Easy Level (1-20)

In [ ]:
```python
# 1. Check if a number is even or odd ?
a1=int(input("Enter a number: "))
if a1%2==0:
    print(a1,"is a even")
else:
    print(a1,"is a odd")
```

In [ ]:
```python
# 2. Check if a person is eligible to vote (age 18 or above)?
a1=int(input("Enter age: "))
if a1>=18:
    print("you are Eligible")
else:
    print("you are Not Eligible")
```

In [ ]:
```python
# 3. Determine if a given year is a leap year or not?
year =int(input("Enter the year: "))
if(year%4 == 0 and year%100 != 0) or (year%400 ==0):
    print(year,"is a leap year")
else:
    print(year,"is not a leap year")
```

In [ ]:
```python
# 4. Check if a number is positive, negative, or zero ?
a1=int(input("Enter a number: "))
if a1>0:
    print("It's a positive number")
elif a1<0:
    print("It's a negative number")
else:
    print("It's a zero")
```

In [ ]:
```python
# 5. Write a program to find the greatest of two numbers ?
a1=int(input("Enter 1st number: "))
a2=int(input("Enter 1st number: "))
if a1>a2:
    print(a1,"is greatest number")
else:
    print(a2,"is greatest number")
```

In [ ]:
```python
# 6. Determine if a number is a multiple of 5 ?
a1=int(input("Enter number: "))
if a1%5==0:
    print("Yes, it's multiple of 5")
else:
    print("No, it's not a multiple of 5")
```

In [ ]:
```python
# 7. Check if a character is a vowel or consonant ?
a1=input("Enter the aplhabet: ")
a2='aeiou'
if a1 in a2 :
    print("It's a vowel")
else:
    print("It's a consonant")
```

In [ ]:
```python
# 8.  Determine if a person is eligible for a senior citizen discount (age 60+)
a1=int(input("Enter age: "))
if a1>=60:
    print("Eligible")
else:
    print("Not Eligible")
```

In [ ]:
```python
# 9. check if a number is a single-digit number
a1=int(input("Enter the number: "))
if 0 <= abs(a1) < 10:
    print("Single digit number")
else:
    print("Not a single digit number")
```

In [ ]:
```python
# 10.  Print "Good Morning" if the time is before 12 PM, otherwise print "Good A
a1=int(input("Enter the number: "))
if a1<12:
    print("Good Morning")
else:
    print("Good Afternoon")
```

In [ ]:
```python
# 11. Check if a string is empty or not ?
s1=input("Enter the string: ")
if  not s1:
    print("String is empty")
else:
    print("String is not empty")
```

In [ ]:
```python
# 12. Verify if a number is a perfect square ?
import math
a1=int(input("Enter the number: "))
if math.isqrt(a1)**2 == a1:
    print("Perfect Square")
else:
    print("Not a Perfect Square")
```

In [ ]:
```python
# 13. Determine if a number is between 1 and 100 ?
a1=int(input("Enter the number: "))
if 1 <= a1 <=100:
    print("within range")
else:
    print("Out of range")
```

In [ ]:
```python
# 14.  Print "Weekend" if the day is Saturday or Sunday; otherwise, print "Weekd
a1=input("Enter the day: ")
if a1 in ['Saturday','Sunday']:
    print("Weekend")
else:
    print("Weekday")
```

In [ ]:
```python
# 15. Find if a given number is exactly divisible by both 3 and 7 ?
a1=int(input("Enter the number: "))
if a1%3==0 and a1%7==0:
    print("Divisible")
else:
    print("Not Divisible")
```

In [ ]:
```
# 16. Check if the sum of two numbers is greater than 100 ?
a1=int(input("Enter first number: "))
a2=int(input("Enter second number: "))
if(a1+a2) > 100:
    print("Sum is greater than 100")
else:
    print("Sum is 100 or less")
```

