastern-round1 ?user beef/lamb])

;;; final selection

(defrule meat-type-poultry-middle-eastern (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user middle-eastern]
       [full-meal-middle-eastern ?user yes]
       [meat-middle-eastern-round1 ?user poultry/seafood]
       [is-near-coast ?user no]]
  then [poultry ?user yes])

(defrule meat-type-poultry-middle-eastern-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user middle-eastern]
       [full-meal-middle-eastern ?user yes]
       [meat-middle-eastern-round1 ?user poultry/seafood]
       [is-near-coast ?user yes]]
  then [poultry ?user no])

```

```

(defrule meat-type-poultry-middle-eastern-no2 (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user middle-eastern]
      [full-meal-middle-eastern ?user yes]
      [meat-middle-eastern-round1 ?user beef/lamb]]
  then [poultry ?user no])

(defrule meat-type-seafood-middle-eastern (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user middle-eastern]
      [full-meal-middle-eastern ?user yes]
      [meat-middle-eastern-round1 ?user poultry/seafood]
      [is-near-coast ?user yes]]
  then [seafood ?user yes])

(defrule meat-type-seafood-middle-eastern-no (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user middle-eastern]
      [full-meal-middle-eastern ?user yes]
      [meat-middle-eastern-round1 ?user poultry/seafood]
      [is-near-coast ?user no]]
  then [seafood ?user no])

(defrule meat-type-seafood-middle-eastern-no2 (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user middle-eastern]
      [full-meal-middle-eastern ?user yes]
      [meat-middle-eastern-round1 ?user beef/lamb]]
  then [seafood ?user no])

(defrule meat-type-lamb-middle-eastern (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user middle-eastern]
      [full-meal-middle-eastern ?user yes]
      [meat-middle-eastern-round1 ?user beef/lamb]
      [like-indian ?user yes]]
  then [lamb ?user yes])

(defrule meat-type-lamb-middle-eastern-no (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user middle-eastern]
      [full-meal-middle-eastern ?user yes]
      [meat-middle-eastern-round1 ?user beef/lamb]
      [like-indian ?user no]]
  then [lamb ?user no])

(defrule meat-type-lamb-middle-eastern-no2 (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user middle-eastern]
      [full-meal-middle-eastern ?user yes]
      [meat-middle-eastern-round1 ?user poultry/seafood]]
  then [lamb ?user no])

(defrule meat-type-beef-middle-eastern (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user middle-eastern]
      [full-meal-middle-eastern ?user yes]
      [meat-middle-eastern-round1 ?user beef/lamb]
      [like-indian ?user no]]
  then [beef ?user yes])

(defrule meat-type-beef-middle-eastern-no (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user middle-eastern]
      [full-meal-middle-eastern ?user yes]
      [meat-middle-eastern-round1 ?user beef/lamb]
      [like-indian ?user yes]]
  then [beef ?user no])

```

```

(defrule meat-type-beef-middle-eastern-no2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user middle-eastern]
       [full-meal-middle-eastern ?user yes]
       [meat-middle-eastern-round1 ?user poultry/seafood]]
  then [beef ?user no])

    ;;; ethnicity specific

(defrule tarragon-middle-eastern (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user middle-eastern]
       [full-meal-middle-eastern ?user yes]
       [likes-savory ?user yes]]
  then [use-tarragon ?user yes])

(defrule tarragon-middle-eastern-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user middle-eastern]
       [full-meal-middle-eastern ?user yes]
       [likes-savory ?user no]]
  then [use-tarragon ?user no])

(defrule dill-middle-eastern (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user middle-eastern]
       [full-meal-middle-eastern ?user yes]
       [likes-savory ?user yes]]
  then [use-dill ?user yes])

(defrule dill-middle-eastern-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user middle-eastern]
       [full-meal-middle-eastern ?user yes]
       [likes-savory ?user no]]
  then [use-dill ?user no])

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;;
;;;   Inference Rules (For importance, higher values go first.)   ;;
;;;   Domain: Indian Food Specific                                ;;
;;;
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

    ;;; Meal Type

(defrule full-meal-indian (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user indian]
       [or [meal ?user lunch]
           [meal ?user dinner]]]
  then [full-meal-indian ?user yes])

(defrule dessert-meal-indian (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user indian]
        [meal ?user dessert]]
  then [dessert-meal-indian ?user yes])

(defrule full-meal-indian-exclusion (:forward :certainty 1.0 :importance 90)
  if [full-meal-indian ?user yes]
  then [and [dessert-meal-indian ?user no]
        [having-dessert ?user no]])

(defrule dessert-meal-indian-exclusion (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user indian]

```

```

[meal ?user dessert]]
then [full-meal-indian ?user no])

;;; Figure out meat

(defrule meat-type-poultry-indian(:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user indian]
      [full-meal-indian ?user yes]
      [health-conscious ?user yes]]
  then [poultry ?user yes])

(defrule meat-type-poultry-indian-no(:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user indian]
      [full-meal-indian ?user yes]
      [health-conscious ?user no]]
  then [poultry ?user no])

(defrule meat-type-lamb-indian(:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user indian]
      [full-meal-indian ?user yes]
      [health-conscious ?user no]]
  then [lamb ?user yes])

(defrule meat-type-lamb-indian-no(:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user indian]
      [full-meal-indian ?user yes]
      [health-conscious ?user yes]]
  then [lamb ?user no])

;;; ethnicity specific

(defrule spicy-indian (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user indian]
      [full-meal-indian ?user yes]
      [is-spicy ?user yes]]
  then [use-curry ?user yes])

(defrule spicy-indian-no (:backward :certainty 1.0 :importance 10)
  if [and  [food-ethnicity ?user indian]
      [full-meal-indian ?user yes]
      [is-spicy ?user no]]
  then [use-curry ?user no])

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;
;; Inference Rules (For importance, higher values go first.) ;;
;; Domain: French Food Specific ;;
;;
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

;;; Meal Type

(defrule full-meal-french (:backward :certainty 1.0 :importance 91)
  if [and  [food-ethnicity ?user french]
      [or [meal ?user lunch]
          [meal ?user dinner]]]
  then [full-meal-french ?user yes])

(defrule dessert-meal-french (:backward :certainty 1.0 :importance 91)

```

```

if [and [food-ethnicity ?user french]
       [meal ?user dessert]]
then [dessert-meal-french ?user yes])

(defrule full-meal-french-exclusion (:forward :certainty 1.0 :importance 90)
  if [full-meal-french ?user yes]
  then [and [dessert-meal-french ?user no]
          [having-dessert ?user no]])

(defrule dessert-meal-french-exclusion (:backward :certainty 1.0 :importance 91)
  if [and [food-ethnicity ?user french]
       [meal ?user dessert]]
  then [full-meal-french ?user no])

;; Figure out meat

;; General selection

(defrule meat-type-healthy-french (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french]
       [full-meal-french ?user yes]
       [health-conscious ?user yes]]
  then [meat-french-round1 ?user poultry/seafood])

(defrule meat-type-unhealthy-french (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french ]
       [full-meal-french ?user yes]
       [health-conscious ?user no]]
  then [meat-french-round1 ?user pork/gamebird])

;; final selection

(defrule meat-seafood-french (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french ]
       [full-meal-french ?user yes]
       [meat-french-round1 ?user poultry/seafood]
       [is-near-coast ?user yes]]
  then [seafood ?user yes])

(defrule meat-seafood-french-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french ]
       [full-meal-french ?user yes]
       [meat-french-round1 ?user poultry/seafood]
       [is-near-coast ?user no]]
  then [seafood ?user no])

(defrule meat-seafood-french-no2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french ]
       [full-meal-french ?user yes]
       [meat-french-round1 ?user pork/gamebird]]
  then [seafood ?user no])

(defrule meat-poultry-french (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french ]
       [full-meal-french ?user yes]
       [meat-french-round1 ?user poultry/seafood]
       [is-near-coast ?user no]]
  then [poultry ?user yes])

(defrule meat-poultry-french-no (:backward :certainty 1.0 :importance 10)

```

```

if [and [food-ethnicity ?user french ]
       [full-meal-french ?user yes]
       [meat-french-round1 ?user poultry/seafood]
       [is-near-coast ?user yes]]
then [poultry ?user no)

(defrule meat-poultry-french-no2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french ]
        [full-meal-french ?user yes]
        [meat-french-round1 ?user pork/gamebird]]
  then [poultry ?user no])

(defrule meat-gamebird-french (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french ]
        [full-meal-french ?user yes ]
        [meat-french-round1 ?user pork/gamebird]
        [exotic-taste ?user yes]]
  then [gamebird ?user yes])

