

## ICT 1011 Computer Programming Lab Practical 06

## Functions (Methods in java)

1. Print the pattern given in Figure below by using functions.
  - a. Identify the repeating patterns and use functions to reduce the repetitions.

2. Write a function “max” which accepts two integer parameters and returns another integer.
  - The function should find the maximum value of the two integers passed to the parameters and then return the result.
  - Test your function using a driver program
3. Write a function which returns the absolute value of the given integer parameter.

- Test your function using a driver program
- Write a function to do arithmetic division.
    - The function accepts two integer parameters as the numerator and denominator.
    - The function should divide the numerator by the denominator and return the answer.
    - The function should check whether the denominator is zero before the division and if it is zero, the it should return 2147483647 (the maximum of the int).
    - Test your function using a driver program.
  - Write a function to return the square of two given float parameters.
    - Test your function using a driver program.
  - Write a function which converts degrees to radians.
    - Conversion:  $\text{radians} = \text{degrees} * \text{PI} / 180$
    - Test your function using a driver program.
  - Write a function to calculate the sum of all integers from zero to the given integer through the parameter.
    - Ex: `sumAll(10)` → 55
    - Test your function using a driver program.
  - Write a function to measure the length of the arc from a circle.

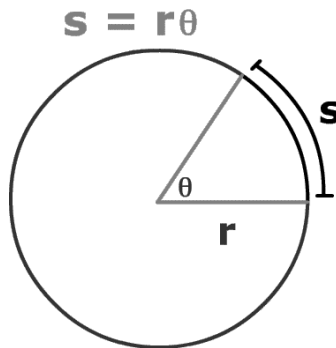


Figure 3 Measuring Arc ( $\theta$  is in radians)

- Your driver program should ask for the radius and the angle  $\theta$  in degrees.
  - Write a function which accepts the angle in degrees and the radius, and then output the length of the arc.
  - Use the function you wrote for the question 8 to convert the angle to radians.
- Write a program to calculate the Body Mass Index (BMI) using functions.
    - Your driver program should first ask from the user to a unit system from “metric” and “imperial”.
    - Write functions to convert imperial units (pounds-lb and ounces-oz, foot and inch) to metric units (Kilograms and meters).

Imperial	Metric
1 lb	0.453592 Kg
1 oz	0.0283495 Kg
1 Foot	0.3048 m
1 inch	0.0254 m

- Write a function to calculate BMI for metric units.
  - i. Calculation:  $BMI = \text{weightInKilograms} / (\text{heightInMeters})^2$
- Use conditional statement to convert the imperial units to metric if the user prefers inserting values in imperial units.

#### 10. Custom Calculator

Write a menu-driven calculator using only functions for:

- Addition, subtraction, multiplication, division
- Exponentiation using a loop
- Integer factorial

Each operation must be implemented in its own function.