#The list of atoms

atoms=["Hydrogen","Helium","Lithium","Beryllium","Boron","Carbon","Nitrogen","Oxygen","Fluorine","Neon","Sodium","Magnesium","Aluminium","Silicon","Phosphorus","Sulfur","Chlorine","Argon","Potassium","Calcium","Scandium","Titanium","Vanadium","Chromium","Manganese","Iron","Cobalt","Nickel","Copper","Zinc","Gallium","Germanium","Arsenic","Selenium","Bromine","Krypton","Rubidium","Strontium","Yttrium","Zirconium","Niobium","Molybdenum","Technetium","Ruthenium","Rhodium","Palladium","Silver","Cadmium","Indium","Tin","Antimony","Tellurium","Iodine","Xenon","Caesium","Barium","Lanthanum","Cerium","Praseodymium","Neodymium","Promethium","Samarium","Europium","Gadolinium","Terbium","Dysprosium","Holmium","Erbium","Thulium","Ytterbium","Lutetium","Hafnium","Tantalum","Tungsten","Rhenium","Osmium","Iridium","Platinum","Gold","Mercury","Thallium","Lead","Bismuth","Polonium","Astatine","Radon","Francium","Radium"]

#Main program

choice=""

def welcome():

 print("="\*40)

 print(" "\*12,"W E L C O M E")

 print("="\*40)

def add\_atom():

 name=input("Enter the name of an atom to add: ")

 atoms.append(name)

 print(name,"has been added to the list")

def remove\_atom():

 name=input("Enter the name of an atom to remove: ")

 atoms.remove(name)

 print(name,"has been removed from the list")

def linsearch():

 name=input("Enter a search term: ")

 stop=len(atoms)

 for i in range(stop):

 if atoms[i]==name:

 print(name,"is in the list")

 return

 else:

 print(name,"is not in the list")

def edit\_atom():

 print(atoms)

 i=int(input("What is the atomic number of the atom you want to change?\n"))

 print("You are changing",atoms[i-1])

 #'atoms[i-1]' the '-1' is written so that a person who doesn't use python can just search for the atom

 #using its atomic number without knowing they have to type the number one less than the actual number

 atoms[i-1]=input("Enter a new atom: ")

 print(atoms)

def binsearch(atoms):

 atoms.sort()

 name=input("Enter a search term: ")

 while len(atoms)>1:

 midpoint=len(atoms)//2

 if name<atoms[midpoint]:

 atoms=atoms[:midpoint]

 else:

 atoms=atoms[midpoint:]

 if atoms[0]==name:

 print(name,"found in the list")

 else:

 print(name,"not found in the list")

welcome()

while choice!="X":

 print("====================")

 print("A T O M F I N D E R")

 print("====================")

 print("\n")

 print("A: Append an atom to the list")

 print("B: Remove an atom from the list")

 print("C: Print the list")

 print("D: Sort the list")

 print("E: The length of the list")

 print("F: Edit an atom")

 print("G: Print a specific atom")

 print("H: Search if an atom is in the list (linear search)")

 print("I: Search if an atom is in the list (binary search)")

 print("X: Exit the program")

 print("\n")

 choice=input("Choose an option: ")

 if choice=="A":

 add\_atom()

 if choice=="B":

 remove\_atom()

 if choice=="C":

 print(atoms)

 if choice=="D":

 atoms.sort()

 print(atoms)

 if choice=="E":

 print(len(atoms))

 if choice=="F":

 edit\_atom()

 if choice=="G":

 i=int(input("Enter the atomic number of the atom you want to print\n"))

 print(atoms[i-1])

 #'atoms[i-1]' the '-1' is written so that a person who doesn't use python can just search for the

 #atom using its atomic number without knowing they have to type the number one less than the actual number

 if choice=="H":

 linsearch()

 if choice=="I":

 binsearch(atoms)