Below are the solutions for the Lab Exercises:

1) Python program to perform basic arithmetic operations:

```python

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

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

print("Select operation:")

print("1. Add")

print("2. Subtract")

print("3. Multiply")

print("4. Divide")

choice = int(input("Enter choice (1/2/3/4): "))

if choice == 1:

print("Result:", num1 + num2)

elif choice == 2:

print("Result:", num1 - num2)

elif choice == 3:

print("Result:", num1 \* num2)

elif choice == 4:

if num2 != 0:

print("Result:", num1 / num2)

else:

print("Cannot divide by zero")

else:

print("Invalid choice")

```

2) Python program to check leap year:

```python

year = int(input("Enter 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")

```

3) Python program to convert temperature from centigrade to Fahrenheit:

```python

centigrade = float(input("Enter temperature in centigrade: "))

fahrenheit = (centigrade \* 9/5) + 32

print("Temperature in Fahrenheit:", fahrenheit)

```

4) Python program to add two times:

```python

hours1, minutes1, seconds1 = map(int, input("Enter first time (hh:mm:ss): ").split(':'))

hours2, minutes2, seconds2 = map(int, input("Enter second time (hh:mm:ss): ").split(':'))

total\_seconds = (hours1 + hours2) \* 3600 + (minutes1 + minutes2) \* 60 + (seconds1 + seconds2)

final\_hours = total\_seconds // 3600

final\_minutes = (total\_seconds % 3600) // 60

final\_seconds = total\_seconds % 60

print("Sum of times:", final\_hours, "hours", final\_minutes, "minutes", final\_seconds, "seconds")

```

5) Python program to check if a number is Armstrong:

```python

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

order = len(str(number))

sum = 0

temp = number

while temp > 0:

digit = temp % 10

sum += digit \*\* order

temp //= 10

if number == sum:

print(number, "is an Armstrong number")

else:

print(number, "is not an Armstrong number")

```

6) Python program to find factors of a number:

```python

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

print("Factors of", number, "are:")

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

if number % i == 0:

print(i)

```

7) Python program to print even numbers between 100 to 200:

```python

print("Even numbers between 100 to 200:")

for i in range(100, 201):

if i % 2 == 0:

print(i)

```

8) Python program to find LCM of two numbers:

```python

def gcd(x, y):

while(y):

x, y = y, x % y

return x

def lcm(x, y):

return (x \* y) // gcd(x, y)

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

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

print("LCM of", num1, "and", num2, "is:", lcm(num1, num2))

```

9) Python program to find distance between two coordinates:

```python

import math

x1, y1 = map(float, input("Enter coordinates of first point (x1 y1): ").split())

x2, y2 = map(float, input("Enter coordinates of second point (x2 y2): ").split())

distance = math.sqrt((x2 - x1)\*\*2 + (y2 - y1)\*\*2)

print("Distance between the points:", distance)

```

10) Python program to find multiplication table of a number:

```python

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

print("Multiplication table of", num)

for i in range(1, 11):

print(num, "x", i, "=", num\*i)

```

11) Python program to find volume and surface area of cylinder:

```python

import math

radius = float(input("Enter radius of cylinder: "))

height = float(input("Enter height of cylinder: "))

volume = math.pi \* radius\*\*2 \* height

surface\_area = 2 \* math.pi \* radius \* (radius + height)

print("Volume of cylinder:", volume)

print("Surface area of cylinder:", surface\_area)

```

12) Python program to find roots of a quadratic equation:

```python

import cmath

a = float(input("Enter coefficient a: "))

b = float(input("Enter coefficient b: "))

c = float(input("Enter coefficient c: "))

d = (b\*\*2) - (4\*a\*c)

root1 = (-b - cmath.sqrt(d)) / (2\*a)

root2 = (-b + cmath.sqrt(d)) / (2\*a)

print("Roots of the equation are:", root1, "and", root2)

