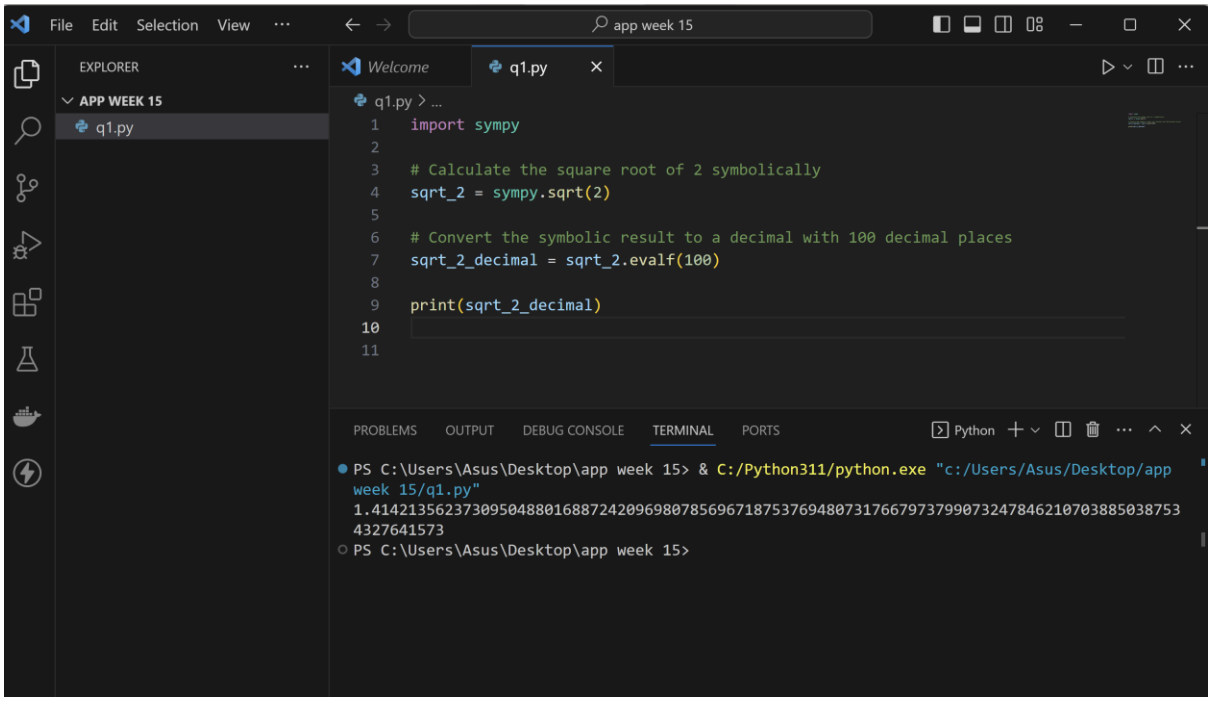
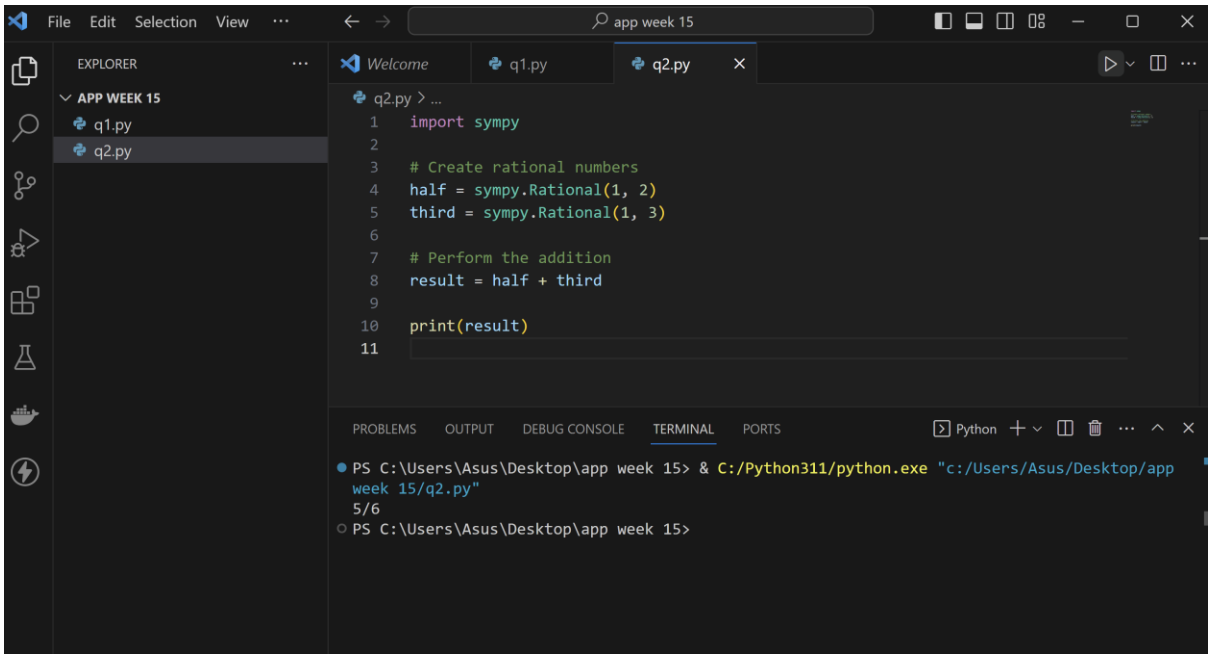
APP WEEK 15

