LAB 2: DESIGNING PSEUDOCODE AND FLOWCHART USING MICROSOFT WORD

OBJECTIVES FOR STUDENTS

1. Develop pseudocode using Microsoft Word software.
   [*Membina kod sudo menggunakan perisian Microsoft Word.*]

2. Develop flowchart using Microsoft Word software.
   [*Membina carta alir menggunakan perisian Microsoft Word.*]

3. Trace pseudocode and flowchart in order to determine the contents of the variables and the output.
   [*Menjejak kod sudo dan carta alir untuk menentukan kandungan pemboleh ubah dan output algoritma.*]

4. Design a pseudocode or a flowchart with given problem.
   [*Mereka bentuk kod sudo dan carta alir bagi masalah yang diberikan.*]

ASSUMPTIONS

5. Students have the basic experience in starting (booting) the computer.
   [*Pelajar mempunyai pengalaman asas memulakan (but) komputer.*]

6. Students have the basic experience in loading and opening particular software in Microsoft Windows.
   [*Pelajar mempunyai pengalaman asas memuat dan membuka perisian tertentu dalam Microsoft Windows.*]

LAB EXERCISES

EXERCISE 1: DEVELOP THE PSEUDOCODE USING MICROSOFT WORD

[*LATIHAN 1: MEMBINA KOD SUDO MENGGUNAKAN MICROSOFT WORD*]

7. Loading the Microsoft Word software.
   [*Memuatkan perisian Microsoft Word*.]

   i. Load the Microsoft Word software into the main memory of the computer (i.e. RAM).
   [*Muatkan perisian Microsoft Word ke dalam ingatan utama komputer, iaitu RAM.*]

   ii. To load the Microsoft Word software:

[*Uuntuk memuatkan perisian Microsoft Word*:]

a. Click on the **Start** menu at the bottom-left of the screen.
[*Klik pada menu* **Start** *yang berada di bahagian bawah sebelah kiri skrin.*]

b. Choose **Microsoft Word** represented by the icon

[*Pilih* **Microsoft Word** *yang diwakili oleh ikon*]

The Microsoft Word software is displayed as in Figure 2.1 below:
[*Perisian Microsoft Word dipamerkan seperti dalam Rajah 2.1 berikut*:]

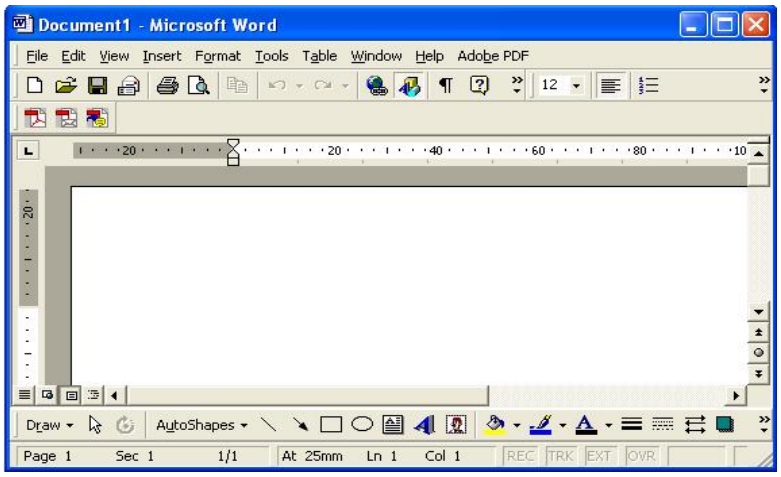

Figure 2.1

8. Type the following pseudocode.
[*Taipkan kod sudo berikut*.]

```
Algorithm 2.1 : To calculate the total of three numbers
   1.  Start
   2.  Set TOTAL to 0
   3.  Read NUMBER1
   4.  Read NUMBER2
   5.  Read NUMBER3
   6.  Add NUMBER1, NUMBER2 dan NUMBER3 and store in TOTAL
   7.  Display TOTAL
   8.  End
```