In [ ]:
```
# 17. Write a program to find the minimum of two numbers ?
a1=int(input("Enter first number: "))
a2=int(input("Enter second number: "))
if a1<a2:
    print(a1,"is minimum")
else:
    print(a2,"is minimum")
```

In [ ]:
```
# 18. Check if a number is divisible by 2 but not by 3 ?
a1=int(input("Enter first number: "))
if a1%2==0 and a1%3!=0:
    print("Divisible by 2 not 3")
else:
    print("Incorrect input")
```

In [ ]:
```
# 19. Determine if a given alphabet is uppercase or lowercase ?
a1=input("Enter the alphabet")
if a1.isupper():
    print("Uppercase")
else:
    print("Lowercase")
```

In [ ]:
```
# 20. Check if a triangle is valid given three side lengths ?
a1=int(input("Enter first number: "))
a2=int(input("Enter second number: "))
a3=int(input("Enter third number: "))
if a1+a2>a3 and a2+a3>a1 and a1+a3>a2:
    print("Valid Triangle")
else:
    print("Invalid Triangle")
```

Medium Level (21-40)

In [ ]:
```
# 21.  Find the largest of three numbers ?
a1=int(input("Enter first number: "))
a2=int(input("Enter second number: "))
a3=int(input("Enter third number: "))
if a1>a2 and a1>a3:
    print(a1,"is largest number")
elif a2>a1 and a2>a3:
    print(a2,"is largest number")
else:
    print(a3,"is largest number")
```

In [ ]:
```
# 22. Determine if a number is a prime number ?
a1=int(input("Enter the number: "))
if a1>1:
```

```
    for i in range(2,a1):
        if a1%i==0:
            print(a1,"is not a prime")
            break;
    else:
        print(a1,"is prime number")
else:
    print(a1,"is not a prime number")
```

In [ ]:
```
# 23. Check if a person is eligible for a driving license
a1=int(input("Enter the age: "))
test_pass=input("Did you pass the test? (yes/no): ").lower()
if a1>=18 and test_pass=="yes":
    print("you are eligible for driving license and passed the test")
else:
    print("you are not eligible for driving license and didn't pass the test")
```

In [ ]:
```
# 24. Determine if a triangle is equilateral, isosceles, or scalene ?
a1=int(input("Enter first number: "))
a2=int(input("Enter second number: "))
a3=int(input("Enter third number: "))
if a1==a2==a3:
    print("Equilateral Triangle")
elif a1==a2 or a2==a3 or a3==a1:
    print("Isosceles Triangle")
else:
    print("Scalene triangle")
```

In [ ]:
```
# 25. Determine if a student passes or fails ?
a1=int(input("Enter marks: "))
if a1>=36:
    print("You are passed")
else:
    print("You are failed")
```

In [ ]:
```
# 26. Check if a number is a palindrome ?
a1=input("Enter number: ")
if a1 == a1[::-1]:
    print("It's a palindrome")
else:
    print("Not a palindrome")
```

In [ ]:
```
# 27. Calculate electricity bill ?
a1=int(input("Enter the units: "))
if a1<=100:
    bill=a1*5
elif a1<=300:
    bill=(100*5)+(a1-100)*10
else:
    bill=(100*5)+(200*10)+(a1-300)*15
print("Total bill: ","₹",bill)
```

In [ ]:
```
# 28. Find the grade of a student?
a1=int(input("Enter marks: "))
if a1>=90:
    print("A Grade")
elif a1>=80:
    print("B Grade")
```

```
elif a1>=50:
    print("C Grade")
elif a1>=40:
    print("D Grade")
else:
    print("E Grade")
```

In [ ]:
```
# 29. Determine if a given date is valid ?
import calendar
day = int(input("Enter day: "))
month = int(input("Enter month: "))
year = int(input("Enter year: "))
if 1 <= month <= 12 and 1 <= day <= calendar.monthrange(year, month)[1]:
    print("Valid date")
else:
    print("Invalid date")
```

