Chapter 2

Exercise

1 State that a program calculates the product of three integers

To calculate the product of three integers, we can write a program in a programming language that takes three integer inputs and multiplies them together using the multiplication operator. Here's a simple example in Python:

```python
# Taking input from user

num1 = int(input("Enter first number: "))

num2 = int(input("Enter second number: "))

num3 = int(input("Enter third number: "))


# Multiplying the three numbers

product = num1 * num2 * num3


# Printing the result

print("The product of the three numbers is:", product)
```

This program prompts the user to enter three integer values, multiplies them together using the * operator, and stores the result in the variable product. Finally, it prints out the result using the print() function.

2 Declare the variable X, Y, Z and result to be of type int

an example of how to declare variables X, Y, Z, and result to be of type int in Java:

```java
int X;

int Y;

int Z;

int result;
```

In this example, we declare four variables X, Y, Z, and result of type int using the int keyword. These variables can be used to store integer values in a Java program. You can also initialize these variables to a specific value like this:

```
int X = 5;

int Y = 10;

int Z = 15;

int result = 0;
```

In this example, we initialize the variables X, Y, and Z to the integer values 5, 10, and 15, respectively. We also initialize the variable result to 0.

3 Prompt the user to enter three integers

here's an example of how to prompt the user to enter three integers in Python:

```python
x = int(input("Enter the first integer: "))

y = int(input("Enter the second integer: "))

z = int(input("Enter the third integer: "))
```

In this example, we use the input() function to prompt the user to enter an integer value. The int() function is used to convert the user input from a string to an integer. We store the user input in the variables x, y, and z.

When the program runs, the user will see three prompts asking them to enter an integer value. After the user enters a value and presses enter, the program will convert the input to an integer and store it in the corresponding variable.

4 Read three integers from the keyboard and store them in the variables x, y and z

an example of how to read three integers from the keyboard and store them in the variables x, y, and z in Java:

```java
import java.util.Scanner;
```

```java
public class Main {

  public static void main(String[] args) {

    Scanner input = new Scanner(System.in);


    System.out.print("Enter the first integer: ");

    int x = input.nextInt();


    System.out.print("Enter the second integer: ");

    int y = input.nextInt();


    System.out.print("Enter the third integer: ");

    int z = input.nextInt();


    System.out.println("You entered: " + x + ", " + y + ", " + z);

  }

}
```

In this example, we first import the Scanner class from the java.util package, which allows us to read input from the keyboard. We then create a new Scanner object called input.

We use the nextInt() method of the Scanner class to read an integer value from the keyboard and store it in the variables x, y, and z. The System.out.print() method is used to display a prompt to the user, asking them to enter a value.

Finally, we use the System.out.println() method to display the values of x, y, and z that the user entered.

When the program runs, the user will see three prompts asking them to enter an integer value. After the user enters a value and presses enter, the program will store the input in the corresponding variable.

5 Compute the product of three integers contained in variables x, y and z and assign the result to the variable result

An example of how to compute the product of three integers contained in variables x, y, and z, and assign the result to the variable result in Java:

```
int x = 5;

int y = 10;

int z = 15;


int result = x * y * z;


System.out.println("The product of " + x + ", " + y + ", and " + z + " is " + result);
```

In this example, we first initialize the variables x, y, and z to the integer values 5, 10, and 15, respectively.

We then compute the product of x, y, and z by multiplying them together using the * operator, and store the result in the variable result.

Finally, we use the System.out.println() method to display the values of x, y, and z, and the result of the multiplication.

When the program runs, the output will be:

The product of 5, 10, and 15 is 750

Note that in a real program, you would read the values of x, y, and z from user input or from some other

source, rather than hard-coding them in the program.

6 Print "the product is" followed by the value of the variable result

Here's an example in Python:

```python
print("The product is", result)
```

This will print the string "The product is" followed by the value of the variable result. If result is equal to 10, for example, the output would be:

```
The product is 10
```

Exercise 3

1 Write a program that accepts two integers and display the sum, difference, product and division of two numbers the program should also state the greater and smaller number

an example program in Python that accepts two integers from the user, calculates their sum, difference, product, and division, and displays the results, as well as the greater and smaller number:

```python
# Accept two integers from the user
num1 = int(input("Enter the first integer: "))
num2 = int(input("Enter the second integer: "))

# Calculate the sum, difference, product, and division of the two numbers
sum = num1 + num2
diff = num1 - num2
prod = num1 * num2
div = num1 / num2
```

```python
# Determine the greater and smaller number

if num1 > num2:

    greater = num1

    smaller = num2

else:

    greater = num2

    smaller = num1


# Display the results

print("The sum of the two numbers is:", sum)

print("The difference of the two numbers is:", diff)

print("The product of the two numbers is:", prod)

print("The division of the two numbers is:", div)

print("The greater number is:", greater)

print("The smaller number is:", smaller)
```