```

13) Python program to calculate SGPA and CGPA:

```python

# Define function to calculate grade from marks

def calculate\_grade(marks):

if marks >= 90:

return 'S'

elif 80 <= marks < 90:

return 'A'

elif 70 <= marks < 80:

return 'B'

elif 60 <= marks < 70:

return 'C'

elif 50 <= marks < 60:

return 'D'

elif 40 <= marks < 50:

return 'E'

else:

return 'F'

# Define function to calculate SGPA

def calculate\_sgpa(credits, marks\_list):

total\_credits = sum(credits)

total\_grade\_points = sum([credits[i] \* calculate\_grade\_point(marks\_list[i]) for i in range(len(marks\_list))])

sgpa = total\_grade\_points / total\_credits

return sgpa

# Define function to calculate CGPA

def calculate\_cgpa(sgpa\_list):

return sum(sgpa\_list) / len(sgpa\_list)

# Define function to convert grade to grade points

def calculate\_grade\_point(marks):

if marks >= 90:

return 10

elif 80 <= marks < 90:

return 9

elif 70 <= marks < 80:

return 8

elif 60 <= marks < 70:

return 7

elif 50 <= marks < 60:

return 6

elif 40 <= marks < 50:

return 5

else:

return 0

# Define function to print grade

def print\_grade(marks):

grade = calculate\_grade(marks)

print("Grade

:", grade)

# Define function to print SGPA and CGPA

def print\_result(sgpa\_list, cgpa):

print("SGPA for each semester:")

for i, sgpa in enumerate(sgpa\_list, start=1):

print("Semester {}: {:.2f}".format(i, sgpa))

print("Overall CGPA: {:.2f}".format(cgpa))

# Main program

def main():

credits = [4, 4, 4, 3, 3] # Credits for each subject

sgpa\_list = [] # List to store SGPA for each semester

for i in range(1, 3): # For 2 semesters

marks\_list = []

print("Enter marks for Semester", i)

for j in range(1, 6): # For 5 courses

marks = int(input("Enter marks for Course {}: ".format(j)))

marks\_list.append(marks)

print\_grade(marks)

sgpa = calculate\_sgpa(credits, marks\_list)

sgpa\_list.append(sgpa)

cgpa = calculate\_cgpa(sgpa\_list)

print\_result(sgpa\_list, cgpa)

if \_\_name\_\_ == "\_\_main\_\_":

main()

```

14) Python program to check attendance:

```python

classes\_held = int(input("Enter number of classes held: "))

classes\_attended = int(input("Enter number of classes attended: "))

attendance\_percentage = (classes\_attended / classes\_held) \* 100

print("Percentage of classes attended:", attendance\_percentage)

if attendance\_percentage >= 70:

print("You are allowed to sit in the exam.")

else:

print("You are not allowed to sit in the exam.")

```

15) Python program to calculate bonus:

```python

salary = float(input("Enter salary: "))

years\_of\_service = int(input("Enter years of service: "))

if years\_of\_service > 5:

bonus = 0.10 \* salary

print("Net bonus amount:", bonus)

else:

print("No bonus")

```

These programs should help you practice Python programming with various concepts. Let me know if you need further assistance!

Hw

Here are the solutions to the lab exercises:

1) Conversion of Meter to Kilometer and Meter:

```python

# Input from user

meter = int(input("Enter quantity in meters: "))

# Conversion

kilometer = meter // 1000

remaining\_meter = meter % 1000

# Output

print(f"{meter} meters = {kilometer} Km and {remaining\_meter} meter.")

```

2) Sum of Prime Numbers between 1 to n:

```python

# Input from user

n = int(input("Enter the value of n: "))

# Function to check prime number

def is\_prime(num):

if num < 2:

return False

for i in range(2, int(num\*\*0.5) + 1):

if num % i == 0:

return False

return True

# Sum of prime numbers

prime\_sum = 0

for num in range(2, n+1):

if is\_prime(num):

prime\_sum += num

# Output

print("Sum of prime numbers between 1 to", n, "is", prime\_sum)

```

3) Reverse of a Number:

```python

# Input from user

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

# Reversing the number

reverse = 0

while number > 0:

digit = number % 10

reverse = reverse \* 10 + digit

number //= 10

# Output

print("Reverse of the number:", reverse)

```

4) Decimal to Base Conversion:

```python

# Input from user

decimal\_number = int(input("Enter a decimal number: "))

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

# Conversion

result = ""

while decimal\_number > 0:

remainder = decimal\_number % base

result = str(remainder) + result

decimal\_number //= base

# Output

print("Equivalent number in base", base, ":", result)

```

5) Sum of the Series:

```python

# Input from user

n = int(input("Enter the value of n: "))

# Calculation of sum

total\_sum = 0

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

inner\_sum = 0

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

inner\_sum += j

total\_sum += inner\_sum

# Output

print("Sum of the series:", total\_sum)

```