(defrule meat-gamebird-french-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french ]
        [full-meal-french ?user yes ]
        [meat-french-round1 ?user pork/gamebird]
        [exotic-taste ?user no]]
  then [gamebird ?user no])

(defrule meat-gamebird-french-no2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french ]
        [full-meal-french ?user yes ]
        [meat-french-round1 ?user poultry/seafood]]
  then [gamebird ?user no])

(defrule meat-pork-french (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french ]
        [full-meal-french ?user yes ]
        [meat-french-round1 ?user pork/gamebird]
        [exotic-taste ?user no]]
  then [pork ?user yes])

(defrule meat-pork-french-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french ]
        [full-meal-french ?user yes ]
        [meat-french-round1 ?user pork/gamebird]
        [exotic-taste ?user yes]]
  then [pork ?user no])

(defrule meat-pork-french-no2 (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french ]
        [full-meal-french ?user yes ]
        [meat-french-round1 ?user poultry/seafood]]
  then [pork ?user no])

;;; ethnicity specific

(defrule garlic-french (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french ]
        [full-meal-french ?user yes ]
        [on-date ?user no]]
  then [use-garlic ?user yes])

```

```

(defrule garlic-french-no (:backward :certainty 1.0 :importance 10)
  if [and [food-ethnicity ?user french]
       [full-meal-french ?user yes]
       [on-date ?user yes]]
  then [use-garlic ?user no])

;;;;;;;;;;;;;;;;
;;;
;;; Inference Rules (For importance, higher values go first.) ;;
;;; Domain: General Rules Based on Ethnicities ;;
;;;
;;;;;;;;;;;;;;;

;;; Dessert fixer

(defrule desserter1 (:backward :certainty 1.0 :importance 5)
  if [meal ?user dessert]
  then [poultry ?user no])

(defrule desserter2 (:backward :certainty 1.0 :importance 5)
  if [meal ?user dessert]
  then [beef ?user no])

(defrule desserter3 (:backward :certainty 1.0 :importance 5)
  if [meal ?user dessert]
  then [lamb ?user no])

(defrule desserter4 (:backward :certainty 1.0 :importance 5)
  if [meal ?user dessert]
  then [seafood ?user no])

(defrule desserter5 (:backward :certainty 1.0 :importance 5)
  if [meal ?user dessert]
  then [shellfish ?user no])

(defrule desserter6 (:backward :certainty 1.0 :importance 5)
  if [meal ?user dessert]
  then [gamebird ?user no])

(defrule desserter7 (:backward :certainty 1.0 :importance 5)
  if [meal ?user dessert]
  then [pork ?user no])

;;;;
(defrule no-meat (:forward :certainty 1.0 :importance 90)
  if [meal ?user dessert]
  then [final-meat ?user none])

(defrule no-meat2 (:forward :certainty 1.0 :importance 90)
  if [final-meat ?user none]
  then [and [beef ?user no]
           [seafood ?user no]
           [poultry ?user no]
           [pork ?user no]
           [lamb ?user no]
           [gamebird ?user no]
           [shellfish ?user no]])

```

```

(defrule BBQ (:forward :certainty 1.0 :importance 90)
  if [final-meat ?user bbq]
  then [and [beef ?user yes]
          [seafood ?user no]
          [poultry ?user yes]
          [pork ?user yes]
          [lamb ?user no]
          [gamebird ?user no]
          [shellfish ?user no]])

(defrule beef (:forward :certainty 1.0 :importance 91)
  if [beef ?user yes]
  then [and [seafood ?user no]
            [poultry ?user no]
            [pork ?user no]
            [lamb ?user no]
            [gamebird ?user no]
            [shellfish ?user no]])

(defrule seafood (:forward :certainty 1.0 :importance 90)
  if [seafood ?user yes]
  then [and [beef ?user no]
            [poultry ?user no]
            [pork ?user no]
            [lamb ?user no]
            [gamebird ?user no]
            [shellfish ?user yes]])

(defrule poultry (:forward :certainty 1.0 :importance 90)
  if [poultry ?user yes]
  then [and [beef ?user no]
            [seafood ?user no]
            [pork ?user no]
            [lamb ?user no]
            [gamebird ?user no]
            [shellfish ?user no]])

(defrule pork (:forward :certainty 1.0 :importance 90)
  if [pork ?user yes]
  then [and [beef ?user no]
            [seafood ?user no]
            [poultry ?user no]
            [lamb ?user no]
            [gamebird ?user no]
            [shellfish ?user no]])

(defrule lamb (:forward :certainty 1.0 :importance 90)
  if [lamb ?user yes]
  then [and [beef ?user no]
            [seafood ?user no]
            [poultry ?user no]
            [pork ?user no]
            [gamebird ?user no]
            [shellfish ?user no]])

(defrule gamebird (:forward :certainty 1.0 :importance 90)
  if [gamebird ?user yes]
  then [and [beef ?user no]
            [seafood ?user no]
            [poultry ?user no]])

```

```

[pork ?user no]
[lamb ?user no]
[shellfish ?user no]])

(defrule shellfish (:forward :certainty 1.0 :importance 90)
  if [shellfish ?user yes]
  then [and [beef ?user no]
            [seafood ?user no]
            [poultry ?user no]
            [pork ?user no]
            [lamb ?user no]
            [gamebird ?user no]])

(defrule no-pasta (:forward :certainty 1.0 :importance 99)
  if [or [food-ethnicity ?user american]
      [food-ethnicity ?user french]
      [food-ethnicity ?user caribbean]
      [food-ethnicity ?user mexican]
      [food-ethnicity ?user indian]
      [food-ethnicity ?user middle-eastern]
      [food-ethnicity ?user chinese]]
  then [is-pasta ?user no])

(defrule no-cheese (:forward :certainty 1.0 :importance 99)
  if [or [lactose-tolerant ?user no]
      [or [food-ethnicity ?user american]
          [food-ethnicity ?user french]
          [food-ethnicity ?user caribbean]
          [food-ethnicity ?user indian]
          [food-ethnicity ?user middle-eastern]
          [food-ethnicity ?user chinese]]]
  then [has-cheese ?user no])

;;; the sauces yes or no rules

(defrule BBQ-sauce-yes (:backward :certainty 1.0 :importance 99)
  if [or [use-bbq-sauce-r1 ?user yes]
      [and [use-bbq-sauce-r1 ?user maybe]
          [and [is-south ?user yes]
              [is-summer ?user yes]]]]
  then [use-bbq-sauce ?user yes])

(defrule BBQ-sauce-no (:backward :certainty 1.0 :importance 99)
  if [or [use-bbq-sauce-r1 ?user no]
      [and [use-bbq-sauce-r1 ?user maybe]
          [or [is-south ?user no]
              [is-summer ?user no]]]]
  then [use-bbq-sauce ?user no])

(defrule tomato-sauce-yes (:backward :certainty 1.0 :importance 99)
  if [or [has-tomatoes-r1 ?user yes]
      [and [has-tomatoes-r1 ?user maybe]
          [or [and [lactose-tolerant ?user no]
                  [is-summer ?user yes]]
              [and [lactose-tolerant ?user yes]
                  [is-summer ?user yes]]]]]
  then [has-tomatoes ?user yes])

(defrule tomato-sauce-no (:backward :certainty 1.0 :importance 99)
  if [or [has-tomatoes-r1 ?user no]

```

```

[and      [has-tomatoes-r1 ?user maybe]
           [or [and      [lactose-tolerant ?user no]
                           [is-summer ?user no]]
               [and      [lactose-tolerant ?user yes]
                           [is-summer ?user no]]]]
then     [has-tomatoes ?user no])

(defrule cream-sauce-yes (:backward :certainty 1.0 :importance 99)
  if  [or [use-cream-sauce-r1 ?user yes]
        [and      [use-cream-sauce-r1 ?user maybe]
                           [lactose-tolerant ?user yes]]]
then   [use-cream-sauce ?user yes])

(defrule cream-sauce-no (:backward :certainty 1.0 :importance 99)
  if  [or [use-cream-sauce-r1 ?user no]
        [and      [use-cream-sauce-r1 ?user maybe]
                           [lactose-tolerant ?user no]]]
then   [use-cream-sauce ?user no])

(defrule curry-sauce-yes (:backward :certainty 1.0 :importance 99)
  if  [or [use-curry-sauce-r1 ?user yes]
        [and      [use-curry-sauce-r1 ?user maybe]
                           [use-curry ?user yes]]]
then   [use-curry-sauce ?user yes])

