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1. Vector d representing daily diet

The vector can be given as follows :

```
d = [3;2;30;0.5;6;5]

% Each component in the vector d represents amount of each food taken daily
% in the diet like 3 pints of milk,  2 cups of coffee, 30 cookies,
% 0.5 bowl of muesli, 6 ounces of broccoli, and 5 slices of pizza.


    d =

        3.000000000000000
        2.000000000000000
       30.000000000000000
        0.500000000000000
        6.000000000000000
        5.000000000000000
```

2. Vector p representing nutritional properties of 1 slice of pizza

The vector p can be given as follows :

```
p = [34;45;7;721;4.5]

% Each component in the vector p represents amount of a specific nutrient.
% 34 is Vitamin X, 45 is Vitamin Y, 7 is fiber, 721 are calories, and 4.5
% are fats


    p =

       1.0e+02 *

       0.340000000000000
       0.450000000000000
       0.070000000000000
       7.210000000000000
```

0.045000000000000

3. Amount of fiber in daily diet

The vectors y and z can be guven as follows :

```
y = [7;0;12;210;122;7];

z = [3;2;30;0.5;6;5];

% The components in y represents the amount of fiber per unit of that food.
% The components in z represent the quantity of each food consumed per day.
% So, basically product of transpose(y) and z will give us total amount of
% fibers consumed per day by food. We will store result in f.

f = transpose(y) * z
```

f =

1253

4. Amount of fat

Similar to 3); we can obtain amount of fat content in our daily diet by multiplying amount of fat per unit of that food with quantity of that food consumed each day. Let x represent the amount of fat per unit of that food. We will reuse the vector z from the previous problem which denotes amount of food consumed each day.

```
x = [2.4;0;8.3;1.40;0.9;4.5];

% Result will be stored in f;

f = transpose(x) * z

% So, we can conclude that amount of fat is less than 290 in daily diet.
```

f =

2.848000000000000e+02

5. Amount of i'th nutrient

We can obtain amount of each nutrient in daily diet by constucting a matrix A which has amount of nutrients in a food in a row with each column denoting different food. We will construct vector x such that it has amount of food consumed per day. The multiplication of A and x will give value of i'th nutrient in daily diet which will be stored in r;.

```
A = [55 0 2 15 25 34;
```

```
      12 0 14 32 40 45;
      7 0 12 210 122 7;
      103 0 300 60 54 721;
      2.4 0 8.3 1.4 0.9 4.5];

x = [3;2;30;0.5;6;5];

r = A * x


      r =

        1.0e+04 *

        0.055250000000000
        0.093700000000000
        0.125300000000000
        1.326800000000000
        0.028480000000000
```

6. 10 cups of coffee every day rather than 2

As 10 cups of coffee are consumed instead of 10, there will be change in vector x used in 5. problem. The 2(which denoted amount of coffee) will be replaced by 10. Thus, new x is as follows:

```
x = [3;2;30;0.5;6;5];

r = A * x

% Thus, taking 10 cups of coffee instead of 2 will have no change in
% nutrients as coffee corresponded to zero element in A matrix.


      r =

        1.0e+04 *

        0.055250000000000
        0.093700000000000
        0.125300000000000
        1.326800000000000
        0.028480000000000
```

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