OR
[*Atau*]

```
Algoritma 2.2 : Mengira hasil tambah bagi tiga nombor
   1.  Mula
   2.  Setkan HASILTAMBAH bersamaan 0
   3.  Baca NOMBOR1
   4.  Baca NOMBOR2
   5.  Baca NOMBOR3
   6.  Tambah NOMBOR1, NOMBOR2 dan NOMBOR3 dan simpan dlm
       HASILTAMBAH
   7.  Paparkan HASILTAMBAH
   8.  Tamat
```

9. Save the pseudocode file.
[*Simpan fail kod sudo*.]

iii. To save a word document:
[*Untuk menyimpan dokumen word*:]

a. Click on the **File** menu. Select **Save As** as shown in Figure 2.2.
[*Klik pada menu* **File**. *Pilih pilihan* **Save As** *seperti Rajah 2.2*.]

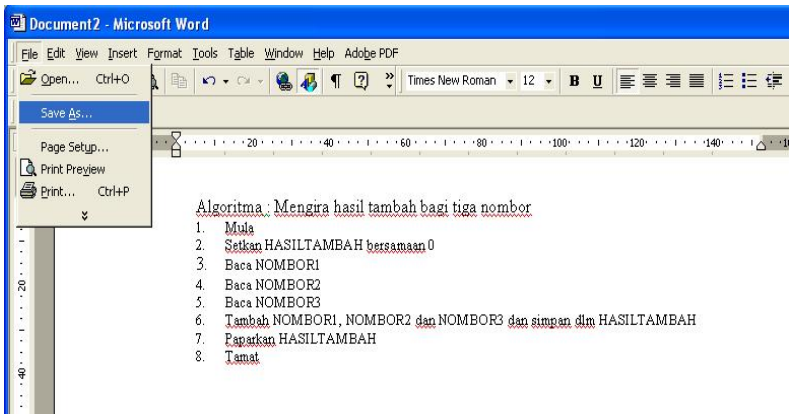

Figure 2.2

b. Click twice on the folder that contains your files. Then type your word document filename. For example, **KodSudoKira3Nom** as in Figure 2.3 below:
[*Klik dua kali pada folder yang mengandungi fail-fail anda. Kemudian taipkan nama fail dokumen word. Sebagai contoh,* **KodSudoKira3Nom** *seperti Rajah 2.3 berikut*:]

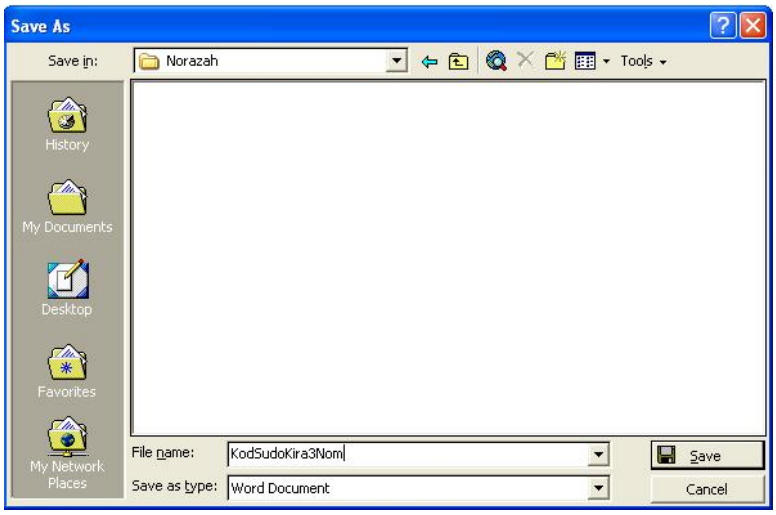

Figure 2.3

c. Click on the **Save** button
[*Klik bebutang Save*]

EXERCISE 2: DEVELOP THE FLOWCHART USING MICROSOFT WINDOWS

[*LATIHAN 2: MEMBINA CARTA ALIR MENGGUNAKAN MICROSOFT WINDOWS*]

1. Move cursor to new page.
[*Gerak kursor ke halaman baru.*]

i. Apply the **Page Break** function:
[*Pilih fungsi* **Page Break**.]

