#!/usr/bin/env python

# coding: utf-8

# In[1]:

# constants

valid\_home\_cat = ["house", "apartment", "mobilehome"]

valid\_home\_own = ["owned", "mortgaged", "rented", "hotel", "occupied"]

BREAK\_WORD = "END"

# In[2]:

def is\_posint(number):

    """

    Parameter: number

    Return: True if number is a positive integer, False if it is not positive or if it is not convertible to integer

    """

    try:

        # convert input to int

        number = int(number)

    except:

        # if cannot convert to int, return False

        return False

    if number > 0:

        # if number is not positive, return False

        return True

    else:

        # if number is positive, return True

        return False

# In[3]:

def get\_home\_category():

    """

    Parameter: None

    Return:

        "END" if user wants enters "END"

        home category in lowercase if valid, else keeps on asking for input until valid input is provided or "END" is entered

    """

    print(

        'HINT: \n \

                "house" (has space between any neighbouring homes)\n \

                "apartment" (is connected to neighbouring homes)\n \

                "mobileHome" (includes caravan, tent, or cardboard box).\n\n'

    )

    while True:

        # ask user for home category

        home\_category = input(f"Please write your home category: {valid\_home\_cat}: ")

        # if user enters "END", return "END"

        if home\_category == BREAK\_WORD:

            return home\_category

        # if user enters valid home category, return home category in lowercase

        if home\_category.lower() in valid\_home\_cat:

            return home\_category.lower()

        # if user enters invalid home category, print warning and keep on asking for input until valid input is provided or "END" is entered

        else:

            print("WARNING: Invalid home category. Please try again.\n")

            continue

# In[4]:

def get\_home\_ownership():

    """

    Parameter: None

    Return: home ownership in lowercase

    """

    # print hint

    print(

        'HINT: \n \

                "Owned" (Owned by you or someone in this household free and clear)\n \

                "Mortgaged" (Owned by you or someone in this household with a mortgage or loan)\n \

                "Rented" (Regular payments are made to the owner or his/her agent)\n \

                "Hotel" (An apartment rented for 10 days or less)\n \

                "Occupied" (Nobody at this location owns the property or pays rent)\n'

    )

    while True:

        # ask user for home ownership

        home\_ownership = input(f"Please write your home ownership: {valid\_home\_own}: ")

        # if user enters valid home ownership, return home ownership in lowercase

        if home\_ownership.lower() in valid\_home\_own:

            return home\_ownership.lower()

        # if user enters invalid home ownership, print warning and keep on asking for input until valid input is provided

        else:

            print("WARNING: Invalid home ownership. Please try again.\n\n")

            continue

# In[5]:

def get\_num\_persons():

    """

    Parameter: None

    Return: number of persons in int

    """

    # print hint

    print(

        "HINT: \n \

            How many people (living human beings) are living or staying in this home (house, apartment, or mobile home)."

    )

    while True:

        # ask user for number of persons

        num\_persons = input("Please write number of persons: ")

        # if user enters valid number of persons, return number of persons

        if is\_posint(num\_persons):

            return int(num\_persons)

        # if user enters invalid number of persons, print warning and keep on asking for input until valid input is provided

        else:

            print("WARNING:Invalid number of persons. Please try again.\n")

            continue

# In[6]:

def get\_num\_females(num\_persons):

    """

    Parameter: None

    Return: number of females in int

    """

    # print hint

    remaining\_persons = int(num\_persons)

    print(

        f"HINT: \n \

            The number of female persons living in this household.\n \

            Remaining persons are {remaining\_persons}.\n\n"

    )

    while True:

        # ask user for number of females

        num\_females = input("Please write number of females: ")

        # if user enters valid number of females

        if is\_posint(num\_females):

            # if number of females is greater than remaining persons, print warning and keep on asking for input until valid input is provided

            if int(num\_females) > remaining\_persons:

                print(

                    "WARNING: Invalid number of females. It is greater than number of persons. Please try again.\n"

                )

                continue

            # if number of females is less than or equal to remaining persons, return number of females

            else:

                return int(num\_females)

        # if user enters invalid number of females, print warning and keep on asking for input until valid input is provided

        else:

            print("WARNING: Invalid number of females. Please try again.\n")

            continue

# In[7]:

def get\_num\_males(num\_persons, num\_females):

    """

    Parameter: None

    Return: number of males in int

    """

    # print hint

    remaining\_persons = int(num\_persons) - int(num\_females)

    print(

        f"HINT: The number of male persons living in this household.\n \

            Remaining persons are {remaining\_persons}.\n\n"

    )

    while True:

        # ask user for number of males

        num\_males = input("Please write number of males: ")

        # if user enters valid number of males

        if is\_posint(num\_males):