(defrule curry-sauce-no (:backward :certainty 1.0 :importance 99)
  if  [or [use-curry-sauce-r1 ?user no]
        [and      [use-curry-sauce-r1 ?user maybe]
                           [use-curry ?user no]]]
then   [use-curry-sauce ?user no])

;; the herbs/sauces
;; This is a real cheap way to do this, there has to be a simpler way

(defrule american-herbs-sauces (:forward :certainty 1.0 :importance 99)
  if  [food-ethnicity ?user american]
  then [and      [use-mint ?user no]
            [use-sage ?user yes]
            [use-cinnamon ?user yes]
            [use-black-pepper ?user yes]
            [use-bay-leaf ?user yes]
            [use-parsley ?user yes]
            [use-nutmeg ?user yes]
            [use-chili ?user yes]
            [use-curry ?user no]
            [use-oregano ?user yes]
            [use-basil ?user yes]
            [use-tarragon ?user yes]
            [use-thyme ?user no]
            [use-clove ?user no]
            [use-garlic ?user yes]
            [use-pepper ?user no]
            [use-mustard ?user yes]
            [use-ginger ?user yes]
            [use-dill ?user no]
            [use-caribbean ?user no]
            [use-bbq-sauce-r1 ?user maybe]
            [use-light-sauce ?user no]
            [has-tomatoes-r1 ?user no]
            [use-cream-sauce-r1 ?user no]]

```

```

[use-curry-sauce-r1 ?user no]
[is-pasta ?user no]
[lamb ?user no]
[gamebird ?user no]])

(defrule caribbean-herbs-sauces (:forward :certainty 1.0 :importance 99)
  if [food-ethnicity ?user caribbean]
  then [and [use-mint ?user no]
            [use-sage ?user yes]
            [use-cinnamon ?user yes]
            [use-black-pepper ?user yes]
            [use-bay-leaf ?user yes]
            [use-parsley ?user yes]
            [use-nutmeg ?user yes]
            [use-chili ?user no]
            [use-curry ?user no]
            [use-oregano ?user yes]
            [use-basil ?user yes]
            [use-tarragon ?user yes]
            [use-thyme ?user no]
            [use-clove ?user no]
            [use-garlic ?user yes]
            [use-pepper ?user no]
            [use-mustard ?user yes]
            [use-ginger ?user yes]
            [use-dill ?user no]
            [use-caribbean ?user yes]
            [use-bbq-sauce-r1 ?user no]
            [use-light-sauce ?user yes]
            [has-tomatoes-r1 ?user maybe]
            [use-cream-sauce-r1 ?user maybe]
            [use-curry-sauce-r1 ?user no]
            [is-pasta ?user no]
            [lamb ?user no]
            [gamebird ?user no]
          ])

(defrule italian-herbs-sauces (:forward :certainty 1.0 :importance 99)
  if [food-ethnicity ?user italian]
  then [and [use-mint ?user no]
            [use-sage ?user yes]
            [use-cinnamon ?user yes]
            [use-black-pepper ?user yes]
            [use-bay-leaf ?user yes]
            [use-parsley ?user yes]
            [use-nutmeg ?user yes]
            [use-chili ?user yes]
            [use-curry ?user no]
            [use-oregano ?user yes]
            [use-basil ?user yes]
            [use-tarragon ?user yes]
            [use-thyme ?user no]
            [use-clove ?user no]
            [use-garlic ?user yes]
            [use-pepper ?user no]
            [use-mustard ?user yes]
            [use-ginger ?user yes]
            [use-dill ?user no]
            [use-caribbean ?user yes]
            [use-bbq-sauce-r1 ?user no]
          ])

```

```

[use-light-sauce ?user no]
[has-tomatoes-r1 ?user maybe]
[use-cream-sauce-r1 ?user maybe]
[use-curry-sauce-r1 ?user no]
[is-pasta ?user yes]
[lamb ?user no]
[gamebird ?user no]])

(defrule mexican-herbs-sauces (:forward :certainty 1.0 :importance 99)
  if [food-ethnicity ?user mexican]
  then [and [use-mint ?user no]
             [use-sage ?user yes]
             [use-cinnamon ?user yes]
             [use-black-pepper ?user yes]
             [use-bay-leaf ?user yes]
             [use-parsley ?user yes]
             [use-nutmeg ?user yes]

             [use-curry ?user no]
             [use-oregano ?user yes]
             [use-basil ?user yes]
             [use-tarragon ?user yes]
             [use-thyme ?user no]
             [use-clove ?user no]
             [use-garlic ?user yes]
             [use-pepper ?user no]
             [use-mustard ?user yes]
             [use-ginger ?user yes]
             [use-dill ?user no]
             [use-caribbean ?user yes]
             [use-bbq-sauce-r1 ?user no]
             [use-light-sauce ?user yes]
             [has-tomatoes-r1 ?user maybe]
             [use-cream-sauce-r1 ?user maybe]
             [use-curry-sauce-r1 ?user no]
             [lamb ?user no]
             [gamebird ?user no]
             [seafood ?user no]
             [shellfish ?user no]]])

(defrule chinese-herbs-sauces (:forward :certainty 1.0 :importance 99)
  if [food-ethnicity ?user chinese]
  then [and [use-mint ?user no]
             [use-sage ?user yes]
             [use-cinnamon ?user yes]
             [use-black-pepper ?user yes]
             [use-bay-leaf ?user yes]
             [use-parsley ?user yes]
             [use-nutmeg ?user yes]

             [use-curry ?user no]
             [use-oregano ?user yes]
             [use-basil ?user yes]
             [use-tarragon ?user yes]
             [use-thyme ?user no]
             [use-clove ?user no]
             [use-garlic ?user yes]
             [use-pepper ?user no]
             [use-mustard ?user yes]]

```

```

[use-dill ?user no]
[use-caribbean ?user yes]
[use-bbq-sauce-r1 ?user no]
[use-light-sauce ?user yes]
[has-tomatoes-r1 ?user no]
[use-cream-sauce-r1 ?user maybe]
[use-curry-sauce-r1 ?user no]
[is-pasta ?user no]
[lamb ?user no]
[gamebird ?user no]])

(defrule middle-eastern-herbs-sauces (:forward :certainty 1.0 :importance 99)
  if [food-ethnicity ?user middle-eastern]
  then [and [use-mint ?user no]
            [use-sage ?user yes]
            [use-cinnamon ?user yes]
            [use-black-pepper ?user yes]
            [use-bay-leaf ?user yes]
            [use-parsley ?user yes]
            [use-nutmeg ?user yes]
            [use-chili ?user yes]
            [use-curry ?user no]
            [use-oregano ?user yes]
            [use-basil ?user yes]

            [use-thyme ?user no]
            [use-clove ?user no]
            [use-garlic ?user yes]
            [use-pepper ?user no]
            [use-mustard ?user yes]
            [use-ginger ?user yes]

            [use-caribbean ?user yes]
            [use-bbq-sauce-r1 ?user no]
            [use-light-sauce ?user yes]
            [has-tomatoes-r1 ?user no]
            [use-cream-sauce-r1 ?user maybe]
            [use-curry-sauce-r1 ?user no]
            [is-pasta ?user no]
            [pork ?user no]
            [gamebird ?user no]
            ])
)

(defrule indian-herbs-sauces (:forward :certainty 1.0 :importance 99)
  if [food-ethnicity ?user indian]
  then [and [use-mint ?user no]
            [use-sage ?user yes]
            [use-cinnamon ?user yes]
            [use-black-pepper ?user yes]
            [use-bay-leaf ?user yes]
            [use-parsley ?user yes]
            [use-nutmeg ?user yes]
            [use-chili ?user yes]

            [use-oregano ?user yes]
            [use-basil ?user yes]
            [use-tarragon ?user yes]
            [use-thyme ?user no]
            [use-clove ?user no]
            [use-garlic ?user yes]

```

```

[use-pepper ?user no]
[use-mustard ?user yes]
[use-ginger ?user yes]
[use-dill ?user no]
[use-caribbean ?user yes]
[use-bbq-sauce-r1 ?user no]
[use-light-sauce ?user no]
[has-tomatoes-r1 ?user no]
[use-cream-sauce-r1 ?user maybe]
[use-curry-sauce-r1 ?user maybe]
[is-pasta ?user no]
[beef ?user no]
[pork ?user no]
[gamebird ?user no]
[seafood ?user no]
[shellfish ?user no]
])

(defrule french-herbs-sauces (:forward :certainty 1.0 :importance 99)
  if [food-ethnicity ?user french]
  then [and [use-mint ?user no]
           [use-sage ?user yes]
           [use-cinnamon ?user yes]
           [use-black-pepper ?user yes]
           [use-bay-leaf ?user yes]
           [use-parsley ?user yes]
           [use-nutmeg ?user yes]
           [use-chili ?user yes]
           [use-curry ?user no]
           [use-oregano ?user yes]
           [use-basil ?user yes]
           [use-tarragon ?user yes]
           [use-thyme ?user no]
           [use-clove ?user no]