SYMBOLIC PROGRAMMING PARADIGM

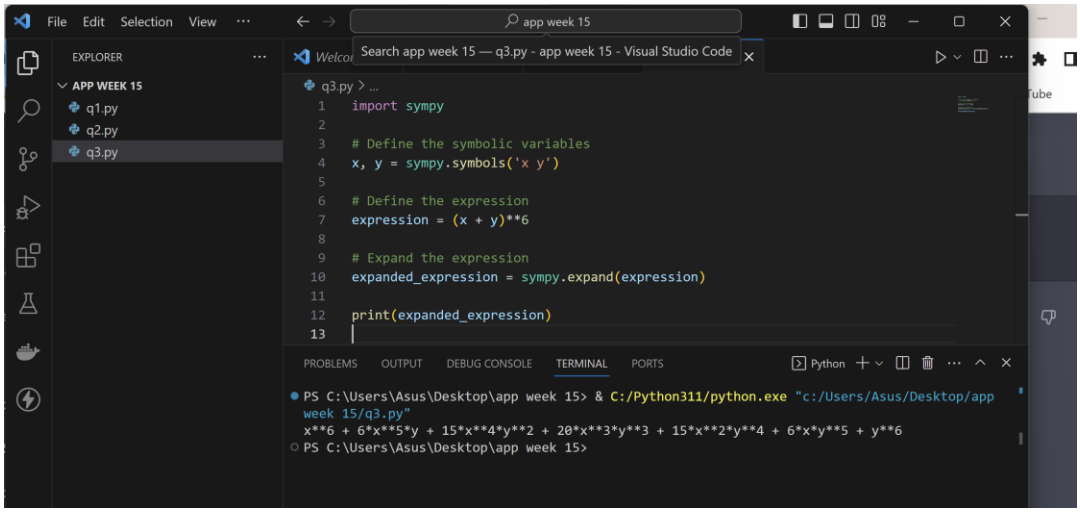
Q1)



