

DATE: / /

Name:

Danijal Saeed

Sap id:

53937

Section:

BS Data Science

Course:

Analysis of Algorithm

Assignment 1

Question 1:

Algorithm Drive - School To Home()

Input start (RIU 1-14/3)

destination = "Gisja Road."

Step 1

move forward (650m)

current location \leftarrow "Sector 1-14/3"

Step 2

move forward (800m) via Road B

current location \leftarrow "Bata Chowk"

Step 3

Move forward (8.1 km) via
main Gisja Road

current location \leftarrow "Gisja Road"

DATE: ___ / ___ / ___

Step 4

current location \leftarrow destination

Output

("Arrived at Home")

Stop

End algorithm

Facts of Algorithm

Variable:

Start: initial location (RIU)

Destination: final location
(Home)

Current location: keeps track of progress

Distance: values like 650m, 800m, 8.1km

Input Statement

Read (Start, destination)

Calculations

$$\begin{aligned} \text{Total distance} &= 650\text{m} + 800\text{m} + 8.1\text{km} \\ &= 9.55\text{ km} \end{aligned}$$

DATE: _____

Assignments:

Current location \leftarrow start

Current location \leftarrow sector 1-14/3

Current location \leftarrow "Road Beta chut"

Current location \leftarrow "Giga Read my Name"

Current location \leftarrow "destination"

Question 2 :

Algorithm Square Root - linear search (n)

Input n (positive Integer)

Output: Integer part of \sqrt{n}

Step 1 // initialization

$i \leftarrow 1$

Step 2 // loop until square exceeds

while ($i^2 \leq n$) do

$i \leftarrow i + 1$

End while

Step 3 // correct overshoot

$i \leftarrow i - 1$

Step 4 // output Result

Output ("Square root of ", $n = < ; i$)

end algorithm

Facts of algorithm

Variables:

$n \rightarrow$ input number

$i \rightarrow$ counter variable

Input Statement:
Read (n)

Calculation:

Repeatedly check $(i+i) \leq n$

Stop when $(i+i) > n$.

answer = $i-1$

Output Statement:

"Square Root of $n = i"$

Assignment:

$i \leftarrow 1$

$i \leftarrow i+1$ (inside loop)

$i \leftarrow i-1$ (final correction)

DATE: _____

Name :

Daniyal Saeed
Sap id: 53937

Assignment 1

Question 3

Algorithm find common elements
(A, B, m, n).

i ← 0 , j ← 0

while i < m and j < n

if A[i] = B[j] Then

output A[i]

i ← i + 1

j ← j + 1

Else if A[i] < B[j] then

i ← i + 1

else

End while

End algorithm

DATE: _____

Facts of Algorithm

Variable:

A, B, i, j, m, n

Input statement:

Read (A, B, m, n)

Calculation:

Compare element and more P.

Output statement:

Print common elements

Assignment:

i \leftarrow i + 1

j \leftarrow j + 1

Maximum Comparison:

At most $m+n-1$ comparison
in worst case.

GitHub Link