**Exercise 1: Simple If Statement**

**Task**: Write a program that checks whether a given number is positive or not. If it is positive, print "The number is positive". Otherwise, print "The number is not positive".

**Exercise 2: Even or Odd**

**Task**: Write a program to check if a number is even or odd.

**Exercise 3: Largest of Three Numbers**

**Task**: Write a program that finds the largest of three given numbers.

**Exercise 4: Grade Classification**

**Task**: Write a program that assigns a grade based on a student's score. The grading scale is as follows:

* A for scores above 90
* B for scores between 80 and 89
* C for scores between 70 and 79
* D for scores between 60 and 69
* F for scores below 60

**Exercise 5: Leap Year Checker**

**Task**: Write a program to check if a year is a leap year. A year is a leap year if:

* It is divisible by 4.
* It is not divisible by 100, unless it is also divisible by 400.

**Exercise 6: Ternary Operator Example**

**Task**: Write a program that checks if a number is positive or negative using the ternary operator. The program should print "Positive" if the number is positive, and "Negative" if the number is negative.

**Exercise 7: Divisible by Both 3 and 5**

**Task**: Write a program that checks if a number is divisible by both 3 and 5. If it is, print "Divisible by both", otherwise print "Not divisible by both".

**Exercise 8: Odd or Even (Advanced)**

**Task**: Write a program that determines whether a given number is odd or even. If the number is odd, additionally check whether it is positive or negative.

**Exercise 9: Voting Eligibility**

**Task**: Write a program that checks if a person is eligible to vote. A person is eligible to vote if they are 18 years or older. The program should prompt the user to enter their age, then print either "You are eligible to vote" or "You are not eligible to vote".

**Exercise 10: Age Group Classification**

**Task**: Write a program that classifies a person into different age groups:

* Child (0-12 years)
* Teenager (13-19 years)
* Adult (20-64 years)
* Senior (65+ years)

The program should print the appropriate age group.

**Exercise 11: Check if a Character is a Vowel or Consonant**

**Task**: Write a program that takes a single character as input and checks if it is a vowel (a, e, i, o, u) or consonant.

**Exercise 12: Divisibility Checker**

**Task**: Write a program that checks if a number is divisible by 3, 5, or both. The program should print:

* "Divisible by 3" if divisible by 3 only,
* "Divisible by 5" if divisible by 5 only,
* "Divisible by both" if divisible by both 3 and 5,
* "Not divisible by 3 or 5" if not divisible by either.

**Exercise 13: Calculate Discount Based on Age**

**Task**: Write a program that calculates the price of a movie ticket based on age. The ticket price is:

* $10 for people 12 years and under (child).
* $15 for people between 13 and 64 years (adult).
* $5 for people 65 years and older (senior).

The program should prompt the user to enter their age and print the ticket price.

**Exercise 14: Sort Numbers Using Decision Constructs**

**Task**: Write a program that takes three numbers and sorts them in ascending order using only if-else decision constructs.

**Exercise 15: Day of the Week**

**Task**: Write a program that prints the day of the week based on a given number (1-7). The program should print:

* 1 = Monday
* 2 = Tuesday
* 3 = Wednesday
* 4 = Thursday
* 5 = Friday
* 6 = Saturday
* 7 = Sunday

**Exercise 16: Check Whether a Year is a Century Year**

**Task**: Write a program that checks whether a year is a century year. A century year is a year that is divisible by 100. The program should print "Century Year" if the year is divisible by 100, and "Not a Century Year" otherwise.

**Exercise 17: Maximum of Three Numbers**

**Task**: Write a program that takes three numbers as input and determines the largest of the three.

**Exercise 18: Leap Year Checker**

**Task**: Write a program that checks if a given year is a leap year. A year is a leap year if:

* It is divisible by 4, but not divisible by 100, or
* It is divisible by 400.

The program should print "Leap year" or "Not a leap year" based on the condition.

**Exercise 19: Calculate Grade**

**Task**: Write a program that calculates the grade based on the score:

* 90 or above: A
* 80-89: B
* 70-79: C
* 60-69: D
* Below 60: F

The program should print the grade corresponding to the score.

**Exercise 20: Positive, Negative, or Zero**

**Task**: Write a program that checks whether a number is positive, negative, or zero.

**Exercise 21: Grade Point Average (GPA)**

**Task**: Write a program that takes the GPA as input and prints the letter grade:

* GPA >= 3.5: A
* GPA >= 3.0 and < 3.5: B
* GPA >= 2.0 and < 3.0: C
* GPA < 2.0: F

**Exercise 22: Even or Odd**

**Task**: Write a program that checks if a number is even or odd.

**Exercise 23: Calculate Discount for Shopping**

**Task**: Write a program that calculates a discount for a shopping cart based on the total amount:

* If the amount is greater than or equal to 100, apply a 20% discount.
* If the amount is between 50 and 99, apply a 10% discount.
* If the amount is below 50, apply no discount.

The program should print the discount and the total after the discount.

**Exercise 24: Check if a Number is Divisible by Both 3 and 5**

**Task**: Write a program that checks if a given number is divisible by both 3 and 5.

**Exercise 25: Find Largest of Four Numbers**

**Task**: Write a program that finds the largest number among four given numbers.

**Exercise 26: Quadratic Equation Solver**

**Task**: Write a program that solves a quadratic equation of the form ax^2 + bx + c = 0 for real values of x, given the values of a, b, and c. The program should handle cases where the equation has no real solutions (discriminant < 0), one real solution (discriminant = 0), or two real solutions (discriminant > 0).

**Exercise 27: Validate Email Format**

**Task**: Write a program that validates whether an email address is in a correct format. The program should check for the following conditions:

* The email must contain exactly one "@" symbol.
* The email must contain at least one dot (".") after the "@" symbol.
* The email must not start or end with a dot.

**Exercise 28: Determine if a Year is a Leap Year**

**Task**: Write a program that takes a year as input and checks whether it is a leap year or not using decision constructs (if-else).

**Exercise 29: Age Category**

**Task**: Write a program that asks for the age of a person and then categorizes the person into one of the following groups:

* "Child" (age <= 12)
* "Teenager" (age between 13 and 19)
* "Adult" (age between 20 and 64)
* "Senior" (age >= 65)

**Exercise 30: Day of the Week**

**Task**: Write a program that asks the user to enter a number between 1 and 7 and then prints the corresponding day of the week (1 for Monday, 7 for Sunday). Handle invalid input properly.

**Exercise 31: Grade Based on Marks in Multiple Subjects**

**Task**: Write a program that takes the marks of three subjects as input and calculates the average. The program should then print the grade based on the average:

* Average >= 90: A
* Average >= 75 and < 90: B
* Average >= 60 and < 75: C
* Average < 60: D