           [use-pepper ?user no]
           [use-mustard ?user yes]
           [use-ginger ?user yes]
           [use-dill ?user no]
           [use-caribbean ?user yes]
           [use-bbq-sauce-r1 ?user no]
           [use-light-sauce ?user yes]
           [has-tomatoes-r1 ?user maybe]
           [use-cream-sauce-r1 ?user maybe]
           [use-curry-sauce-r1 ?user no]
           [is-pasta ?user no]
           [lamb ?user no]
           [beef ?user no]])

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;;
;;; Inference Rules (For importance, higher values go first.) ;;
;;; Domain: Drink Type Preference ;;
;;;
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
(defrule sweet-drinks (:backward :certainty 1.0 :importance 60)
  if [prefers-fruit-punch ?user yes]
  then [prefers-sweet-wines ?user yes])

```

```

(defrule sweet-drinks2 (:backward :certainty 1.0 :importance 60)
  if [prefers-fruit-punch ?user no]
  then [prefers-sweet-wines ?user no])

(defrule dry-drinks (:backward :certainty 1.0 :importance 59)
  if [prefers-iced-tea ?user yes]
  then [prefers-dry-wines ?user yes])

(defrule dry-drinks2 (:backward :certainty 1.0 :importance 59)
  if [prefers-iced-tea ?user no]
  then [prefers-dry-wines ?user no])

(defrule wine-exclusion1 (:forward :certainty 1.0 :importance 69)
  if [prefers-sweet-wines ?user yes]
  then [prefers-dry-wines ?user no])

(defrule wine-exclusion2 (:forward :certainty 1.0 :importance 69)
  if [prefers-dry-wines ?user yes]
  then [prefers-sweet-wines ?user no])

;; The following rules are used as a second layer of knowledge. It
;; helps to determine some facts that the user does not know
;; To implement it as a "backup" or "secondary" layer, i need to
;; change the values for these domain from simple booleans to a list of values
;; and then have the check for a "I don't know" response in the antecedent

```

```

;;;;;;;;;;;;;;
;;;
;;;  Inference Rules (For importance, higher values go first.) ;;
;;;  Domain: Location ;;
;;;
;;;;;;;;;;;;;;

```

```

(defrule near-coastl (:backward :certainty 1.0 :importance 10)
  if [or    [is-near-coast-r1 ?user yes]
      [and   [is-near-coast-r1 ?user idk]
              [or    [goes-to-the-beach ?user yes]
                  [has-boat ?user yes]]]]
  then [is-near-coast ?user yes])

(defrule near-coast-no (:backward :certainty 1.0 :importance 10)
  if [or    [is-near-coast-r1 ?user no]
      [and   [is-near-coast-r1 ?user idk]
              [or    [goes-to-the-beach ?user no]
                  [has-boat ?user no]]]]
  then [is-near-coast ?user no])

(defrule warm-state (:backward :certainty 1.0 :importance 58)
  if [and  [minimum-temp ?user ?x]
        (> ?x 0)]
  then [is-south ?user yes])

(defrule warm-state-no (:backward :certainty 1.0 :importance 58)
  if [and  [minimum-temp ?user ?x]
        (< ?x 0)]
  then [is-south ?user no])

```

```

(defrule cold-n-country (:backward :certainty 1.0 :importance 58)
  if [or      [and [minimum-temp ?user ?x]
                  (< ?x 0)
                  [likes-country ?user yes]]
      [says-pop ?user yes]]
  then [is-midwest ?user yes])

(defrule midwest-no (:backward :certainty 1.0 :importance 58)
  if      [and      [minimum-temp ?user ?x]
            (< ?x 0)
            [likes-country ?user no]
            [says-pop ?user no]]
  then [is-midwest ?user no])

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;
;; Inference Rules (For importance, higher values go first.) ;;
;; Domain: Health Conscious ;;
;;
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

(defrule health-conscious-yes (:backward :certainty 1.0 :importance 90)
  if [or      [health-conscious-r1 ?user yes]
      [and      [health-conscious-r1 ?user idk]
                  [or      [has-dieted-in-past-year ?user yes]
                          [exercises ?user yes]
                          [follows-the-pyramid ?user yes]
                          [is-vegetarian ?user yes]]]
  then [health-conscious ?user yes])

(defrule health-conscious-no (:backward :certainty 1.0 :importance 90)
  if [or      [health-conscious-r1 ?user no]
      [and      [health-conscious-r1 ?user idk]
                  [has-dieted-in-past-year ?user no]
                  [exercises ?user no]
                  [follows-the-pyramid ?user no]
                  [is-vegetarian ?user no]]]
  then [health-conscious ?user no])

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;
;; Inference Rules (For importance, higher values go first.) ;;
;; Domain: Savory Food ;;
;;
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

(defrule likes-savory (:backward :certainty 1.0 :importance 58)
  if [or      [like-savory-r1 ?user yes]
      [and      [like-savory-r1 ?user idk]
                  [or      [has-herb-garden ?user yes]
                          [has-several-spices ?user yes]
                          [enjoy-steak-sauce ?user yes]]]
  then [likes-savory ?user yes])

(defrule likes-savory-no (:backward :certainty 1.0 :importance 58)
  if [or      [like-savory-r1 ?user no]
      [and      [like-savory-r1 ?user idk]
                  [has-herb-garden ?user no]]]

```

```

[has-several-spices ?user no]
[enjoy-steak-sauce ?user no]]]
then [likes-savory ?user no])

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;;
;;; Inference Rules (For importance, higher values go first.) ;;
;;; Domain: Restaurant Expense ;;
;;;
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

(defrule expensive-restaurant (:backward :certainty 1.0 :importance 58)
  if [or    [is-expensive-r1 ?user yes]
      [and   [is-expensive-r1 ?user idk]
              [or    [has-valet ?user yes]
                  [has-dress-code ?user yes]
                  [has-host ?user yes]]]]
  then [is-expensive ?user yes])

(defrule cheap-restaurant-1 (:backward :certainty 1.0 :importance 58)
  if [or    [is-expensive-r1 ?user no]
      [or [and   [is-expensive-r1 ?user idk]
                  [has-valet ?user no]
                  [has-dress-code ?user no]
                  [has-host ?user no]]
          [and   [is-expensive-r1 ?user idk]
                  [has-value-menu ?user yes]]]]
  then [is-expensive ?user no])

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;;
;;; Inference Rules (For importance, higher values go first.) ;;
;;; Domain: Exotic taste ;;
;;;
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

(defrule exotic-taste (:backward :certainty 1.0 :importance 82)
  if [or    [exotic-taste-r1 ?user yes]
      [exotic-taste-r1 ?user idk]
      [or    [tries-new-dishes ?user yes]
              [tries-dishes-w-weird-names ?user yes]
              [likes-to-travel ?user yes]
              [hunts ?user yes]]]
  then [exotic-taste ?user yes])

(defrule no-exotic-taste (:backward :certainty 1.0 :importance 82)
  if [or  [exotic-taste-r1 ?user no]
      [and   [exotic-taste-r1 ?user idk]
              [tries-new-dishes ?user no]
              [tries-dishes-w-weird-names ?user no]
              [likes-to-travel ?user no]
              [hunts ?user no]]]
  then [exotic-taste ?user no])

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;;
;;; Inference Rules (For importance, higher values go first.) ;;
;;; Domain: Season Questions ;;
;;;
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

```

```

;; Spring is March 20 through June 19
;; Summer is June 20 through September 21
;; Fall is September 22 through December 20
;; Winter is December 21 through March 19

(defrule spring-time (:backward :certainty 1.0 :importance 82)
  if [or  [month ?user march]
      [month ?user april]
      [month ?user may]]
  then  [is-spring ?user yes])

(defrule spring-time-2 (:forward :certainty 1.0 :importance 82)
  if      [is-spring ?user yes]
  then [and   [is-summer ?user no]
        [is-fall ?user no]
        [is-winter ?user no]])

(defrule summer-time (:backward :certainty 1.0 :importance 82)
  if [or  [month ?user june]
      [month ?user july]
      [month ?user august]]
  then  [is-summer ?user yes])

(defrule summer-time-2 (:forward :certainty 1.0 :importance 82)
  if      [is-summer ?user yes]
  then [and   [is-spring ?user no]
        [is-fall ?user no]
        [is-winter ?user no]])