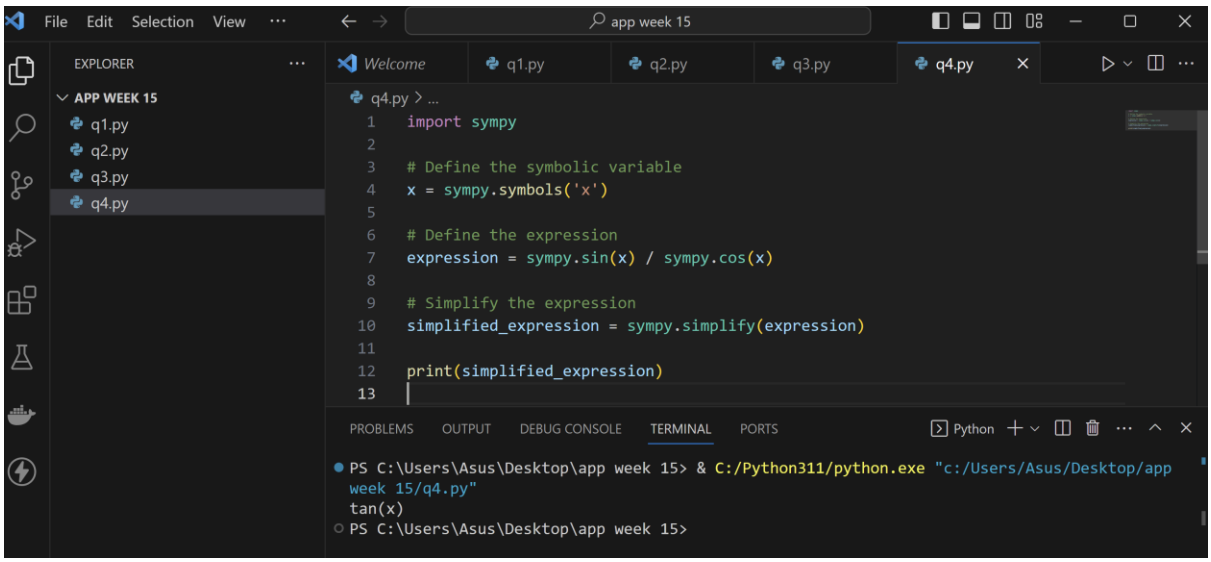
Q2)



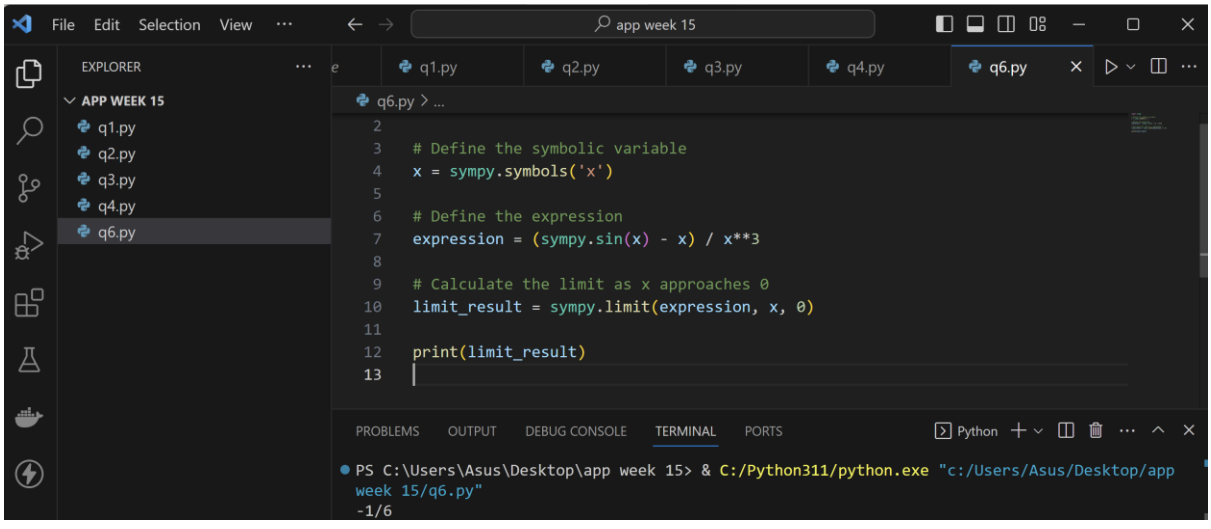
Q3)


File Edit Selection View
app week 15
Search app week 15 — q3.py - app week 15 - Visual Studio Code
EXPLORER
APP WEEK 15
q1.py
q2.py
q3.py
import sympy
# Define the symbolic variables
x, y = sympy.symbols('x y')
# Define the expression
expression = (x + y)**6
# Expand the expression
expanded_expression = sympy.expand(expression)
print(expanded_expression)
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Python
PS C:\Users\Asus\Desktop\app week 15> & C:/Python311/python.exe "c:/Users/Asus/Desktop/app week 15/q3.py"
x**6 + 6*x**5*y + 15*x**4*y**2 + 20*x**3*y**3 + 15*x**2*y**4 + 6*x*y**5 + y**6
PS C:\Users\Asus\Desktop\app week 15>

Q4)


