

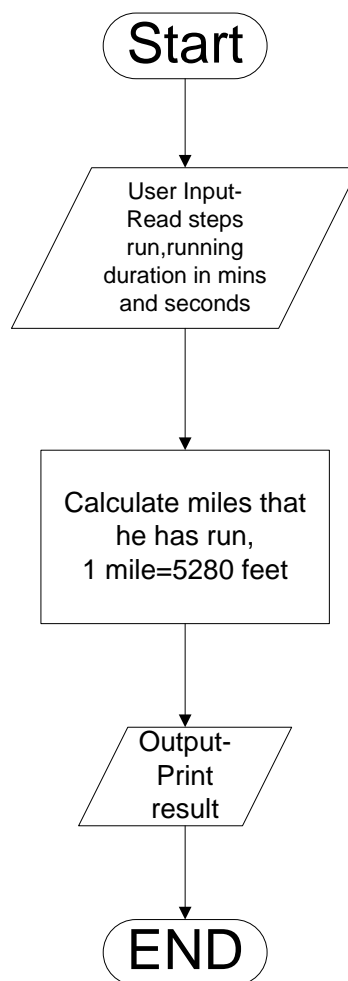
2.4 Exercises

For each of the following problems, identify the problem inputs, processes, and problem outputs. Then write pseudocode and create flowchart for each solution.

1. Let a runner insert how many steps he has run in one minute, and the running duration in minutes and seconds. Find how many miles he has run. Assume each of his step length is 2.5 feet. (1 mile = 5280 feet)

Pseudocode

- 1.0 Start
- 2.0 User input data
 - 2.1 Read how many steps run in 1 minute
 - 2.2 Read the running duration in minutes and seconds
- 3.0 Calculate the miles run
 - 3.1 Miles = Steps*2.5/5280*(m + s/60)
- 4.0 Print output in miles.
- 5.0 End



2. This is a program to calculate and display the body mass index (BMI). The BMI is to determine whether a person is overweight, underweight or has an optimal weight for his/her weight. A person's BMI is calculated using the formula $BMI = \text{weight}/\text{height}^2$. A sedentary person's weight is considered to be optimal if his/her BMI is between 18.5 and 25. If the BMI is less than 18.5, the person is considered to be underweight. If the BMI value is greater than 25, the person is considered to be overweight. To determine the BMI, let the organiser enter the total number of people participating in this program. Then let each participant enter his/her weight (in kg) and height (in meters); and as a result, the participant gets a message indicating whether he/she has optimal weight, is underweight, or is overweight. Repeat the process for all participants.

Pseudocode

```
1.0 Start
2.0 Read total number of people,n
3.0 User input data
    3.1 Enter weight (in kg)
    3.2 Enter height (in meters)
4.0 Calculate BMI
    4.1  $BMI = w/h^2$ 
    4.2 If  $BMI < 18.5$ 
        Print Underweight

        If  $BMI > 25$ 
            Print Overweight

        Else
            Print optimal weight
5.0 Print output
6.0 Repeat the process from 3.0 if  $n > 0$ 
7.0 End
```