When you run this program, it will prompt the user to enter two integers, and then it will calculate and display the sum, difference, product, and division of the two numbers, as well as the greater and smaller number. Here's an example of what the output might look like:

Enter the first integer: 10

Enter the second integer: 5

The sum of the two numbers is: 15

The difference of the two numbers is: 5

The product of the two numbers is: 50

The division of the two numbers is: 2.0

The greater number is: 10

The smaller number is: 5

2 Write a program that calculate and display the circumference of a circle (c=2#r)

an example program in Python that calculates and displays the circumference of a circle:

```
# Accept the radius of the circle from the user
radius = float(input("Enter the radius of the circle: "))


# Calculate the circumference of the circle
circumference = 2 * 3.14159 * radius


# Display the circumference of the circle
print("The circumference of the circle is:", circumference)
```

When you run this program, it will prompt the user to enter the radius of the circle, and then it will calculate and display the circumference of the circle. Here's an example of what the output might look like:

Enter the radius of the circle: 5

The circumference of the circle is: 31.4159

4 Write a program to solve a quadratic question

an example program in Python that solves a quadratic equation of the form $ax^2 + bx + c = 0$:

```
import math
```

```python
# Accept the coefficients of the quadratic equation from the user
a = float(input("Enter the coefficient of x^2: "))
b = float(input("Enter the coefficient of x: "))
c = float(input("Enter the constant term: "))


# Calculate the discriminant of the quadratic equation
discriminant = b**2 - 4*a*c


# Check if the discriminant is positive, negative, or zero
if discriminant > 0:
    # If the discriminant is positive, there are two real roots
    root1 = (-b + math.sqrt(discriminant)) / (2*a)
    root2 = (-b - math.sqrt(discriminant)) / (2*a)
    print("The roots of the quadratic equation are:", root1, "and", root2)
elif discriminant == 0:
    # If the discriminant is zero, there is one real root
    root = -b / (2*a)
    print("The root of the quadratic equation is:", root)
else:
    # If the discriminant is negative, there are two complex roots
    real_part = -b / (2*a)
    imag_part = math.sqrt(-discriminant) / (2*a)
    print("The roots of the quadratic equation are:", real_part, "+", imag_part, "i and", real_part, "-", imag_part, "i")
```

When you run this program, it will prompt the user to enter the coefficients of the quadratic equation, and then it will calculate and display the roots of the equation. If the discriminant is positive, there are two real roots. If the discriminant is zero, there is one real root. If the discriminant is negative, there are two complex roots. Here's an example of what the output might look like:

Enter the coefficient of x^2: 2

Enter the coefficient of x: - 5

Enter the constant term: 3

The roots of the quadratic equation are: 2.5 and 0.6

Chapter 3

Exercise

1 Write a program to accept any character from keyboard and display whether it is vowel or not

an example program in Python that accepts a character from the user and determines whether it is a vowel or not:

```
# Accept a character from the user

ch = input("Enter a character: ")


# Define a list of vowels

vowels = ['a', 'e', 'i', 'o', 'u']


# Check if the entered character is a vowel or not

if ch in vowels:

    print(ch, "is a vowel")

else:

    print(ch, "is not a vowel")
```

In this program, we first accept a character from the user using the input() function and store it in the variable ch. We then define a list of vowels containing the characters 'a', 'e', 'i', 'o', and 'u'.

Next, we check if the entered character is in the list of vowels using the in operator. If the character is in the list, we print a message saying that it is a vowel. Otherwise, we print a message saying that it is not a vowel.

2Write a program that gives grade based on the following using if else statement

70 - 74 》 B

65 - 69 》 B-

60 - 64 》 C

<50 - F

example program in Python that prompts the user to enter their score and outputs their corresponding grade based on the criteria you provided:

```
score = int(input("Enter your score: "))


if score >= 70 and score <= 74:

   print("Your grade is B")

elif score >= 65 and score <= 69:

   print("Your grade is B-")

elif score >= 60 and score <= 64:

   print("Your grade is C")

elif score < 50:

   print("Your grade is F")

else:

   print("Sorry, your score does not meet the criteria for any grade.")
```

This program first prompts the user to enter their score using the input() function and converts the input to an integer using the int() function. Then, it uses a series of if and elif statements to check if the score falls within the ranges for each grade. If the score meets the criteria for a grade, the program prints out the corresponding grade using the print() function. If the score is less than 50, the program outputs an F grade. If the score does not meet the

3 Write a program that gives grade based on the following scale using if-else statement

70-64 》 B

65-69 》 B-

60-64 》 C+

50-59 》 C

<50 F

an example program in Python that accepts a score from the user and assigns a grade based on the scale provided:

```
# Accept the score from the user

score = int(input("Enter the score: "))


# Assign a grade based on the score
if score >= 70:

    grade = "B"
elif score >= 65:

    grade = "B-"
elif score >= 60:

    grade = "C+"
elif score >= 50:

    grade = "C"
else:
```

```python
    grade = "F"
```

```python
# Print the grade
print("The grade is:", grade)
```

In this program, we first accept a score from the user using the input() function and convert it to an integer using the int() function. We then use a series of if-elif-else statements to assign a grade based on the score.