(defrule fall-time (:backward :certainty 1.0 :importance 82)
  if [or  [month ?user september]
      [month ?user october]
      [month ?user november]]
  then  [is-fall ?user yes])

(defrule fall-time-2 (:forward :certainty 1.0 :importance 82)
  if      [is-fall ?user yes]
  then [and   [is-summer ?user no]
        [is-spring ?user no]
        [is-winter ?user no]])

(defrule winter-time (:backward :certainty 1.0 :importance 82)
  if [or  [month ?user december]
      [month ?user january]
      [month ?user february]]
  then  [is-winter ?user yes])

(defrule winter-time-2 (:forward :certainty 1.0 :importance 82)
  if      [is-winter ?user yes]
  then [and   [is-summer ?user no]
        [is-fall ?user no]
        [is-spring ?user no]])

```

```
;;;;;;
;;;
;;;  Inference Rules (For importance, higher values go first.)  ;;
;;;  Domain:  Lactose/allergy Questions  ;;
;;;
;;;;;
```

```

(defrule lactose-tolerant (:backward :certainty 1.0 :importance 82)
  if [or [lactose-tolerant-r1 ?user yes]
      [and [lactose-tolerant-r1 ?user idk]
            [or [eat-cheese ?user yes]
                [drink-milk ?user yes]
                [eat-ice-cream ?user yes]]]]
  then [lactose-tolerant ?user yes])

(defrule lactose-intolerant (:backward :certainty 1.0 :importance 81)
  if [or [lactose-tolerant-r1 ?user no]
      [and [lactose-tolerant-r1 ?user idk]
            [eat-cheese ?user no]
            [drink-milk ?user no]
            [eat-ice-cream ?user no]]]
  then [lactose-tolerant ?user no])

```

```

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;;
;;; Inference Rules (For importance, higher values go first.) ;;;
;;;
;;; Domain: Wine Choices ;;;
;;;
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;;
;;;
;;; Pinot Noir ;;;
;;;
;;;
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

```

```

(defrule pinot-noir-1 (:backward :certainty 1.0 :importance 98)
  if [and [or [poultry ?user yes]
              [pork ?user yes]
              [lamb ?user yes]]
          [or [use-mint ?user yes]
              [use-sage ?user yes]
              [use-cinnamon ?user yes]]
          [has-cheese ?user yes]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user pinot-noir])

```

```

(defrule pinot-noir-2 (:backward :certainty 0.4 :importance 87)
  if [and [or [poultry ?user yes]
              [pork ?user yes]
              [lamb ?user yes]]
          [has-cheese ?user yes]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user pinot-noir])

```

```

(defrule pinot-noir-3 (:backward :certainty 0.6 :importance 86)
  if [and [or [poultry ?user yes]
              [pork ?user yes]
              [lamb ?user yes]]
          [or [use-mint ?user yes]
              [use-sage ?user yes]
              [use-cinnamon ?user yes]]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user pinot-noir])

```

```

(defrule pinot-noir-4 (:backward :certainty 0.8 :importance 85)
  if [and [or [poultry ?user yes]
              [pork ?user yes]
              [lamb ?user yes]]
         [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user pinot-noir])

(defrule pinot-noir-5 (:backward :certainty 0.4 :importance 84)
  if [and [or [use-mint ?user yes]
              [use-sage ?user yes]
              [use-cinnamon ?user yes]]
         [has-cheese ?user yes]
         [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user pinot-noir])

(defrule pinot-noir-6 (:backward :certainty 0.2 :importance 83)
  if [and [has-cheese ?user yes]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user pinot-noir])

;;;;;;;;;;;;
;;;
;;; Cabernet Sauvignon
;;;
;;;;;

(defrule cabernet-sauvignon-1 (:backward :certainty 1.0 :importance 97)
  if [and [or [beef ?user yes]
              [lamb ?user yes]]
         [or [has-cheese ?user yes]
             [is-pasta ?user yes]]
         [has-tomatoes ?user yes]
         [or [use-bay-leaf ?user yes]
             [use-parsley ?user yes]
             [use-nutmeg ?user yes]
             [use-chili ?user yes]
             [use-curry ?user yes]]
         [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-2 (:backward :certainty 0.7 :importance 83)
  if [and [is-pasta ?user yes]
          [has-tomatoes ?user yes]
          [or [use-bay-leaf ?user yes]
              [use-parsley ?user yes]
              [use-nutmeg ?user yes]
              [use-chili ?user yes]
              [use-curry ?user yes]]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-3 (:backward :certainty 0.7 :importance 83)
  if [and [has-cheese ?user yes]
          [has-tomatoes ?user yes]
          [or [use-bay-leaf ?user yes]
              [use-parsley ?user yes]
              [use-nutmeg ?user yes]
              [use-chili ?user yes]]]

```

```

[use-curry ?user yes]]
[prefers-sweet-wines ?user yes]]
then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-4 (:backward :certainty 0.8 :importance 83)
  if [and [or [beef ?user yes]
              [lamb ?user yes]]
          [or [has-cheese ?user yes]
              [is-pasta ?user yes]]
          [or [use-bay-leaf ?user yes]
              [use-parsley ?user yes]
              [use-nutmeg ?user yes]
              [use-chili ?user yes]
              [use-curry ?user yes]]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-5 (:backward :certainty 0.6 :importance 83)
  if [and [is-pasta ?user yes]
          [or [use-bay-leaf ?user yes]
              [use-parsley ?user yes]
              [use-nutmeg ?user yes]
              [use-chili ?user yes]
              [use-curry ?user yes]]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-6 (:backward :certainty 0.6 :importance 83)
  if [and [has-cheese ?user yes]
          [or [use-bay-leaf ?user yes]
              [use-parsley ?user yes]
              [use-nutmeg ?user yes]
              [use-chili ?user yes]
              [use-curry ?user yes]]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-7 (:backward :certainty 0.7 :importance 83)
  if [and [or [beef ?user yes]
              [lamb ?user yes]]
          [or [has-cheese ?user yes]
              [is-pasta ?user yes]]
          [has-tomatoes ?user yes]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-8 (:backward :certainty 0.4 :importance 83)
  if [and [is-pasta ?user yes]
          [has-tomatoes ?user yes]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-9 (:backward :certainty 0.4 :importance 83)
  if [and [has-cheese ?user yes]
          [has-tomatoes ?user yes]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-10 (:backward :certainty 0.6 :importance 83)
  if [and [or [beef ?user yes]

```

```

[lambda ?user yes]]
[or [has-cheese ?user yes]
    [is-pasta ?user yes]]
[prefers-sweet-wines ?user yes]]
then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-11 (:backward :certainty 0.5 :importance 83)
  if [and [or [beef ?user yes]
              [lamb ?user yes]]
          [is-pasta ?user yes]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-12 (:backward :certainty 0.5 :importance 83)
  if [and [or [beef ?user yes]
              [lamb ?user yes]]
          [has-cheese ?user yes]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-13 (:backward :certainty 0.4 :importance 83)
  if [and [or [beef ?user yes]
              [lamb ?user yes]]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-14 (:backward :certainty 0.8 :importance 83)
  if [and [or [beef ?user yes]
              [lamb ?user yes]]
          [or [has-cheese ?user yes]
              [is-pasta ?user yes]]
          [has-tomatoes ?user yes]
          [or [use-bay-leaf ?user yes]
              [use-parsley ?user yes]
              [use-nutmeg ?user yes]
              [use-chili ?user yes]
              [use-curry ?user yes]]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-15 (:backward :certainty 0.5 :importance 83)
  if [and [is-pasta ?user yes]
          [has-tomatoes ?user yes]
          [or [use-bay-leaf ?user yes]
              [use-parsley ?user yes]
              [use-nutmeg ?user yes]
              [use-chili ?user yes]
              [use-curry ?user yes]]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-16 (:backward :certainty 0.5 :importance 83)
  if [and [has-cheese ?user yes]
          [has-tomatoes ?user yes]
          [or [use-bay-leaf ?user yes]
              [use-parsley ?user yes]
              [use-nutmeg ?user yes]
              [use-chili ?user yes]
              [use-curry ?user yes]]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-17 (:backward :certainty 0.6 :importance 83)

```

