Numerical methods in Biomedical Engineering

Tutorial I

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1 Conditional Loop Statements

1.1 *if...else*

Result: Number entered is even or Odd.

Initialise the Input;

if *The remainder is equal to 0 after dividing by 2* **then**

    Print that the number is Even;

else

    Print that the number is Odd;

end

Algorithm 1: Check if a number is Even or Odd

1.2 *Nested if...else*

Result: Good Morning or Good Afternoon or Good Evening.

Initialise the Input x **as time**;

if x is between 0.00 hrs and 23.59 hrs **then**

if x is between 0.00 hrs and 12.00 hrs **then**

Print Good Morning.

else if x is between 12.00 hrs and 16.00 hrs **then**

Print Good Afternoon.

else

Print Good Evening.

end if

else

Print the time entered is invalid.

end if

Algorithm 2: Greetings according to time

1.3 *Switch Case*

Result: The required amount.

Initialise the Input $\boldsymbol{x}$ as option;

Print the list of options:

1. Item 1.
2. Item 2.
3. Item 3.

switch (x)

case 1**:**

Print:The amount is Rs. 100.

case 2**:**

Print: The amount is Rs. 200.

case 3**:**

Print: The amount is Rs. 300.

default:

Print: Invalid option entered.

end switch

Algorithm 3: Value of items.

2 Loop Statements

2.1 *For Loop*

Function$\{f = fact(x)\}$;
Initialise:
$f \leftarrow 1$
$i \leftarrow 1$
for $i = 1$ to f **do**
  $f \leftarrow f * i$
end for
return Factorial of the number f.
EndFunction

Algorithm 4: Calculate the factorial of a number using a function.

2.2 *While loop*

Ensure: $x \leftarrow RandomInteger$
  $i \Leftarrow Count = 0$
  while $x \leq SomeMaximumValue$ **do**
    $i \leftarrow i + 1$
    $x \leftarrow RandomInteger$
  end while
  Print the count i.

Algorithm 5: Counting the numbers less than a maximum.