a. On the **Insert** menu, select **Break** as shown in Figure 2.4.
[*Pada menu* **Insert**, *pilih pilihan* **Break** *seperti yang ditunjukkan dalam Rajah 2.4.*]

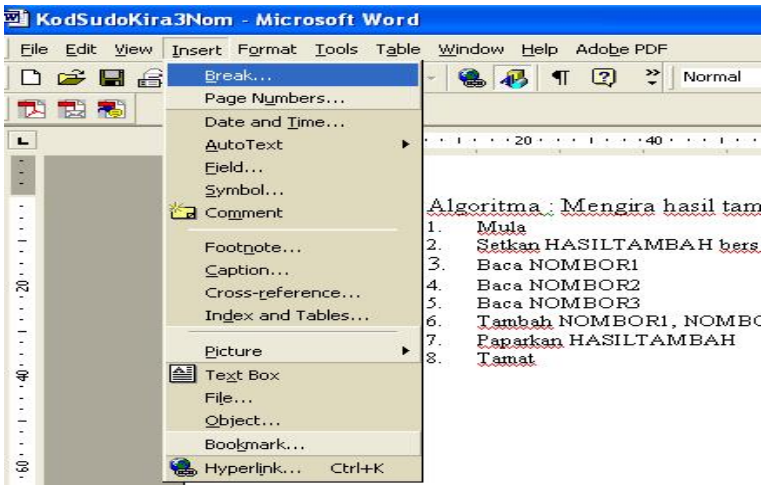

Figure 2.4

b. On the following dialogue box, select **Page Break** and click on the **OK** button. See Figure 2.5.
[*Pada kekotak dialog berikut, pilih pada* **Page Break** *dan klik pada bebutang* **OK**. *Lihat Rajah 2.5.*]

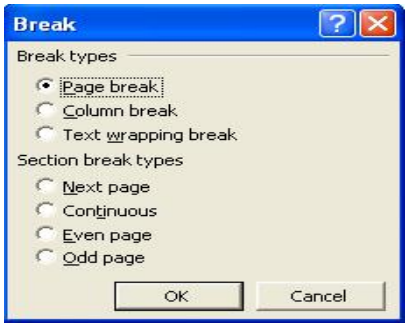

Figure 2.5

2. Activate the **Drawing** submenu.
[*Aktifkan submenu* **Drawing**.]

3. Make sure that the **Drawing** submenu is activated. If it is not active, on the **View** menu, select **Toolbars** and select **Drawing** as Figure 2.6 below:
[*Pastikan bahagian* **Drawing** *diaktifkan. Jika tidak aktif, pada menu* **View**, *pilih* **Toolbars** *dan pilih* **Drawing** *seperti Rajah 2.6 berikut*:]

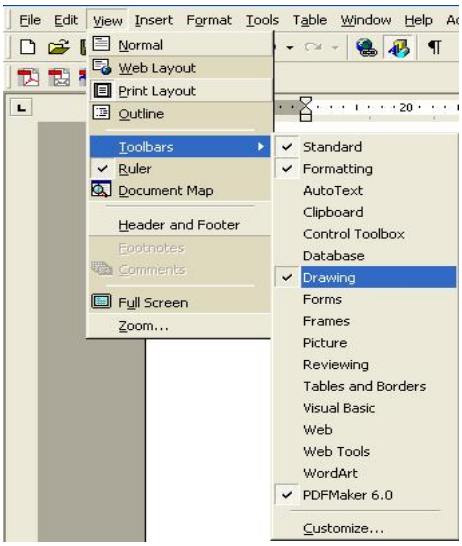

Figure 2.6

If active, the **Drawing** submenu is normally found as a panel located at the bottom of the screen.
[*Sekiranya aktif, submenu* **Drawing** *lazimnya terdapat sebagai panel di bahagian bawah skrin.*]

4. On the **Drawing** panel, click on the text box icon. See Figure 2.7.
[*Pada panel* **Drawing**, *klik pada ikon kekotak teks. Lihat Rajah 2.7.*]

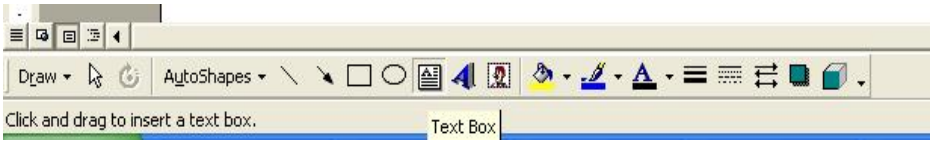

Figure 2.7

5. Draw a rectangular shape and label it with **Start** as below:
[*Lukis satu kawasan segi empat dan labelkannya sebagai* **Start** *seperti contoh berikut*:]

Start

6. Change its shape to a terminal symbol by clicking on the **Draw** menu, select **Change Autoshape**, select **Flowchart**, select the **terminator** symbol. See Figure 2.8.
[*Ubah rupa supaya berbentuk simbol terminal dengan cara, klik pada menu* **Draw**, *pilih* **Change Autoshape**, *pilih* **Flowchart**, *pilih simbol* **terminator**. *Lihat Rajah 2.8*.]

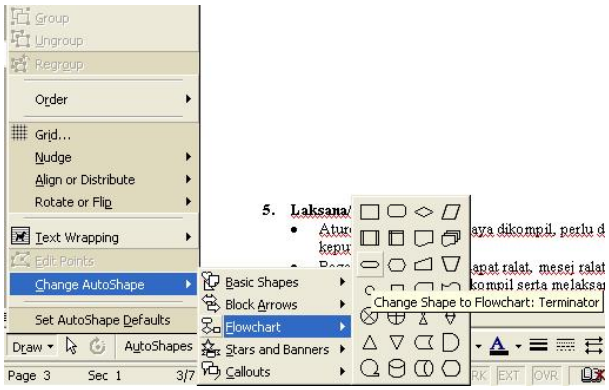

Figure 2.8

7. Draw the flowchart as in Figure 2.9:
[*Bina carta alir seperti Rajah 2.9*:]

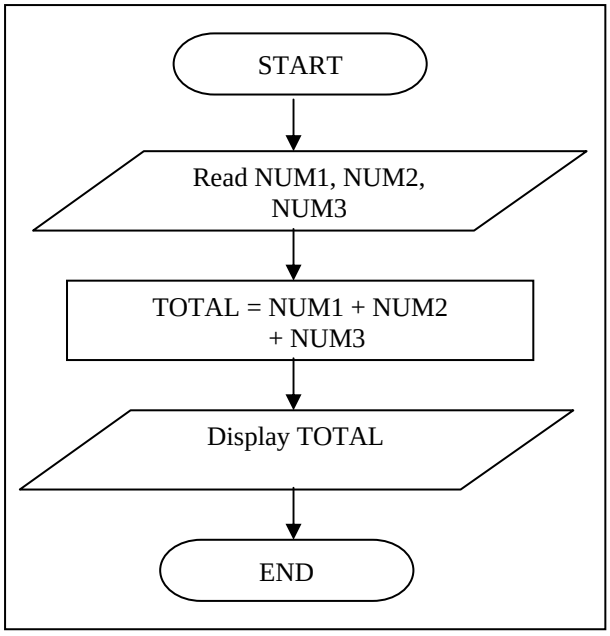

Figure 2.9

This flowchart is a conversion from the pseudocode done in Exercise 1.
[*Carta alir ini ditukar daripada kod sudo yang telah di bina dalam Latihan 1*.]

8. Save the file as **CartaAlirKira3Nom**.
[*Simpan fail sebagai* **CartaAlirKira3Nom**.]

EXERCISE 3:
[*LATIHAN 3*]

1. Using the Microsoft Word software, develop the pseudocode as in Algorithm 2.3 that converts the distance in mile to kilometer. Then trace the content of the variables and determine the output of Algorithm 2.3.
[*Dengan menggunakan perisian Microsoft Word, bina kod sudo seperti Algoritma 2.3 yang menukarkan jarak dalam unit batu kepada kilometer. Kemudian jejak kandungan pembolehubah dan tentukan output Algoritma 2.3 tersebut*.]

```
Algorithm 2.3: Convert the distance in mile to kilometer
   1.  Start
   2.  Set KM_PER_MILE to 1.609
   3.  Set Distance_Mile to 100
   4.  Convert the distance in mile to kilometers using the
       formula:
           Distance_Kilo = KM_PER_MILE x Distance_Mile
   5.  Display the distance in kilometer
   6.  End
```

2. Using the Microsoft Word software, develop a pseudocode that assigns values to variables as in Algorithm 2.4. Then trace the content of the variables and determine the output of the Algorithm 2.4.
[*Dengan menggunakan perisian Microsoft Word, bina kod sudo yang mengumpukkan nilai kepada pembolehubah seperti Algoritma 2.4. Kemudian jejak kandungan pembolehubah dan tentukan output bagi Algoritma 2.4 tersebut*.]

```
Algorithm 2.4: Determine the content of variables
   1.  Start
   2.  Set Data1 = 5
   3.  Set Data2 = 2.5
   4.  Data3 = Data1 + Data2
   5.  Data2 = Data3 x Data1
   6.  Display Data1, Data2, Data3
   7.  End
```

3. Using the Microsoft Word software, develop a pseudocode that reads the radius of a circle, and computes the area of the circle as in Algorithm 2.5.
[*Dengan menggunakan perisian Microsoft Word, bina kod sudo seperti Algoritma 2.5 yang membaca jejari bagi suatu bulatan dan mengira luas kawasan bulatan tersebut*.]

```
Algorithm 2.5: Compute the area of a circle
    1.  Start
    2.  Set PI = 3.14159
    3.  Read the Radius
    4.  Calculate the area of a circle using the formula:
        Area = Radius x Radius x PI
    5.  Display Area
    6.  End
```

   i. Trace the content of the variables and determine the output of the Algorithm 2.5 if the input for Radius is:
   [*Jejak kandungan pembolehubah serta tentukan output Algoritma 2.5 sekiranya input jejari (Radius) ialah*:]

      a. 3
      b. 10
      c. 150

4. Using the Microsoft Word software, develop a pseudocode that reads the money collection of a user. The algorithm computes the number of Ringgit and cents (50, 20, 10 5, and 1 cent) that can be extracted from the collection. Tips: You can use the **Modulus** operator that obtains the remainder from a division.

[*Dengan menggunakan perisian Microsoft Word, bina kod sudo yang membaca koleksi duit pengguna. Algoritma tersebut mengira bilangan Ringgit dan syiling (50, 20, 10, 5, dan 1 sen) yang boleh diasing-asingkan daripada koleksi tersebut. Panduan: Anda boleh menggunakan operator* **Modulus** *untuk mendapatkan baki daripada hasil bahagi*.]

i. Trace the content of the variables and determine the output of Algorithm 2.6 if the input for the money collection is as follows:
[*Jejak kandungan pembolehubah serta tentukan output bagi Algoritma 2.6 sekiranya input koleksi adalah seperti berikut*:]

a. 927
b. 1274
c. 6785
d. 35565

```
Algorithm 2.6: Compute Money Change from Collection to
Ringgit and cents
  1.  Start
  2.  Read the Collection
  3.  Determine the total for ringgit using the formula:
         Ringgit = Collection / 100
  4.  Determine the remaining amount using the formula:
         Remain_Amt = Collection Modulus 100
  5.  Determine the total 50 cents in the remaining
      amount using the formula:
         Fifty_Cent = Remain_Amt / 50
  6.  Determine the remaining amount using the formula:
         Remain_Amt = Remain_Amt Modulus 50
  7.  Determine the total 20 cents in the remaining
      amount using the formula:
         Twenty_Cent = Remain_Amt / 20
  8.  Determine the remaining amount using the formula:
         Remain_Amt = Remain_Amt Modulus 20
  9.  Determine the total 10 cents in the remaining
      amount using the formula:
         Ten_Cent = Remain_Amt / 10
  10. Determine the remaining amount using the formula:
         Remain_Amt = Remain_Amt Modulus 10
  11. Determine the total 5 cents in the remaining
      amount using the formula:
         Five_Cent = Remain_Amt / 5
  12. Determine the remaining amount using the formula:
         Remain_Amt = Remain_Amt Modulus 5
  13. Determine the total 1 cents in the remaining
      amount using the formula:
         One_Cent = Remain_Amt
  14. Display Collection, Ringgit, Fifty_Cent,
         Twenty_Cent, Ten_Cent, Five_Cent, One_Cent
  15. End
```

