

A Chinese Zodiac Program

The following program determines the animal and associated characteristics from the Chinese Zodiac for a given year of birth. This program utilizes the following programming features:

► tuples

► datetime module

Example execution of the program is given below:

```
This program will display your Chinese zodiac sign and associated
personal characteristics.

Enter your year of birth (yyyy): 1984
Your Chinese zodiac sign is the Rat

Your personal characteristics ...
Forthright, industrious, sensitive, intellectual, sociable

Would you like to enter another year? (y/n): y
Enter your year of birth (yyyy): 1986
Your Chinese zodiac sign is the Tiger

Your personal characteristics ...
Unpredictable, rebellious, passionate, daring, impulsive

Would you like to enter another year? (y/n): n
>>>
```

Task: In IDLE, open a new project and save it as ChineseZodiac_yourLastName. Copy the code from the sample on the next page. Test and revise the program, as needed.

```

1  # Chinese Zodiac Program
2
3  import datetime
4
5  # init
6  zodiac_animals = ('Rat', 'Ox', 'Tiger', 'Rabbit', 'Dragon', 'Snake', 'Horse',
7                   'Goat', 'Monkey', 'Rooster', 'Dog', 'Pig')
8
9  rat = 'Forthright, industrious, sensitive, intellectual, sociable'
10 ox = 'Dependable, methodical, modest, born leader, patient'
11 tiger = 'Unpredictable, rebellious, passionate, daring, impulsive'
12 rabbit = 'Good friend, kind, soft-spoken, cautious, artistic'
13 dragon = 'Strong, self-assured, proud, decisive, loyal'
14 snake = 'Deep thinker, creative, responsible, calm, purposeful'
15 horse = 'Cheerful, quick-witted, perceptive, talkative, open-minded'
16 goat = 'Sincere, sympathetic, shy, generous, mothering'
17 monkey = 'Motivator, inquisitive, flexible, innovative, problem solver'
18 rooster = 'Organized, self-assured, decisive, perfectionist, zealous'
19 dog = 'Honest, unpretentious, idealistic, moralistic, easy going'
20 pig = 'Peace-loving, hard-working, trusting, understanding, thoughtful'
21
22 characteristics = (rat, ox, tiger, rabbit, dragon, snake, horse, goat, monkey,
23                   rooster, dog, pig)
24 terminate = False
25
26 # program greeting
27 print('This program will display your Chinese zodiac sign and associated')
28 print('personal characteristics.\n')
29
30 # get current year from module datetime
31 current_yr = datetime.date.today().year
32
33 while not terminate:
34     # get year of birth
35     birth_year = int(input('Enter your year of birth (yyyy): '))
36
37     while birth_year < 1900 or birth_year > current_yr:
38         print('Invalid year. Please re-enter\n')
39         birth_year = int(input('Enter your year of birth (yyyy): '))
40
41     # output results
42     cycle_num = (birth_year - 1900) % 12
43
44     print('Your Chinese zodiac sign is the', zodiac_animals[cycle_num], '\n')
45     print('Your personal characteristics ...')
46     print(characteristics[cycle_num])
47
48     # continue?
49     response = input('\nWould you like to enter another year? (y/n): ')
50
51     while response != 'y' and response != 'n':
52         response = input("Please enter 'y' or 'n': ")
53
54     if response == 'n':
55         terminate = True
56

```

Notes:

Line 3 imports the `datetime` module. It provides the current year (line 31), used to check for invalid years of birth (only years between 1900 and the current year are considered valid). Lines 9–24 perform the initialization for the program. The variables on lines 9–20 are assigned the characteristics of each animal. The set of characteristics is represented as a tuple (line 22), and not a list type, since the information is not meant to be altered. It associates each set of characteristics with the corresponding year of the twelve-year cycle of the zodiac based on their position in the tuple. (We could have defined `characteristics` to contain

each of the twelve string descriptions, without the use of variables `rat`, `ox`, and so on. It was written this way for the sake of readability.) Variable `terminate`, initialized to `False`, is a Boolean flag used to quit the program once set to `True` (in response to the user being asked to continue with another month or not at line 50). Lines 27–28 display the program greeting.

Lines 33–56 comprise the main loop of the program. The while loop at line 38 ensures that the entered year is valid. On line 43, the `cycle_num` for the individual is assigned a value between 0–11, based on their year of birth. Since the year 1900 was the year of the rat in the Chinese Zodiac, the value of `cycle_num` is $(\text{birth_year} - 1900) \% 12$. Lines 45–47 then use the `cycle_num` as an index into tuple `zodiac_animals` (to get the animal for that birth year) and tuple `characteristics` (to get the associated personal characteristics) to display the results.

Extension

1. Chinese Zodiac Program: Japanese and Vietnamese Variations: Modify the Chinese Zodiac program in the chapter to allow the user to select the Chinese Zodiac, the Japanese Zodiac, or the Vietnamese Zodiac. The Japanese Zodiac is the same as the Chinese Zodiac, except that “Pig” is substituted with “Wild Boar.” The Vietnamese Zodiac is also the same except that the “Ox” is substituted with “Water Buffalo” and “Rabbit” is replaced with “Cat.”