File Edit Selection View
app week 15
EXPLORER
APP WEEK 15
q1.py
q2.py
q3.py
q4.py
Welcome
q4.py
import sympy
# Define the symbolic variable
x = sympy.symbols('x')
# Define the expression
expression = sympy.sin(x) / sympy.cos(x)
# Simplify the expression
simplified_expression = sympy.simplify(expression)
print(simplified_expression)
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Python
PS C:\Users\Asus\Desktop\app week 15> & C:/Python311/python.exe "c:/Users/Asus/Desktop/app week 15/q4.py"
tan(x)
PS C:\Users\Asus\Desktop\app week 15>

Q5)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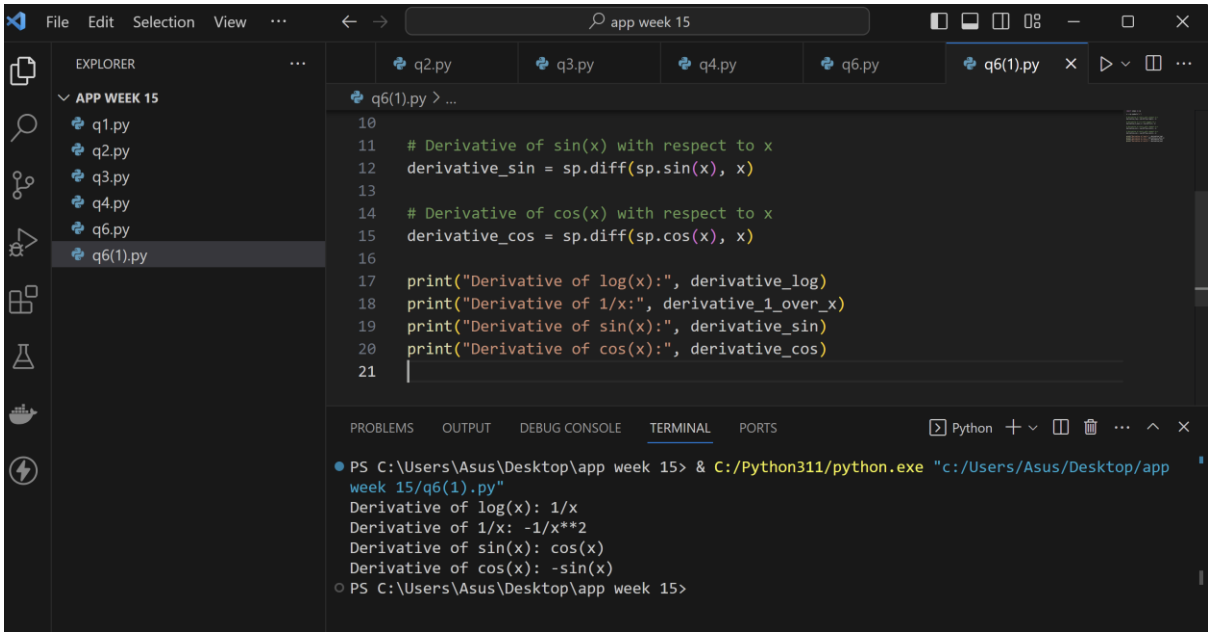
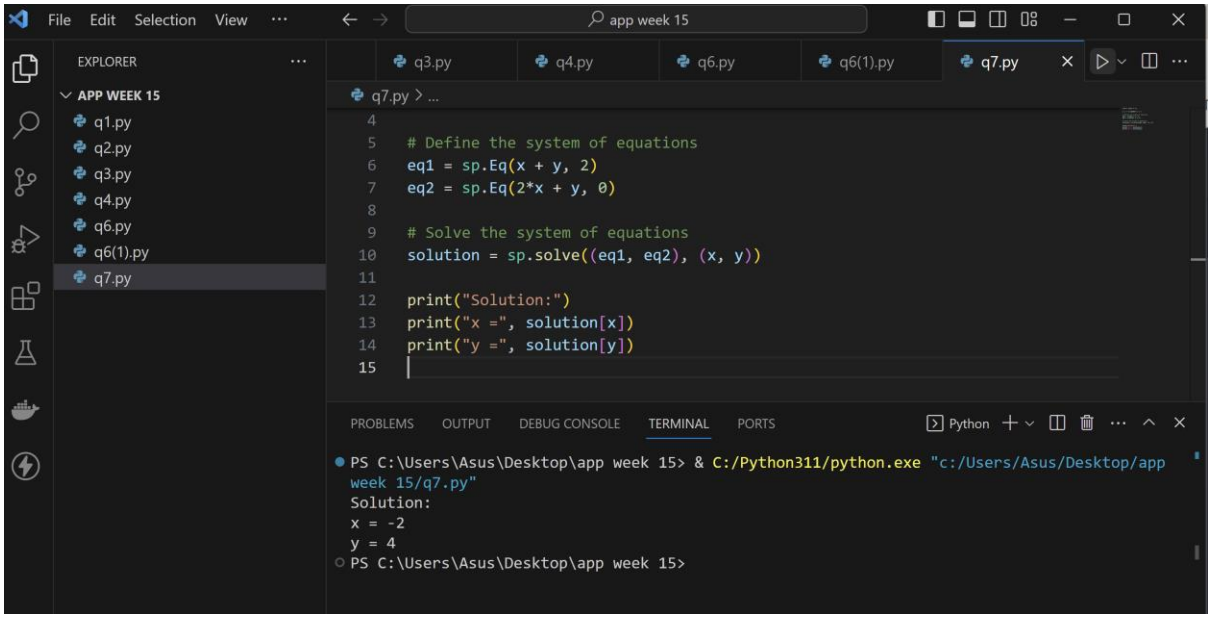
app week 15
EXPLORER
APP WEEK 15
q1.py
q2.py
q3.py
q4.py
q6.py
q6.py
# Define the symbolic variable
x = sympy.symbols('x')
# Define the expression
expression = (sympy.sin(x) - x) / x**3
# Calculate the limit as x approaches 0
limit_result = sympy.limit(expression, x, 0)
print(limit_result)
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Python
PS C:\Users\Asus\Desktop\app week 15> & C:/Python311/python.exe "c:/Users/Asus/Desktop/app week 15/q6.py"
-1/6