```

if [and [or [beef ?user yes]
           [lamb ?user yes]]
      [or [has-cheese ?user yes]
           [is-pasta ?user yes]]
      [or [use-bay-leaf ?user yes]
           [use-parsley ?user yes]
           [use-nutmeg ?user yes]
           [use-chili ?user yes]
           [use-curry ?user yes]]]
then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-18 (:backward :certainty 0.4 :importance 83)
  if [and [is-pasta ?user yes]
        [or [use-bay-leaf ?user yes]
            [use-parsley ?user yes]
            [use-nutmeg ?user yes]
            [use-chili ?user yes]
            [use-curry ?user yes]]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-19 (:backward :certainty 0.4 :importance 83)
  if [and [has-cheese ?user yes]
        [or [use-bay-leaf ?user yes]
            [use-parsley ?user yes]
            [use-nutmeg ?user yes]
            [use-chili ?user yes]
            [use-curry ?user yes]]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-20 (:backward :certainty 0.5 :importance 83)
  if [and [or [beef ?user yes]
             [lamb ?user yes]]
        [or [has-cheese ?user yes]
            [is-pasta ?user yes]]
        [has-tomatoes ?user yes]]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-21 (:backward :certainty 0.2 :importance 83)
  if [and [is-pasta ?user yes]
        [has-tomatoes ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-22 (:backward :certainty 0.2 :importance 83)
  if [and [has-cheese ?user yes]
        [has-tomatoes ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-23 (:backward :certainty 0.4 :importance 83)
  if [and [or [beef ?user yes]
             [lamb ?user yes]]
        [or [has-cheese ?user yes]
            [is-pasta ?user yes]]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-24 (:backward :certainty 0.3 :importance 83)
  if [and [or [beef ?user yes]
             [lamb ?user yes]]
        [is-pasta ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

```

```

(defrule cabernet-sauvignon-25 (:backward :certainty 0.3 :importance 83)
  if [and [or [beef ?user yes]
             [lamb ?user yes]]
        [has-cheese ?user yes]]
  then [wine-to-drink ?user cabernet-sauvignon])

(defrule cabernet-sauvignon-26 (:backward :certainty 0.2 :importance 83)
  if [and [or [beef ?user yes]
             [lamb ?user yes]]]
  then [wine-to-drink ?user cabernet-sauvignon])

;;;;;;;;;;;;;;
;;;
;;; Merlot
;;;
;;;;;;;;;;;;;

(defrule merlot-1 (:backward :certainty 1.0 :importance 96)
  if [and [or [beef ?user yes]
              [gamebird ?user yess]
              [lamb ?user yes]
              [seafood ?user yes]]
         [or [has-cheese ?user yes]
              [is-pasta ?user yes]]
         [or [has-tomatoes ?user yes]
              [use-bbq-sauce ?user yes]]
         [or [use-oregano ?user yes]
              [use-basil ?user yes]
              [use-nutmeg ?user yes]
              [use-chili ?user yes]
              [use-curry ?user yes]
              [use-garlic ?user yes]]
         [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user merlot])

(defrule merlot-2 (:backward :certainty 0.8 :importance 83)
  if [and [or [beef ?user yes]
              [gamebird ?user yess]
              [lamb ?user yes]
              [seafood ?user yes]]
         [or [has-tomatoes ?user yes]
              [use-bbq-sauce ?user yes]]
         [or [use-oregano ?user yes]
              [use-basil ?user yes]
              [use-nutmeg ?user yes]
              [use-chili ?user yes]
              [use-curry ?user yes]
              [use-garlic ?user yes]]
         [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user merlot])

(defrule merlot-3 (:backward :certainty 0.8 :importance 83)
  if [and [or [beef ?user yes]
              [gamebird ?user yess]
              [lamb ?user yes]
              [seafood ?user yes]]
         [or [has-cheese ?user yes]
              [is-pasta ?user yes]]
         [or [use-oregano ?user yes]
              [use-basil ?user yes]]]

```

```

[use-nutmeg ?user yes]
[use-chili ?user yes]
[use-curry ?user yes]
[use-garlic ?user yes]]
[prefers-sweet-wines ?user yes]]
then [wine-to-drink ?user merlot])

(defrule merlot-4 (:backward :certainty 0.6 :importance 83)
  if [and [or [beef ?user yes]
              [gamebird ?user yess]
              [lamb ?user yes]
              [seafood ?user yes]]
          [or [has-cheese ?user yes]
              [is-pasta ?user yes]]]
      [or [has-tomatoes ?user yes]
          [use-bbq-sauce ?user yes]]
      [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user merlot])

(defrule merlot-5 (:backward :certainty 0.4 :importance 83)
  if [and [or [beef ?user yes]
              [gamebird ?user yess]
              [lamb ?user yes]
              [seafood ?user yes]]
          [or [has-tomatoes ?user yes]
              [use-bbq-sauce ?user yes]]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user merlot])

(defrule merlot-6 (:backward :certainty 0.4 :importance 83)
  if [and [or [beef ?user yes]
              [gamebird ?user yess]
              [lamb ?user yes]
              [seafood ?user yes]]
          [or [has-cheese ?user yes]
              [is-pasta ?user yes]]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user merlot])

(defrule merlot-7 (:backward :certainty 0.3 :importance 83)
  if [and [or [beef ?user yes]
              [gamebird ?user yess]
              [lamb ?user yes]
              [seafood ?user yes]]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user merlot])

(defrule merlot-8 (:backward :certainty 0.8 :importance 83)
  if [and [or [beef ?user yes]
              [gamebird ?user yess]
              [lamb ?user yes]
              [seafood ?user yes]]
          [or [has-cheese ?user yes]
              [is-pasta ?user yes]]
          [or [has-tomatoes ?user yes]
              [use-bbq-sauce ?user yes]]
          [or [use-oregano ?user yes]
              [use-basil ?user yes]
              [use-nutmeg ?user yes]
              [use-chili ?user yes]]]
  then [wine-to-drink ?user merlot])

```

```

[use-curry ?user yes]
[use-garlic ?user yes]]]
then [wine-to-drink ?user merlot])

(defrule merlot-9 (:backward :certainty 0.6 :importance 83)
  if [and [or [beef ?user yes]
              [gamebird ?user yess]
              [lamb ?user yes]
              [seafood ?user yes]]
          [or [has-tomatoes ?user yes]
              [use-bbq-sauce ?user yes]]]
          [or [use-oregano ?user yes]
              [use-basil ?user yes]
              [use-nutmeg ?user yes]
              [use-chili ?user yes]
              [use-curry ?user yes]
              [use-garlic ?user yes]]]
  then [wine-to-drink ?user merlot])

(defrule merlot-10 (:backward :certainty 0.6 :importance 83)
  if [and [or [beef ?user yes]
              [gamebird ?user yess]
              [lamb ?user yes]
              [seafood ?user yes]]
          [or [has-cheese ?user yes]
              [is-pasta ?user yes]]]
          [or [use-oregano ?user yes]
              [use-basil ?user yes]
              [use-nutmeg ?user yes]
              [use-chili ?user yes]
              [use-curry ?user yes]
              [use-garlic ?user yes]]]
  then [wine-to-drink ?user merlot])

(defrule merlot-11 (:backward :certainty 0.4 :importance 83)
  if [and [or [beef ?user yes]
              [gamebird ?user yess]
              [lamb ?user yes]
              [seafood ?user yes]]
          [or [has-cheese ?user yes]
              [is-pasta ?user yes]]]
          [or [has-tomatoes ?user yes]
              [use-bbq-sauce ?user yes]]]
  then [wine-to-drink ?user merlot])

(defrule merlot-12 (:backward :certainty 0.2 :importance 83)
  if [and [or [beef ?user yes]
              [gamebird ?user yess]
              [lamb ?user yes]
              [seafood ?user yes]]
          [or [has-tomatoes ?user yes]
              [use-bbq-sauce ?user yes]]]
  then [wine-to-drink ?user merlot])

(defrule merlot-13 (:backward :certainty 0.2 :importance 83)
  if [and [or [beef ?user yes]
              [gamebird ?user yess]
              [lamb ?user yes]
              [seafood ?user yes]]
          [or [has-cheese ?user yes]
              [use-oregano ?user yes]]]
  then [wine-to-drink ?user merlot])

```

```

[is-pasta ?user yes]]]
then [wine-to-drink ?user merlot])

(defrule merlot-14 (:backward :certainty 0.1 :importance 83)
  if  [or [beef ?user yes]
        [gamebird ?user yess]
        [lamb ?user yes]
        [seafood ?user yes]]
  then [wine-to-drink ?user merlot])

;;;;;;;;;;;;;;
;;;;
;;; Zinfandel
;;;;
;;;;
;;;;;;;;;;;;;;
;

(defrule zinfandel-1 (:backward :certainty 1.0 :importance 95)
  if  [and   [or [pork ?user yes]
                 [gamebird ?user yess]]
       [or [has-cheese ?user yes]
           [is-pasta ?user yes]]
       [or [has-tomatoes ?user yes]
           [use-bbq-sauce ?user yes]]
       [or [use-tarragon ?user yes]
           [use-thyme ?user yes]
           [use-clove ?user yes]
           [use-garlic ?user yes]
           [use-pepper ?user yes]]
       [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user zinfandel])