If the score is greater than or equal to 70, we assign a grade of "B". If the score is between 65 and 69, we assign a grade of "B-". If the score is between 60 and 64, we assign a grade of "C+". If the score is between 50 and 59, we assign a grade of "C". If the score is less than 50, we assign a grade of "F".

Finally, we print the grade using the print() function.

3 Write a program that calculates sum of numbers from 1 to 100

an example program in Python that calculates the sum of the numbers from 1 to 100:

```python
# Initialize the sum variable to 0
sum = 0
```

```python
# Loop through the numbers from 1 to 100 and add them to the sum
for i in range(1, 101):
    sum += i
```

```python
# Print the sum
print("The sum of the numbers from 1 to 100 is:", sum)
```

In this program, we first initialize a variable called sum to 0. We then use a for loop to loop through the numbers from 1 to 100 using the range() function. For each number, we add it to the sum variable using the += operator.

Finally, we print the sum using the print() function. The output of this program should be:

The sum of the numbers from 1 to 100 is: 5050

This is because the sum of the numbers from 1 to 100 is 1 + 2 + 3 + … + 99 + 100, which is equal to 5050.

4 Write a program that displays numbers between 0- 100 that are divisible by 2, 3 and 5. the number displayed should be those that can be divided by 2, 3 and 5 without reminder

an example program in Python that displays the numbers between 0 and 100 that are divisible by 2, 3, and 5 without remainder:

```
# Loop through the numbers from 0 to 100

for i in range(101):

    # Check if the number is divisible by 2, 3, and 5 without remainder

    if i % 2 == 0 and i % 3 == 0 and i % 5 == 0:

        # If it is, print the number

        print(i)
```

In this program, we use a for loop to loop through the numbers from 0 to 100 using the range() function. For each number, we check if it is divisible by 2, 3, and 5 without remainder using the modulo operator (%).

If the number is divisible by 2, 3, and 5 without remainder, we print it using the print() function.

The output of this program should be:

0

30

60

90

These are the only numbers between 0 and 100 that are divisible by 2, 3, and 5 without remainder.

5 Write a program that calculates factorial for loop, while loop and do while loops. the program should accept the number and then perform the calculation of the factorial

Sure, here's an example program in Python that calculates the factorial of a number using a for loop, a while loop, and a do-while loop:

```
# Accept the number from the user

num = int(input("Enter a number: "))


# Calculate factorial using a for loop

factorial = 1

for i in range(1, num+1):

    factorial *= i

print("Factorial using a for loop:", factorial)


# Calculate factorial using a while loop

factorial = 1
```

```
i = 1

while i <= num:

    factorial *= i

    i += 1

print("Factorial using a while loop:", factorial)


# Calculate factorial using a do-while loop

factorial = 1

i = 1

while True:

    factorial *= i

    i += 1

    if i > num:

        break

print("Factorial using a do-while loop:", factorial)
```

In this program, we first accept a number from the user using the input() function and convert it to an integer using the int() function. We then calculate the factorial of the number using a for loop, a while loop, and a do-while loop.

In the for loop, we initialize a variable called factorial to 1 and use a range() function to loop through the numbers from 1 to num. For each number, we multiply it with the factorial variable using the *= operator.

In the while loop, we initialize the factorial and i variables to 1. We then use a while loop to loop through the numbers from 1 to num. For each number, we multiply it with the factorial variable and increment the i variable using the += operator.

In the do-while loop, we initialize the factorial and i variables to 1. We then use a while loop to loop

through the numbers from 1 to num. For each number, we multiply it with the factorial variable and increment the i variable using the += operator. We also use a break statement to exit the loop when i becomes greater than num.

Finally, we print the factorial using the print() function. The output of this program should look something like this:

Enter a number: 5

Factorial using a for loop: 120

Factorial using a while loop: 120

Factorial using a do-while loop:

6. Write while loop that prints the average of numbers from 1 to 10

Sure, I can help you with that! Here's the code:

```
total = 0
count = 0
num = 1

while num <= 10:
    total += num
    count += 1
    num += 1

average = total / count
print("The average of numbers from 1 to 10 is:", average)
```

In this code, we first initialize total and count to 0, and num to 1. Then we enter a while loop that runs as long as num is less than or equal to 10.

Within the loop, we add num to total, increment count by 1, and increment num by 1. This allows us to keep track of the sum of

the numbers and the number of items that we have added.

After we exit the loop, we calculate the average by dividing the total by the count. Finally, we print out the result using the print() function.