Q6)


File Edit Selection View
app week 15
EXPLORER
APP WEEK 15
q1.py
q2.py
q3.py
q4.py
q6.py
q6(1).py
q2.py
q3.py
q4.py
q6.py
q6(1).py
q6(1).py > ...
10
11 # Derivative of sin(x) with respect to x
12 derivative_sin = sp.diff(sp.sin(x), x)
13
14 # Derivative of cos(x) with respect to x
15 derivative_cos = sp.diff(sp.cos(x), x)
16
17 print("Derivative of log(x):", derivative_log)
18 print("Derivative of 1/x:", derivative_1_over_x)
19 print("Derivative of sin(x):", derivative_sin)
20 print("Derivative of cos(x):", derivative_cos)
21
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Python
PS C:\Users\Asus\Desktop\app week 15> & C:/Python311/python.exe "c:/Users/Asus/Desktop/app week 15/q6(1).py"
Derivative of log(x): 1/x
Derivative of 1/x: -1/x**2
Derivative of sin(x): cos(x)
Derivative of cos(x): -sin(x)
PS C:\Users\Asus\Desktop\app week 15>

Q7)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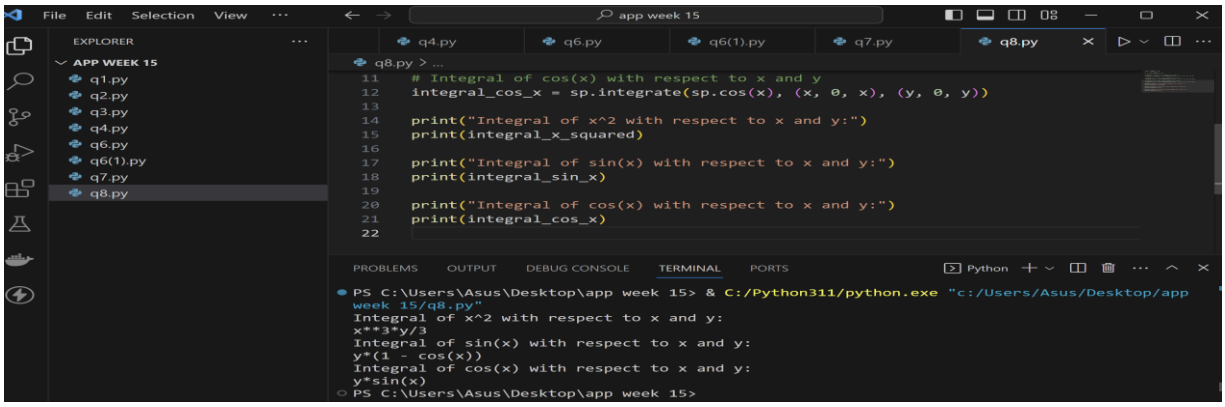
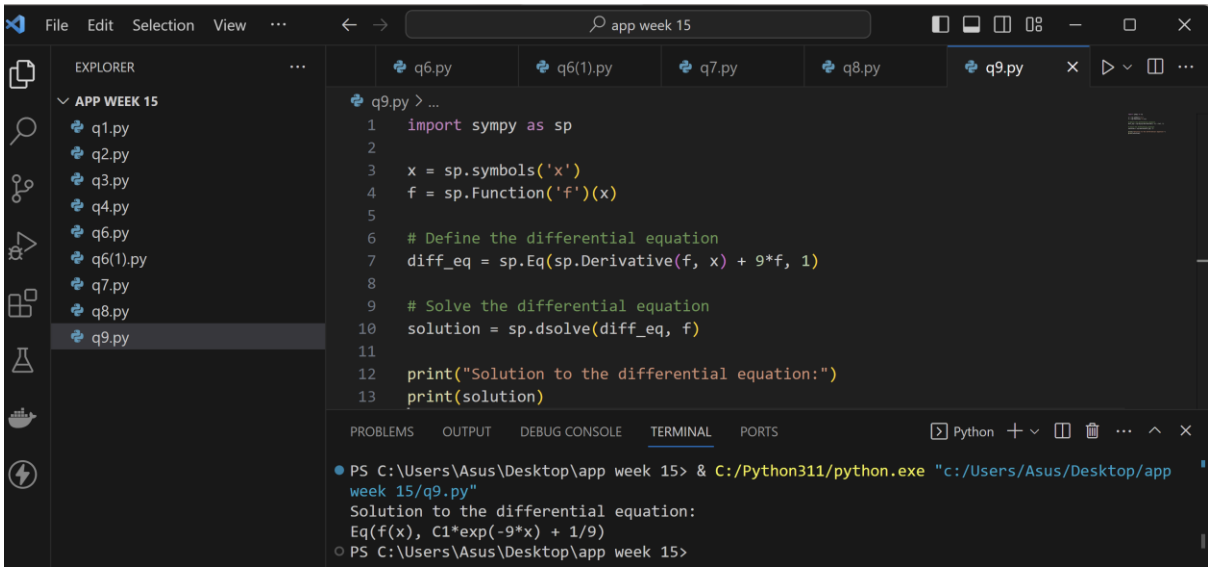
app week 15
EXPLORER
APP WEEK 15
q1.py
q2.py
q3.py
q4.py
q6.py
q6(1).py
q7.py
q3.py
q4.py
q6.py
q6(1).py
q7.py
q7.py > ...
4
5 # Define the system of equations
6 eq1 = sp.Eq(x + y, 2)
7 eq2 = sp.Eq(2*x + y, 0)
8
9 # Solve the system of equations
10 solution = sp.solve((eq1, eq2), (x, y))
11
12 print("Solution:")
13 print("x =", solution[x])
14 print("y =", solution[y])
15
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Python
PS C:\Users\Asus\Desktop\app week 15> & C:/Python311/python.exe "c:/Users/Asus/Desktop/app week 15/q7.py"
Solution:
x = -2
y = 4
PS C:\Users\Asus\Desktop\app week 15>