            # if number of males is greater than remaining persons, print warning and keep on asking for input until valid input is provided

            if int(num\_males) > remaining\_persons:

                print(

                    f"WARNING: Invalid number of males. It is greater than number of persons minus number of females, i.e. {remaining\_persons} Please try again.\n"

                )

                continue

            # if number of males is less than or equal to remaining persons, return number of males

            else:

                return int(num\_males)

        # if user enters invalid number of males, print warning and keep on asking for input until valid input is provided

        else:

            print("WARNING: Invalid number of males. Please try again.\n")

            continue

# In[8]:

def get\_num\_children(num\_persons, num\_females, num\_males):

    """

    Parameter: None

    Return: number of children in int

    """

    # print hint

    remaining\_persons = int(num\_persons) - int(num\_females) - int(num\_males)

    print(

        f"HINT: The number of young individuals (<18 years old) living in this household.\n \

            Remaining persons are {remaining\_persons}.\n\n"

    )

    while True:

        # ask user for number of children

        num\_children = input("Please write number of children: ")

        if is\_posint(num\_children):

            # if number of children is greater than remaining persons, print warning and keep on asking for input until valid input is provided

            if int(num\_children) > remaining\_persons:

                print(

                    f"Invalid number of children. It is greater than number of persons minus number of females and males, i.e. {remaining\_persons} Please try again."

                )

                continue

            # if number of children is less than or equal to remaining persons, return number of children

            else:

                return int(num\_children)

        # if user enters invalid number of children, print warning and keep on asking for input until valid input is provided

        else:

            print("Invalid number of children. Please try again.")

            continue

# In[9]:

def get\_total\_income():

    """

    Parameter: None

    Return: total income in int

    """

    # print hint

    print(

        "HINT: The sum of all people's annual salary in this home that provides funds for the household's running."

    )

    while True:

        # ask user for total income

        total\_income = input("Please write total income: ")

        # if user enters valid total income return total income in int

        if is\_posint(total\_income):

            return int(total\_income)

        # if user enters invalid total income, print warning and keep on asking for input until valid input is provided

        else:

            print("WARNING: Invalid total income. Please try again.")

            continue

# In[10]:

def display(

    home\_ownership,

    home\_category,

    num\_persons,

    num\_females,

    num\_males,

    num\_children,

    total\_income,

):

    """

    Parameter: home\_ownership, home\_category, num\_persons, num\_females, num\_males, num\_children, total\_income

    Return: None

    Displays home ownership, home category, number of persons, number of females, number of males, number of children, and total income

    """

    print("\n\n")

    # print headings

    print(

        "{:<20}{:<20}{:<20}{:<20}{:<20}".format(

            "Home Ownership",

            "Home Category",

            "Num\_Persons",

            "Num\_Females",

            "Num\_Males",

            "Num\_Children",

            "Total\_Income",

        )

    )

    # print lines

    print(

        "{:<20}{:<20}{:<20}{:<20}{:<20}".format(

            "\_\_\_\_\_\_\_\_\_\_\_\_\_\_",

            "\_\_\_\_\_\_\_\_\_\_\_\_\_",

            "\_\_\_\_\_\_\_\_\_\_\_",

            "\_\_\_\_\_\_\_\_\_\_\_",

            "\_\_\_\_\_\_\_\_\_",

            "\_\_\_\_\_\_\_\_\_\_\_\_",

            "\_\_\_\_\_\_\_\_\_\_\_\_",

        )

    )

    # print the parameters

    print(

        "{:<20}{:<20}{:<20}{:<20}{:<20}".format(

            home\_ownership,

            home\_category,

            num\_persons,

            num\_females,

            num\_males,

            num\_children,

            total\_income,

        )

    )

    print("\n\n")

# In[11]:

def main():

    while True:

        # print hint

        print("HINT: Type 'END' if you want to exit.")

        # get home category

        home\_category = get\_home\_category()

        # if user enters "END", exit

        if home\_category == "END":

            print("Thank you for using this program.")

            break

        # get home ownership

        home\_ownership = get\_home\_ownership()

        # get number of persons

        num\_persons = get\_num\_persons()

        # get number of females

        num\_females = get\_num\_females(num\_persons)

        # get number of males

        num\_males = get\_num\_males(num\_persons, num\_females)

        # get number of children

        num\_children = get\_num\_children(num\_persons, num\_females, num\_males)

        # get total income

        total\_income = get\_total\_income()

        # display home ownership, home category, number of persons, number of females, number of males, number of children, and total income

        display(

            home\_ownership,

            home\_category,

            num\_persons,

            num\_females,

            num\_males,

            num\_children,

            total\_income,

        )

# In[12]:

main()

# In[ ]: