**1**. import math  
def solve\_quadratic\_equation(a, b, c):  
 if a == 0:  
 print("Error: 'a' coefficient cannot be zero.")  
 return  
 d = b\*\*2 - 4\*a\*c  
  
 if d < 0:  
 print("Error: Roots are complex numbers.")  
 return  
 root1 = (-b + math.sqrt(d)) / (2\*a)  
 root2 = (-b - math.sqrt(d)) / (2\*a)  
  
 print("Root 1:", root1)  
 print("Root 2:", root2)

**2.** a = input("Enter a string")

c = a.split(" ")

y=[]

for i in c:

if y.count(i)==0:

y.append(i)

print(i.title(),"-", a.count(i))

**3.** def count\_letters\_digits(sentence):  
 letters = 0  
 digits = 0  
  
 for char in sentence:  
 if char.isalpha():  
 letters += 1  
 elif char.isdigit():  
 digits += 1  
  
 return letters, digits  
  
input\_sentence = input("Enter a sentence: ")  
letter\_count, digit\_count = count\_letters\_digits(input\_sentence)  
  
print("LETTERS", letter\_count)  
print("DIGITS", digit\_count)

**4.** import re  
 def validate\_password(password):  
 if len(password) < 6 or len(password) > 12:  
 return False  
  
 if not re.search(r"[a-z]", password):  
 return False  
  
 if not re.search(r"\d", password):  
 return False  
  
 if not re.search(r"[A-Z]", password):  
 return False  
  
 if not re.search(r"[$#@]", password):  
 return False  
  
 return True  
  
  
input\_password = input("Enter a password: ")  
  
if validate\_password(input\_password):  
 print("Password is valid.")  
else:  
 print("Password is not valid.")

**5.** def find\_word\_positions(string, target\_word):  
 words = string.split()  
 positions = []  
  
 for i in range(len(words)):  
 if words[i] == target\_word:  
 positions.append(i + 1)  
  
 if positions:  
 return positions  
 else:  
 return False  
  
 input\_string = input("Enter a string of words: ")  
 input\_target = input("Enter the target word: ")  
  
 positions = find\_word\_positions(input\_string, input\_target)  
  
 if positions:  
 print(positions)  
 else:  
 print(False)