EXERCISE 4:
[*LATIHAN 4*]

1. Using the Microsoft Word software, draw a flowchart as in Figure 2.10 that calculates the payment for normal and overtime working hours of an employee. Then trace the content of the variables and determine the output displayed from the algorithm.
[*Dengan menggunakan perisian Microsoft Word, lukiskan carta alir seperti Rajah 2.10 yang mengira bayaran untuk jam kerja normal dan lebih masa seseorang pekerja. Kemudian jejak kandungan pembolehubah dan tentukan output algoritma tersebut*.]

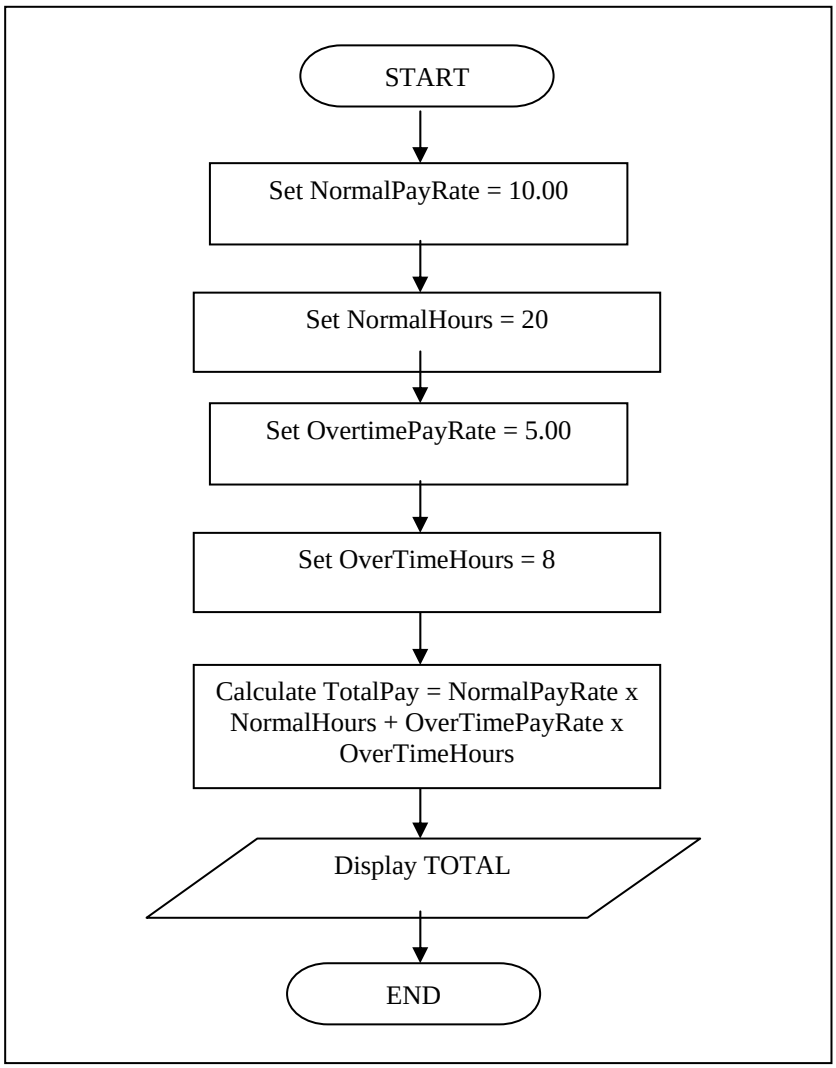

Figure 2.10

2. Using the Microsoft Word software, draw a flowchart as in Figure 2.11 that calculates the total cost of item purchased.
[*Dengan menggunakan perisian Microsoft Word, lukiskan carta alir seperti Rajah 2.11 yang mengira jumlah harga sesuatu pembelian*.]