In [ ]:
```
# 30. Check if a given time is AM or PM ?
a1 = int(input("Enter day: "))
if a1>12:
    print("PM")
else:
    print("AM")
```

In [ ]:
```
# 31. Check if a number is an Armstrong number ?
a1=input("Enter the number: ")
power = len(a1)
if sum(int(digit) ** power for digit in a1) == int(a1):
    print("Armstrong Number")
else:
    print("Not Armstrong Number")
```

In [ ]:
```
# 32. Determine the type of quadrilateral ?
a1=int(input("Enter the number: "))
a2=int(input("Enter the number: "))
a3=int(input("Enter the number: "))
a4=int(input("Enter the number: "))
if a1==a2==a3==a4:
    print("Square")
elif a1==a3 and a2==a4:
    print("Rectangle")
else:
    print("Quadrilateral")
```

In [ ]:
```
# 33.  Implement a basic calculator ?
a1=float(input("Enter the number: "))
a2=float(input("Enter the number: "))
op=input("Enter any operator from this (+,-,/,*): ")
if op=="+":
    print("Result: ",a1+a2)
elif op=="-":
    print("Result: ",a1-a2)
elif op=="/":
    print("Result: ",a1/a2)
elif op=="*":
    print("Result: ",a1*a2)
else:
    print("Invalid Operation")
```

In [ ]:
```python
# 34. Check if a bank account balance is sufficient for withdrawal ?
withdrawl=float(input("Enter the balance: "))
balance=float(input("Enter the withdrwal amount: "))
if withdrawl>=balance:
    print("Withdrawl Successfull")
else:
    print("Insufficient balance")
```

In [ ]:
```python
# 35. Implement a temperature converter ?
temp=float(input("Enter temperature: "))
unit=input("Enter unit (C/F/K): ").upper()
if unit == "C":
    print("Fahrenheit: ",(temp*9/5)+32)
elif unit == "F":
    print("Celsius: ",(temp-32)*5/9)
elif unit == "K":
    print("Kelvin: ",temp+273.15)
else:
    print("Invalid unit")
```

In [ ]:
```python
# 36. Check if a number lies within a range (50-100) ?
a1=int(input("Enter the number: "))
if a1>=50 and a1<=100: # if 50 <= a1 <= 100:
    print("Within range")
else:
    print("Out of Range")
```

In [ ]:
```python
# 37. Determine if a year is a century year ?
a1=int(input("Enter a year: "))
if a1%100==0:
    print("Century year")
else:
    print("Not a Century year")
```

In [ ]:
```python
# 38. Check if a number is a power of 2 ?
a1=int(input("Enter the number: "))
if a1>0 and (a1&(a1-1)) ==0:
    print("Power of 2")
else:
    print("Not a power of 2")
```

In [ ]:
```python
# 39. Determine how many days a month has ?
month = int(input("Enter month (1-12): "))
year = int(input("Enter year: "))
days = [31, 28 + (1 if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0)
30, 31, 30, 31, 31, 30, 31, 30, 31]
print("Days:", days[month - 1]) # index starts from "0". so we are giving "-1"
```

In [ ]:
```python
# 40.  Validate a password ?
import re
password = input("Enter password: ")
if len(password) >= 8 and re.search(r"[A-Za-z]", password) and re.search(r"\d",
    print("Valid Password")
else:
    print("Invalid Password")
```

Hard Level (41-50)

In [ ]:
```python
# 41. Implement a ticket pricing system ?
age=int(input("Enter age: "))
if age>18:
    print("Ticket Price: ₹ 1000")
elif age>12:
    print("Ticket Price: ₹ 600")
elif age>8:
    print("Ticket Price: ₹ 400")
else:
    print("Free")
```