(defrule zinfandel-2 (:backward :certainty 0.7 :importance 83)
  if  [and   [or [pork ?user yes]
                 [gamebird ?user yess]]
       [or [has-tomatoes ?user yes]
           [use-bbq-sauce ?user yes]]
       [or [use-tarragon ?user yes]
           [use-thyme ?user yes]
           [use-clove ?user yes]
           [use-garlic ?user yes]
           [use-pepper ?user yes]]
       [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user zinfandel])

(defrule zinfandel-3 (:backward :certainty 0.7 :importance 83)
  if  [and   [or [pork ?user yes]
                 [gamebird ?user yess]]
       [or [has-cheese ?user yes]
           [is-pasta ?user yes]]
       [or [use-tarragon ?user yes]
           [use-thyme ?user yes]
           [use-clove ?user yes]
           [use-garlic ?user yes]
           [use-pepper ?user yes]]
       [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user zinfandel])

(defrule zinfandel-4 (:backward :certainty 0.5 :importance 83)
  if  [and   [or [pork ?user yes]

```

```

        [gamebird ?user yess]]
[or [has-cheese ?user yes]
    [is-pasta ?user yes]]
[or [has-tomatoes ?user yes]
    [use-bbq-sauce ?user yes]]
    [prefers-sweet-wines ?user yes]]
then [wine-to-drink ?user zinfandel])

(defrule zinfandel-5 (:backward :certainty 0.6 :importance 83)
  if [and [or [pork ?user yes]
              [gamebird ?user yess]]
         [or [use-tarragon ?user yes]
             [use-thyme ?user yes]
             [use-clove ?user yes]
             [use-garlic ?user yes]
             [use-pepper ?user yes]]
             [prefers-sweet-wines ?user yes]]]
  then [wine-to-drink ?user zinfandel])

(defrule zinfandel-6 (:backward :certainty 0.4 :importance 83)
  if [and [or [pork ?user yes]
              [gamebird ?user yess]]
         [or [has-tomatoes ?user yes]
             [use-bbq-sauce ?user yes]]
             [prefers-sweet-wines ?user yes]]]
  then [wine-to-drink ?user zinfandel])

(defrule zinfandel-7 (:backward :certainty 0.4 :importance 83)
  if [and [or [pork ?user yes]
              [gamebird ?user yess]]
         [or [has-cheese ?user yes]
             [is-pasta ?user yes]]
             [prefers-sweet-wines ?user yes]]]
  then [wine-to-drink ?user zinfandel])

(defrule zinfandel-8 (:backward :certainty 0.8 :importance 83)
  if [and [or [pork ?user yes]
              [gamebird ?user yess]]
         [or [has-cheese ?user yes]
             [is-pasta ?user yes]]
             [or [has-tomatoes ?user yes]
                 [use-bbq-sauce ?user yes]]
                 [or [use-tarragon ?user yes]
                     [use-thyme ?user yes]
                     [use-clove ?user yes]
                     [use-garlic ?user yes]
                     [use-pepper ?user yes]]]
                     [prefers-sweet-wines ?user yes]]]
  then [wine-to-drink ?user zinfandel])

(defrule zinfandel-9 (:backward :certainty 0.5 :importance 83)
  if [and [or [pork ?user yes]
              [gamebird ?user yess]]
         [or [has-tomatoes ?user yes]
             [use-bbq-sauce ?user yes]]
             [or [use-tarragon ?user yes]
                 [use-thyme ?user yes]
                 [use-clove ?user yes]
                 [use-garlic ?user yes]
                 [use-pepper ?user yes]]]
                 [prefers-sweet-wines ?user yes]]]
  then [wine-to-drink ?user zinfandel])

```

```

(defrule zinfandel-10 (:backward :certainty 0.5 :importance 83)
  if [and [or [pork ?user yes]
              [gamebird ?user yess]]
       [or [has-cheese ?user yes]
           [is-pasta ?user yes]]]
       [or [use-tarragon ?user yes]
           [use-thyme ?user yes]
           [use-clove ?user yes]
           [use-garlic ?user yes]
           [use-pepper ?user yes]]]
  then [wine-to-drink ?user zinfandel])

(defrule zinfandel-11 (:backward :certainty 0.3 :importance 83)
  if [and [or [pork ?user yes]
              [gamebird ?user yess]]
       [or [has-cheese ?user yes]
           [is-pasta ?user yes]]]
       [or [has-tomatoes ?user yes]
           [use-bbq-sauce ?user yes]]]
  then [wine-to-drink ?user zinfandel])

(defrule zinfandel-12 (:backward :certainty 0.4 :importance 83)
  if [and [or [pork ?user yes]
              [gamebird ?user yess]]
       [or [use-tarragon ?user yes]
           [use-thyme ?user yes]
           [use-clove ?user yes]
           [use-garlic ?user yes]
           [use-pepper ?user yes]]]
  then [wine-to-drink ?user zinfandel])

(defrule zinfandel-13 (:backward :certainty 0.2 :importance 83)
  if [and [or [pork ?user yes]
              [gamebird ?user yess]]
       [or [has-tomatoes ?user yes]
           [use-bbq-sauce ?user yes]]]
  then [wine-to-drink ?user zinfandel])

(defrule zinfandel-14 (:backward :certainty 0.2 :importance 83)
  if [and [or [pork ?user yes]
              [gamebird ?user yess]]
       [or [has-cheese ?user yes]
           [is-pasta ?user yes]]]
  then [wine-to-drink ?user zinfandel])

;;;;;;;;;;;;;;;;;;;;
;;;
;;; Sauvignon Blanc
;;;
;;;;;;;;;;;;;;;;;;;;
(defrule sauvignon-blanc-1 (:backward :certainty 1.0 :importance 94)
  if [and [or [poultry ?user yes]
              [seafood ?user yes]]
       [is-pasta ?user yes]
       [or [use-garlic ?user yes]
           [use-oregano ?user yes]
           [use-black-pepper ?user yes]]
       [prefers-dry-wines ?user yes]]]

```

```

then [wine-to-drink ?user sauvignon-blanc])

(defrule sauvignon-blanc-2 (:backward :certainty 0.8 :importance 83)
  if [and [or [poultry ?user yes]
              [seafood ?user yes]]
        [or [use-garlic ?user yes]
            [use-oregano ?user yes]
            [use-black-pepper ?user yes]]
        [prefers-dry-wines ?user yes]]
  then [wine-to-drink ?user sauvignon-blanc])

(defrule sauvignon-blanc-3 (:backward :certainty 0.5 :importance 83)
  if [and [or [poultry ?user yes]
              [seafood ?user yes]]
        [prefers-dry-wines ?user yes]]
  then [wine-to-drink ?user sauvignon-blanc])

(defrule sauvignon-blanc-4 (:backward :certainty 0.8 :importance 83)
  if [and [or [poultry ?user yes]
              [seafood ?user yes]]
        [is-pasta ?user yes]
        [or [use-garlic ?user yes]
            [use-oregano ?user yes]
            [use-black-pepper ?user yes]]]
  then [wine-to-drink ?user sauvignon-blanc])

(defrule sauvignon-blanc-5 (:backward :certainty 0.6 :importance 83)
  if [and [or [poultry ?user yes]
              [seafood ?user yes]]
        [or [use-garlic ?user yes]
            [use-oregano ?user yes]
            [use-black-pepper ?user yes]]]
  then [wine-to-drink ?user sauvignon-blanc])

(defrule sauvignon-blanc-6 (:backward :certainty 0.3 :importance 83)
  if [or [poultry ?user yes]
      [seafood ?user yes]]
  then [wine-to-drink ?user sauvignon-blanc])

```

```

::::::::::::::::::;;
;;;;
;;; Chardonnay
;;;;
::::::::::::::::::;

```

```

(defrule chardonnay-1 (:backward :certainty 1.0 :importance 93)
  if [and [or [poultry ?user yes]
              [pork ?user yes]
              [seafood ?user yes]]
        [has-tomatoes ?user no]
        [has-cheese ?user yes]
        [or [use-light-sauce ?user yes]
            [use-cream-sauce ?user yes]]
        [or [use-mustard ?user yes]
            [use-sage ?user yes]
            [use-clove ?user yes]
            [use-ginger ?user yes]]]
  then [wine-to-drink ?user chardonnay])

```

```

[use-caribbean ?user yes]]
[prefers-dry-wines ?user yes]]
then [wine-to-drink ?user chardonnay])