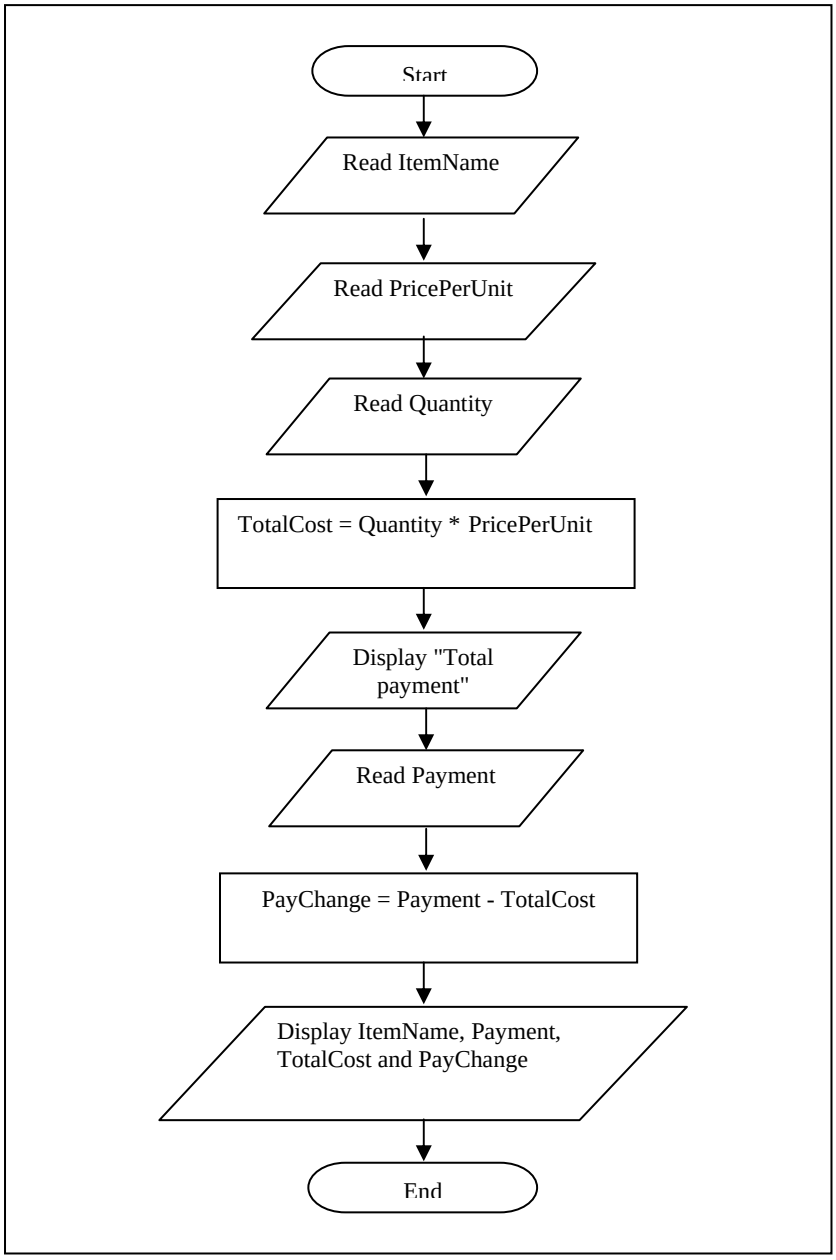

Figure 2.11

i. Trace the content of the variables and determine the output of the algorithm if the input values are as follows:
[*Jejak kandungan pembolehubah dan tentukan output algoritma tersebut sekiranya input adalah seperti berikut*:]

a. ItemName: **`Pencil`**
PricePerUnit: **`0.50`**
Quantity: **`15`**
Payment: **`10.00`**

b. ItemName: **`Note book`**
PricePerUnit: **`2.00`**
Quantity: **`5`**
Payment: **`50.00`**

c. ItemName: **`Pencil`**
PricePerUnit: **`3`**
Quantity: **`1`**
Payment: **`5.00`**