In [ ]:
```python
# 42. Check if three numbers form a Pythagorean triplet ?
a,b,c=map(int,input("Enter three numbers: ").split())
if a**2 and b**2 == c**2:
    print("Yes, Pythagorean triplet")
else:
    print("No, Cannot be formed")
```

In [ ]:
```python
# 43. Convert a Roman numeral to an integer ? [practice]
def roman_to_int(s):
    roman = {'I': 1, 'V': 5, 'X': 10, 'L': 50, 'C': 100, 'D': 500, 'M': 1000}
    total = 0
    for i in range(len(s)):
        if i > 0 and roman[s[i]] > roman[s[i - 1]]:
            total += roman[s[i]] - 2 * roman[s[i - 1]]
        else:
            total += roman[s[i]]
    return total

num = input("Enter Roman numeral: ").upper()
print("Integer:", roman_to_int(num))
```

In [ ]:
```python
# 44. Determine zodiac sign based on birth date ? [practice]
month = int(input("Enter birth month (1-12): "))
day = int(input("Enter birth day: "))

zodiac = [("Capricorn", 20), ("Aquarius", 19), ("Pisces", 20), ("Aries", 20),
          ("Taurus", 21), ("Gemini", 21), ("Cancer", 22), ("Leo", 22),
          ("Virgo", 22), ("Libra", 23), ("Scorpio", 23), ("Sagittarius", 22), ("

sign = zodiac[month - 1][0] if day <= zodiac[month - 1][1] else zodiac[month][0]
print("Zodiac Sign:", sign)
```

In [ ]:
```python
# 45. Check if a number is a Harshad number ? [practice]
num = int(input("Enter a number: "))
sum_digits = sum(int(digit) for digit in str(num))
if num % sum_digits == 0:
    print("Harshad Number")
else:
    print("Not a Harshad Number")
```

In [ ]:
```python
# 46. Validate an email format ? [practice]
import re
email = input("Enter email: ")
```

```
if re.match(r"^[\w\.-]+@[\w\.-]+\.(com|org|net|edu)$", email):
    print("Valid Email")
else:
    print("Invalid Email")
```

In [ ]:
```
# 47. Check if a knight move in chess is valid ? [practice]
x1, y1 = map(int, input("Enter current position (x y): ").split())
x2, y2 = map(int, input("Enter new position (x y): ").split())

if (abs(x1 - x2), abs(y1 - y2)) in [(2, 1), (1, 2)]:
    print("Valid Knight Move")
else:
    print("Invalid Move")
```

In [ ]:
```
# 48.  Implement a loan eligibility checker ? [practice]
income = int(input("Enter monthly income: "))
credit_score = int(input("Enter credit score: "))
employed = input("Are you employed? (yes/no): ").lower()

if income >= 25000 and credit_score >= 700 and employed == "yes":
    print("Loan Approved")
else:
    print("Loan Denied")
```

In [ ]:
```
# 49. Implement a rock-paper-scissors game ? [practice]
import random
choices = ["rock", "paper", "scissors"]
user = input("Enter rock, paper, or scissors: ").lower()
computer = random.choice(choices)

print("Computer chose:", computer)
if user == computer:
    print("It's a tie!")
elif (user == "rock" and computer == "scissors") or \
     (user == "scissors" and computer == "paper") or \
     (user == "paper" and computer == "rock"):
    print("You win!")
else:
    print("You lose!")
```

In [ ]:
```
# 50. Find the day of the week for a given date (without built-in functions) ? [
def day_of_week(d, m, y):
    if m < 3:
        m += 12
        y -= 1
    k = y % 100
    j = y // 100
    day = (d + (13 * (m + 1)) // 5 + k + (k // 4) + (j // 4) - 2 * j) % 7
    days = ["Saturday", "Sunday", "Monday", "Tuesday", "Wednesday", "Thursday",
    return days[day]

day, month, year = map(int, input("Enter date (DD MM YYYY): ").split())
print("Day of the Week:", day_of_week(day, month, year))
```