(defrule chardonnay-2 (:backward :certainty 0.8 :importance 83)
  if [and [or [poultry ?user yes]
              [pork ?user yes]
              [seafood ?user yes]]
          [has-tomatoes ?user no]
          [or [use-light-sauce ?user yes]
              [use-cream-sauce ?user yes]]]
          [or [use-mustard ?user yes]
              [use-sage ?user yes]
              [use-clove ?user yes]
              [use-ginger ?user yes]
              [use-caribbean ?user yes]]
          [prefers-dry-wines ?user yes]]
  then [wine-to-drink ?user chardonnay])

(defrule chardonnay-3 (:backward :certainty 0.7 :importance 83)
  if [and [or [poultry ?user yes]
              [pork ?user yes]
              [seafood ?user yes]]
          [has-tomatoes ?user no]
          [has-cheese ?user yes]
          [or [use-mustard ?user yes]
              [use-sage ?user yes]
              [use-clove ?user yes]
              [use-ginger ?user yes]
              [use-caribbean ?user yes]]
          [prefers-dry-wines ?user yes]]
  then [wine-to-drink ?user chardonnay])

(defrule chardonnay-4 (:backward :certainty 0.6 :importance 83)
  if [and [or [poultry ?user yes]
              [pork ?user yes]
              [seafood ?user yes]]
          [has-tomatoes ?user no]
          [has-cheese ?user yes]
          [or [use-light-sauce ?user yes]
              [use-cream-sauce ?user yes]]]
          [prefers-dry-wines ?user yes]]
  then [wine-to-drink ?user chardonnay])

(defrule chardonnay-5 (:backward :certainty 0.6 :importance 83)
  if [and [or [poultry ?user yes]
              [pork ?user yes]
              [seafood ?user yes]]
          [has-tomatoes ?user no]
          [or [use-mustard ?user yes]
              [use-sage ?user yes]
              [use-clove ?user yes]
              [use-ginger ?user yes]
              [use-caribbean ?user yes]]
          [prefers-dry-wines ?user yes]]
  then [wine-to-drink ?user chardonnay])

(defrule chardonnay-6 (:backward :certainty 0.5 :importance 83)
  if [and [or [poultry ?user yes]
              [pork ?user yes]

```

```

[seafood ?user yes]]
[has-tomatoes ?user no]
[or [use-light-sauce ?user yes]
   [use-cream-sauce ?user yes]]
[prefers-dry-wines ?user yes]]
then [wine-to-drink ?user chardonnay])

(defrule chardonnay-7 (:backward :certainty 0.4 :importance 83)
  if [and [or [poultry ?user yes]
               [pork ?user yes]
               [seafood ?user yes]]
          [has-tomatoes ?user no]
          [has-cheese ?user yes]
          [prefers-dry-wines ?user yes]]
  then [wine-to-drink ?user chardonnay])

(defrule chardonnay-8 (:backward :certainty 0.8 :importance 83)
  if [and [or [poultry ?user yes]
               [pork ?user yes]
               [seafood ?user yes]]
          [has-tomatoes ?user no]
          [has-cheese ?user yes]
          [or [use-light-sauce ?user yes]
              [use-cream-sauce ?user yes]]
          [or [use-mustard ?user yes]
              [use-sage ?user yes]
              [use-clove ?user yes]
              [use-ginger ?user yes]
              [use-caribbean ?user yes]]]
  then [wine-to-drink ?user chardonnay])

(defrule chardonnay-9 (:backward :certainty 0.6 :importance 83)
  if [and [or [poultry ?user yes]
               [pork ?user yes]
               [seafood ?user yes]]
          [has-tomatoes ?user no]
          [or [use-light-sauce ?user yes]
              [use-cream-sauce ?user yes]]
          [or [use-mustard ?user yes]
              [use-sage ?user yes]
              [use-clove ?user yes]
              [use-ginger ?user yes]
              [use-caribbean ?user yes]]]
  then [wine-to-drink ?user chardonnay])

(defrule chardonnay-10 (:backward :certainty 0.5 :importance 83)
  if [and [or [poultry ?user yes]
               [pork ?user yes]
               [seafood ?user yes]]
          [has-tomatoes ?user no]
          [has-cheese ?user yes]
          [or [use-mustard ?user yes]
              [use-sage ?user yes]
              [use-clove ?user yes]
              [use-ginger ?user yes]
              [use-caribbean ?user yes]]]
  then [wine-to-drink ?user chardonnay])

(defrule chardonnay-11 (:backward :certainty 0.4 :importance 83)
  if [and [or [poultry ?user yes]

```

```

[pork ?user yes]
[seafood ?user yes]]
[has-tomatoes ?user no]
[has-cheese ?user yes]
[or [use-light-sauce ?user yes]
    [use-cream-sauce ?user yes]]]
then [wine-to-drink ?user chardonnay])

(defrule chardonnay-12 (:backward :certainty 0.4 :importance 83)
  if [and [or [poultry ?user yes]
              [pork ?user yes]
              [seafood ?user yes]]
           [has-tomatoes ?user no]
           [or [use-mustard ?user yes]
               [use-sage ?user yes]
               [use-clove ?user yes]
               [use-ginger ?user yes]
               [use-caribbean ?user yes]]]
  then [wine-to-drink ?user chardonnay])

(defrule chardonnay-13 (:backward :certainty 0.3 :importance 83)
  if [and [or [poultry ?user yes]
              [pork ?user yes]
              [seafood ?user yes]]
           [has-tomatoes ?user no]
           [or [use-light-sauce ?user yes]
               [use-cream-sauce ?user yes]]]
  then [wine-to-drink ?user chardonnay])

(defrule chardonnay-14 (:backward :certainty 0.2 :importance 83)
  if [and [or [poultry ?user yes]
              [pork ?user yes]
              [seafood ?user yes]]
           [has-tomatoes ?user no]
           [has-cheese ?user yes]]
  then [wine-to-drink ?user chardonnay])

```

```

;;;;;;;;;;;;
;;;;
;;;;
;;; Riesling
;;;;
;;;;
;;;;;
```

```

(defrule riesling-desert (:backward :certainty 0.9 :importance 90)
  if [meal ?user dessert]
  then [wine-to-drink ?user riesling])
```

```

(defrule riesling-desert-2 (:backward :certainty 1.0 :importance 91)
  if [and [meal ?user dessert]
         [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user riesling])
```

```

(defrule riesling-1 (:backward :certainty 1.0 :importance 92)
  if [and [or [poultry ?user yes]
              [shellfish ?user yes]]
           [has-cheese ?user yes]
           [use-light-sauce ?user yes]
           [or [use-dill ?user yes]
```

```

[use-sage ?user yes]
[use-clove ?user yes]
[use-ginger ?user yes]]
[prefers-sweet-wines ?user yes]]
then [wine-to-drink ?user riesling])

(defrule riesling-2 (:backward :certainty 0.8 :importance 83)
  if [and [or [poultry ?user yes]
              [shellfish ?user yes]]
          [use-light-sauce ?user yes]
          [or [use-dill ?user yes]
              [use-sage ?user yes]
              [use-clove ?user yes]
              [use-ginger ?user yes]]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user riesling])

(defrule riesling-3 (:backward :certainty 0.8 :importance 83)
  if [and [or [poultry ?user yes]
              [shellfish ?user yes]]
          [has-cheese ?user yes]
          [or [use-dill ?user yes]
              [use-sage ?user yes]
              [use-clove ?user yes]
              [use-ginger ?user yes]]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user riesling])

(defrule riesling-4 (:backward :certainty 0.5 :importance 83)
  if [and [or [poultry ?user yes]
              [shellfish ?user yes]]
          [has-cheese ?user yes]
          [use-light-sauce ?user yes]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user riesling])

(defrule riesling-5 (:backward :certainty 0.5 :importance 83)
  if [and [or [poultry ?user yes]
              [shellfish ?user yes]]
          [or [use-dill ?user yes]
              [use-sage ?user yes]
              [use-clove ?user yes]
              [use-ginger ?user yes]]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user riesling])

(defrule riesling-6 (:backward :certainty 0.3 :importance 83)
  if [and [or [poultry ?user yes]
              [shellfish ?user yes]]
          [use-light-sauce ?user yes]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user riesling])

(defrule riesling-7 (:backward :certainty 0.3 :importance 83)
  if [and [or [poultry ?user yes]
              [shellfish ?user yes]]
          [has-cheese ?user yes]
          [prefers-sweet-wines ?user yes]]
  then [wine-to-drink ?user riesling])

```

;;;;;;;;;;;;;; End of File ;;;;;;;;;;;;;;;