Tutorial 02

Guided Practice Tasks

Task to be done in IDLE Shell:

Arithmetic Operators

1. **Calculate Expressions:** Evaluate the following expressions in Python and note down the results:
    - **8 + 2 * 5**
    - **(8 + 2) * 5**
    - **20 / 4**
    - **20 // 3**
    - **20 % 3**
    - **2 ** 3**

Assignment Operators

2. **Variable Assignments:** Perform the following assignments in Python:
    - Assign the result of **10 + 5** to a variable **a**.
    - Assign **30** to a variable **b** and then update **b** by adding **5** using a compound assignment operator.

Arithmetic Assignment Operators

3. **Using Arithmetic Assignment Operators:** Given **x = 10**, perform the following operations using arithmetic assignment operators:
    - Add **5** to **x**.
    - Multiply **x** by **3**.
    - Subtract **2** from **x**.
    - Divide **x** by **4** and update **x** with the quotient.

Data Types

4. **Identify Data Types:** For each of the following values, identify the data type:
    - **42**
    - **3.14**
    - **True**
    - **"Hello, world!"**
    - Provide a code example that creates a variable of each type.

Type Casting

5. **Converting Data Types:** Write Python code that does the following:
    - Converts the string **"123"** to an integer and adds **10** to it.
    - Converts the number **50** to a string and concatenates it with **" apples"**.
    - Converts **3.9** to an integer.

Programming exercises

Guided Practice

1. **Quadratic Equation Solver:**
    - Input coefficients of a quadratic equation (a, b, c).
    - Calculate the solutions using the quadratic formula.
    - Output the solutions.
2. **Area of a Circle Calculator:**
    - Prompt for the radius of a circle.
    - Calculate the area using the formula πr^2.
    - Display the area with an explanatory message.
3. **Salary Increase Calculator:**
    - Input the current salary and the increase percentage.
    - Calculate the new salary after the increase.
    - Output the new salary amount.
4. **Volume of a Cylinder:**
    - Ask for the radius and height of a cylinder.
    - Calculate the volume using the formula πr^2h.
    - Show the calculated volume.

Unguided Practice [TO BE COMPLETED AT HOME AND SUBMITTED TO BB]

5. **Cuboid Area, Perimeter, and Volume Calculator:**
    - Input the length, width, and height of a cuboid.
    - Calculate the surface area, perimeter of the base, and volume.
    - Output these measurements with descriptive messages.
6. **Grade Calculator:**
    - Prompt for marks in 5 subjects.
    - Calculate the average mark.
    - Determine and display the grade based on the average.
7. **Savings Goal Tracker:**
    - Input the target savings goal and the current savings amount.
    - Ask for the monthly saving amount.
    - Calculate and display how many months it will take to reach the goal.
8. **Distance Between Two Points:**
    - Input coordinates of two points (x1, y1) and (x2, y2).
    - Use the distance formula to calculate the distance.
    - Display the distance between the points.

Quiz Questions

1. What is the output of **7 ** 2 / 2**?
    - A) 24.5
    - B) 49
    - C) 24
    - D) 12.5

2. What does **x = 5; x += 3; print(x)** output?
    - A) 5
    - B) 8
    - C) 3
    - D) 15

3. Evaluate **15 // 4 + 15 % 4**.
    - A) 18
    - B) 3
    - C) 7
    - D) 15

4. What is the result of **int('100', 2)**?
    - A) 4
    - B) 100
    - C) 2
    - D) Error

5. Calculate **8 * 3 + 2 ** 2 / 2**.
    - A) 25
    - B) 24.5
    - C) 26
    - D) 24

6. What does **y = 10; y *= 2; print(y)** display?
    - A) 20
    - B) 10
    - C) 5
    - D) 15

7. Determine the output of **float("123.456")**.
    - A) 123.456
    - B) "123.456"
    - C) 123
    - D) Error

8. What is the outcome of **bool(0)**?
    - A) True
    - B) False
    - C) 0
    - D) 1

9. Calculate **9 % 6 % 2**.
    - A) 1
    - B) 0
    - C) 2
    - D) 3
    -
10. What does **z = 4; z **= 2; print(z)** output?
    - A) 8
    - B) 16
    - C) 4
    - D) 2
    -
11. Evaluate **str(2+3) + "7"**.
    - A) "57"
    - B) "237"
    - C) "27"
    - D) "5"
    -
12. What is the result of **3 * (2 ** 3)**?
    - A) 24
    - B) 12
    - C) 9
    - D) 8
    -
13. Determine the output of **type(3.14)**.
    - A) **<class 'int'>**
    - B) **<class 'float'>**
    - C) **<class 'string'>**
    - D) **<class 'bool'>**
    -
14. What does **print(int(8.7))** display?
    - A) 8.7
    - B) 9
    - C) 8
    - D) 7
    -
15. Calculate **len("Hello" * 2)**.
    - A) 5
    - B) 10
    - C) 20
    - D) Error
    -
16. What is the outcome of **print("Python"[1])**?
    - A) P
    - B) y
    - C) t
    - D) h
    -
17. Evaluate **4 + 3 % 5**.
    - A) 2

- B) 7
- C) 5
- D) 0
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18. What does **a = 10; a /= 2; print(a)** result in?
    - A) 5.0
    - B) 5
    - C) 10
    - D) None of the above
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19. Determine the output of **round(5.76543, 2)**.

    - A) 5.76
    - B) 5.77
    - C) 5.8
    - D) 6

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20. What does **print(10 // 3)** display?
    - A) 3.33
    - B) 3
    - C) 4
    - D) 3.3
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21. Evaluate **2 ** 3 ** 2**.
    - A) 64
    - B) 512
    - C) 256
    - D) 729
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22. What is the result of **int("100" * 2) / 10**?
    - A) 1000
    - B) 10000
    - C) 100.0
    - D) 1000.0
    -
23. Calculate the expression **('a' * 2 + 'b' * 3)**.
    - A) "aabbb"
    - B) "aaabb"
    - C) "abababb"
    - D) "abba"
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24. What does **x = 5; x **= 3; print(x)** output?
    - A) 15
    - B) 125
    - C) 25
    - D) 30
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25. Determine the output of **float(int(5.4) + int('10'))**.
    - A) 15.0
    - B) 15
    - C) 5.4
    - D) 10

26. What is the outcome of **bool("False")**?
    - A) True
    - B) False
    - C) 0
    - D) 1
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27. Evaluate the expression **10 % 3 % 2**.
    - A) 1
    - B) 0
    - C) 2
    - D) 3
    -

28. What does **z = 16; z //= 2; print(z)** display?
    - A) 8
    - B) 16
    - C) 4
    - D) 2
    -

29. Calculate **len(str(int('5') * int('2')))**.
    - A) 1
    - B) 2
    - C) 3
    - D) 10
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30. What is the result of **3 ** 2 + 4 * 5 / 2**?
    - A) 17.0
    - B) 20.5
    - C) 19.0
    - D) 21.0