EXERCISE 5:
[*LATIHAN 5*]

Given the following set of problems. Analyze each problem and identify the input, formula and the output. Write the pseudocode and draw the flowchart for the problem. [*Diberi masalah-masalah seperti berikut. Analisis setiap masalah dan kenalpasti input, formula serta output. Tuliskan kod sudo dan lakarkan carta alir bagi masalah berkenaan.*]

1. Read three numbers. Calculate the sum of those three numbers and find the average. Display all the three numbers, as well as the total of those numbers and the in average.
[*Baca tiga nombor. Kira dan jumlahkan ketiga-tiga nombor dan cari purata. Paparkan ketiga-tiga nombor, dan juga jumlah ketiga-tiga nombor serta puratanya.*]

`Output:`

`Input:`

`Formula:`

`Pseudocode design of the problem:`

`Flowchart design of the problem:`

2. Calculate the average weight of four students. Attempt to analyze this problem by stating it's input, output and the formula required to determine the average weight. Display each student's weight and the average weight calculated.
[*Cari purata berat bagi 4 orang pelajar. Paparkan berat setiap pelajar dan purata yang dikira. Cuba analisa permasalahan ini dengan menyatakan input, output serta formula yang diperlukan untuk mengira purata.*]

Output:

Input:

Formula:

Pseudocode design of the problem:

Flowchart design of the problem:

3. Convert the time entered by the user in the form of day, hours and minute to minutes. The conversion unit is as follows:
   1 day is equivalent to 24 hours
   1 hour is equivalent to 60 minutes
[*Tukarkan masa yang dimasukkan oleh pengguna dalam bentuk hari, jam dan minit ke minit. Pertukaran unit adalah seperti berikut:*
   1 hari bersamaan dengan 24 jam
   1 jam bersamaan dengan 60 minit]

Output:

Input:

Formula:

Pseudocode design of the problem:

Flowchart design of the problem:

4. Convert the temperature entered by the user in the unit of Fahrenheit to the unit of Celcius. The conversion formula is as follows:

$$\text{Fahrenheit} = \left[\text{Celsius} \times \frac{9}{5}\right] + 32$$

[*Tukarkan suhu yang dimasukkan oleh pengguna ke dalam unit Fahrenheit kepada unit Celcius. Formula penukaran unit adalah seperti berikut*:]

Output:

Input:

Formula:

Pseudocode design of the problem:

Flowchart design of the problem:

EXERCISE 6:
[*LATIHAN 6*]

Given the following problem. Analyze the problem and design its solution using structured chart. Then write the appropriate pseudocode or flowchart.
[*Diberi masalah berikut. Analisa masalah tersebut dan reka bentuk penyelesaiannya menggunakan carta berstruktur. Kemudian, tuliskan kod sudo atau carta alir yang bersesuaian.*]

1. A student has designed an object as shown in Figure 2.12. You need to calculate both the perimeter and the area of the object, based on the length and the width of the rectangle entered by the user, as well as the height of the triangle.
[*Seorang pelajar telah mereka bentuk suatu objek seperti Rajah 2.12. Anda perlu mengira perimeter dan luas objek tersebut berdasarkan kepada nilai panjang dan lebar segiempat yang dimasukkan oleh pengguna, serta nilai tinggi segitiga objek tersebut.*]

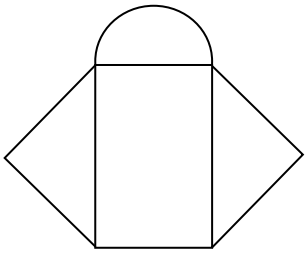

Figure 2.12