LAB 10: PREDEFINED FUNCTIONS

OBJECTIVES FOR STUDENTS

1. Use predefined functions.
   [*Menggunakan fungsi takrifan piawai*.]

2. Convert mathematical formula into C statement using predefined functions.
   [*Menukarkan formula matematik kepada bentuk pernyataan C menggunakan fungsi takrifan piawai*.]

ASSUMPTIONS

1. Students have knowledge on arithmetic calculation using C.
   [*Pelajar mempunyai pengetahuan di dalam pengiraan aritmetik menggunakan C*.]

LAB EXERCISES

EXERCISE 1:
[*LATIHAN 1*]

1. Describe the difference between predefined function and programmer-defined function?
   [*Jelaskan perbezaan di antara fungsi takrifan piawai dan fungsi takrifan pengguna?*]

2. Write statement in C to calculate equation bellow using function from math library.
   [*Tulis dalam pernyataan C bagi setiap persamaan matematik berikut dengan menggunakan fungsi daripada pustaka math*.]

   i. $(x)^{\frac{1}{2}}$
   ii. $\cos(x)$
   iii. $\sin(x)$
   iv. $(x)^{7}$
   v. $\dfrac{(x^3 + x^7)}{x}$
   vi. $\sqrt{|a-b|}$

EXERCISE 2:
[*LATIHAN 2*]

1. What is the output of the following C statements? What is the difference between the result in line 5 and 6?
[*Apakah output bagi pernyataan C berikut*? *Apakah perbezaan keputusan pada baris 5 dan 6*?]

```
1   double x = 781.2856789;
2   printf ("%.5lf\n", x);
3   x =(floor(x * 100 + 0.5)/100);
4   printf ("%.5lf\n", x);
5   x = (int(x * 100 + 0.5)/100);
6   printf ("%.5lf\n", x);
```

2. Complete Program 10.1 below. Trace the output of each math functions and brief what it does.
[*Lengkapkap Program 10.1 di bawah. Tentukan output dan huraikan peranan bagi setiap fungsi math yang digunakan*.]

```
1   //Program 10.1
2   #include <stdio.h>
3   #include <conio.h>
4   // 1. Write down an appropriate directive here
5
6   int main()
7   {
8      int a = sqrt(9);
9      printf("\n 1. sqrt(9) is %d ", a);
10
11     int i = pow(5,3);
12     printf("\n 2. pow(5,3) is %d ", i);
13
14     int j = ceil(2.5);
15     printf("\n 3. ceil(2.5) is %d ", j);
16
17     int k = floor(2.5);
18     printf("\n 4. floor(2.5) is %d ", k);
19
20     int x = ceil(2.1);
21     printf("\n 5. ceil(2.1) is %d ", x);
22
23     int y = floor(2.1);
24     printf("\n 6. floor(2.1) is %d ", y);
25     getch();
26     return 0;
27  }
```

EXERCISE 3:
[*LATIHAN 3*]

1. Program 10.2 uses several predefined functions from stdlib library. Determine what the program tries to show.
[*Program 10.2 menggunakan beberapa fungsi yang terdapat di dalam pustaka stdlib. Tentukan paparan Program 10.2 tersebut.*]

```
1   //Program 10.2
2   #include <stdio.h>
3   #include <conio.h>
4   #include <stdlib.h>
5
6   int main()
7   {
8      int a,b,c,d;
9      printf ("Enter the starting number\n");
10     scanf ("%d", &a);
11     srand(a);
12     b=rand()%RAND_MAX;
13     c=rand()%200;
14     d=rand()%10+200;
15     printf ("The number between 0 and %d is : %d\n",
       RAND_MAX, b);
16     printf   ("The   number   between   0   and   199
       is : %d\n", c);
17     printf   ("The   number   between   200   and   210
       is : %d\n", d);
18     getch();
19     return 0;
20  }
```

EXERCISE 4:
[*LATIHAN 4*]

1. Write a program that find the round value of the following number:
[*Tulis aturcara bagi mendapatkan nilai bulat seperti nombor berikut:*]

   i. To the nearest tenth.
   [*Kepada sepuluh terhampir.*]

   ii. To the nearest 1/tenth.
   [*Kepada 1/sepuluh terhampir.*]

   iii. To the nearest 1/hundredth.
   [*Kepada 1/seratus terhampir.*]