

SECTION B: VARIABLES AND ASSIGNMENTS

1. What do you understand by the **lifetime** of an object?
2. Write a code **snippet** to show the occurrence of **dynamic initialisation**.
3. Create a class called **BoxArea** which saves two double variables **l** and **b** to 4.5 and 7.4 respectively. Calculate and display the area of the box. Mark by using comments the **start** and **end** of a **scope**.
4. Create a class called **Average** and assign any value to three variables **num1**, **num2** and **num3**. Then calculate and display their average.
5. Create a class called **DigitQuotient** which holds the number 7256 in a variable **n** and then uses the quotient and remainder operators to extract and print each digit of **n**. The output should look like this:

The digits of n are 7, 2, 5 and 6

6. Create a class **Digits** that asks the user to input a number between 0 and 1000. The program then adds up all the digits in the integer and displays them.
7. Create a class called **Square** and assign the value 4 to the variable **length**. The program then finds the area and perimeter of the square.
8. Create a class called **Wage**. Create variables for name, hours, pay rate, overtime hours and overtime rate and assign them to Alex, 40.5, 6.50, 5.3 and 10.50 respectively. Then calculate and display the gross wage for Alex.
9. Create a class called **Arithmetic**. Assign a whole number to two variables **a** and **b** and then add them together. Then create a new variable called **total** and initialise it to 80. Use a compound assignment operator to hold in total the sum of all these variables and display the final value of total.
10. Create a class called **Density** which asks the user to input the mass and volume of an object and saves them in variables. Calculate and display the density of the object.
11. Create a class **Temperature** that receives a Fahrenheit temperature as input and outputs the equivalent in Celsius.
12. Create a class **Circle** which asks the user to input the radius of a circle. The program then calculates the perimeter and area of the circle. Assume that the value of PI is fixed at 3.142.
13. Create a class **Time** that asks the user to input any number of minutes. The program shows the equivalent in years and days.

14. Modify the class **Wage** so that it now calculates the net wage for Alex. The tax rate is fixed at 10.5%.
15. Create a class **BMI** which asks the user to input a weight and height. The BMI is then calculated and displayed.
16. Create a class **Numbers** which saves the numbers 25 and 29.9 in two different variables. The program should convert 25 to a double number and 29.9 to an integer number. Use two types of casting in your solution.
17. Create a class **secretMessage** which should display what the following ASCII message means:

74 97 118 97 32 119 97 115 32 111 114 105 103 105 110 97 108 108 121 32 99 97 108 108
101 100 32 79 97 107 32 97 110 100 32 119 97 115 32 109 97 100 101 32 98 121 32 97 99 99
105 100 101 110 116 33
18. Create a class **Age** which asks the user to input his current age. The program will then display a message showing the user how old he was last year. Use a unary operator in your solution.
19. Create a class **Velocity** which asks the user to input a distance in meters and time in seconds. The program should then calculate and display the velocity up to 3 decimal places.