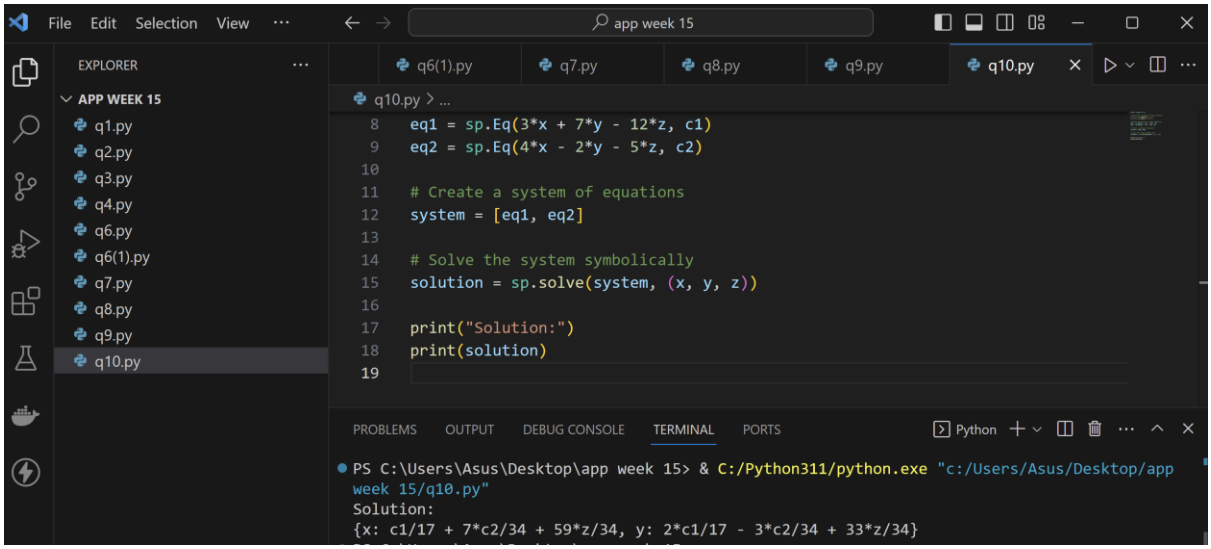
Q8)


File Edit Selection View
app week 15
EXPLORER
APP WEEK 15
q1.py
q2.py
q3.py
q4.py
q6.py
q6(1).py
q7.py
q8.py
q4.py
q6.py
q6(1).py
q7.py
q8.py
q8.py > ...
11 # Integral of cos(x) with respect to x and y
12 integral_cos_x = sp.integrate(sp.cos(x), (x, 0, x), (y, 0, y))
13
14 print("Integral of x^2 with respect to x and y:")
15 print(integral_x_squared)
16
17 print("Integral of sin(x) with respect to x and y:")
18 print(integral_sin_x)
19
20 print("Integral of cos(x) with respect to x and y:")
21 print(integral_cos_x)
22
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Python
PS C:\Users\Asus\Desktop\app week 15> & C:/Python311/python.exe "c:/Users/Asus/Desktop/app week 15/q8.py"
Integral of x^2 with respect to x and y:
x**3*y/3
Integral of sin(x) with respect to x and y:
y*(1 - cos(x))
Integral of cos(x) with respect to x and y:
y*sin(x)
PS C:\Users\Asus\Desktop\app week 15>

Q9)


File Edit Selection View
app week 15
EXPLORER
APP WEEK 15
q1.py
q2.py
q3.py
q4.py
q6.py
q6(1).py
q7.py
q8.py
q9.py
q6.py
q6(1).py
q7.py
q8.py
q9.py
q9.py > ...
1 import sympy as sp
2
3 x = sp.symbols('x')
4 f = sp.Function('f')(x)
5
6 # Define the differential equation
7 diff_eq = sp.Eq(sp.Derivative(f, x) + 9*f, 1)
8
9 # Solve the differential equation
10 solution = sp.dsolve(diff_eq, f)
11
12 print("Solution to the differential equation:")
13 print(solution)
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Python
PS C:\Users\Asus\Desktop\app week 15> & C:/Python311/python.exe "c:/Users/Asus/Desktop/app week 15/q9.py"
Solution to the differential equation:
Eq(f(x), C1*exp(-9*x) + 1/9)
PS C:\Users\Asus\Desktop\app week 15>

Q10)


File Edit Selection View
app week 15
EXPLORER
APP WEEK 15
q1.py
q2.py
q3.py
q4.py
q6.py
q6(1).py
q7.py
q8.py
q9.py
q10.py
q10.py > ...
8 eq1 = sp.Eq(3*x + 7*y - 12*z, c1)
9 eq2 = sp.Eq(4*x - 2*y - 5*z, c2)
10
11 # Create a system of equations
12 system = [eq1, eq2]
13
14 # Solve the system symbolically
15 solution = sp.solve(system, (x, y, z))
16
17 print("Solution:")
18 print(solution)
19
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Python
PS C:\Users\Asus\Desktop\app week 15> & C:/Python311/python.exe "c:/Users/Asus/Desktop/app week 15/q10.py"
Solution:
{x: c1/17 + 7*c2/34 + 59*z/34, y: 2*c1/17 - 3*c2/34 + 33*z/34}