//

// main.c

// Chpt10PP2

//

// Created by Randy McMillan on 11/21/13.

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//

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\* 2. Define a structure type element\_t to represent one element from the peri- odic table of elements. Components should include the atomic number (an integer); the name, chemical symbol, and class (strings); a numeric field for the atomic weight; and a seven-element array of integers for the number of electrons in each shell. The following are the components of an element\_t structure for sodium.

\* 11 Sodium Na alkali\_metal 22.9898 2 8 1 0 0 0 0

\* Define and test I/O functions scan\_element and print\_element.

\*

\*

\*/

#include <stdio.h>

#define ZERO 0

#define LINE\_LENGTH 80

char resetString;

struct {

char elementName[80];

int atomicNum;

char chemicalSymbol[80];

char class[80];

double atomicWeight;

int shell[7];

} element\_t;

void myMain();

void scan\_element();

char \*scanString(char \*dest, int dest\_len);

int \*scanInt(int \*dest, int dest\_len);

double \*scanDouble(double \*dest, int dest\_len);

void enterElementName();

void enterAtomicNumber();

void enterChemicalSymbol();

void enterClass();

void enterAtomicWeight();

void enterShellOne();

void enterShellTwo();

void enterShellThree();

void enterShellFour();

void enterShellFive();

void enterShellSix();

void enterShellSeven();

void print\_element();

int main(int argc, const char \*argv[])

{

myMain();

return 0;

}

void myMain()

{

scan\_element();

}

void scan\_element()

{

enterElementName();

enterChemicalSymbol();

enterClass();

//

//

enterAtomicNumber();

enterAtomicWeight();

//

//

enterShellOne();

enterShellTwo();

enterShellThree();

enterShellFour();

enterShellFive();

enterShellSix();

enterShellSeven();

//

//

print\_element();

}

void enterElementName()

{

printf("Please enter the Element Name ---> ");

scanString(element\_t.elementName, LINE\_LENGTH);

}

void enterChemicalSymbol()

{

printf("Please enter the Chemical Symbol for %s ---> ", element\_t.elementName);

scanString(element\_t.chemicalSymbol, LINE\_LENGTH);

}

void enterClass()

{

printf("Please enter the Element Class ---> ");

scanString(element\_t.class, LINE\_LENGTH);

}

void enterAtomicNumber()

{

printf("Please enter the Atomic Number ---> ");

// scanInt(&element\_t.atomicNum, LINE\_LENGTH);

scanInt(&element\_t.atomicNum, LINE\_LENGTH);

}

void enterAtomicWeight()

{

printf("Please enter the Atomic Weight ---> ");

scanDouble(&element\_t.atomicWeight, LINE\_LENGTH);

}

void enterShellOne()

{

printf("Please enter the Shell One ---> ");

scanInt(&element\_t.shell[0], LINE\_LENGTH);

}

void enterShellTwo()

{

printf("Please enter the Shell Two ---> ");

scanInt(&element\_t.shell[1], LINE\_LENGTH);

}

void enterShellThree()

{

printf("Please enter the Shell Three ---> ");

scanInt(&element\_t.shell[2], LINE\_LENGTH);

}

void enterShellFour()

{

printf("Please enter the Shell Four ---> ");

scanInt(&element\_t.shell[3], LINE\_LENGTH);

}

void enterShellFive()

{

printf("Please enter the Shell Five ---> ");

scanInt(&element\_t.shell[4], LINE\_LENGTH);

}

void enterShellSix()

{

printf("Please enter the Shell Six ---> ");

scanInt(&element\_t.shell[5], LINE\_LENGTH);

}

void enterShellSeven()

{

printf("Please enter the Shell Seven ---> ");

scanInt(&element\_t.shell[6], LINE\_LENGTH);

}

void print\_element()

{

// 11 Sodium Na alkali\_metal 22.9898 2 8 1 0 0 0 0

printf("\n%i %s %s %.80s %.4lf %i %i %i %i %i %i %i\n", element\_t.atomicNum, element\_t.elementName, element\_t.chemicalSymbol, element\_t.class, element\_t.atomicWeight, element\_t.shell[0], element\_t.shell[1], element\_t.shell[2], element\_t.shell[3], element\_t.shell[4], element\_t.shell[5], element\_t.shell[6]);

}

// Based on Figure 8.15 in Book

char \*scanString(char \*dest, int dest\_len)

{

int i, ch;

i = ZERO;

for (ch = getchar(); ch != '\n' && ch != EOF && i < dest\_len - 1; ch = getchar()) {

dest[i++] = ch;

}

dest[i] = '\0';

while (ch != '\n' && ch != EOF) {

ch = getchar();

}

return dest;

}

int \*scanInt(int \*dest, int dest\_len)

{

scanf("\n%i", dest);

return dest;

}

double \*scanDouble(double \*dest, int dest\_len)

{

scanf("\n%lf", dest);

return dest;

}

