Answer ALL the questions: (Topic: Complex Selection, Sentinel controlled repetition & Infinite loop)

1. Write a C program that determine the digit places in a number as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| Positive number | Even Number | >=10 | The place value of digit is TENs |
| >=100 | The place value of digit is HUNDREDs |
| >=1000 | The place value of digit is THOUSANDs |
| >=10000 | The place value of digit is TENs of THOUSANDs |

🡪 If NOT in “Positive Number” and “Even Number”, please give an ERROR message.

1. You are searching for a subject in a PASUM and you’re asked to select a subject from a choice of two foundation programs namely:

* Foundation in Life Sciences
* Foundation in Physical Sciences

Having selected a program, you are again provided with a list of departments that fall under the department namely:

* Department of Mathematic
* Department of Science

Department of Mathematic provide a list of subject as follows:

|  |  |  |
| --- | --- | --- |
| Physical Sciences | Mathematic | Mathematic 1 |
| Mathematic 2 |
| Mathematic 3 |
| Computer Science | Programming 1 |
| Programming 2 |
| Life Sciences | Mathematic | Mathematic 1 |
| Mathematic 2 |

Department of Science provide a list of subject as follows:

|  |  |  |
| --- | --- | --- |
| Physical Sciences | Physics | Physics 1 |
| Physics 2 |
| Chemistry | Chemistry 1 |
| Chemistry 2 |
| Life Sciences | Physics | Physics 1 |
| Physics 2 |
| Chemistry | Chemistry 1 |
| Chemistry 2 |
| Biology | Biology 1 |
| Biology 2 |

Write a C program to solve the problem above. Please use Nested Switch statement.

L: Foundation in Life Sciences

P: Foundation in Physical Sciences

Make your selection --> P

Available Departments

1.Department of Mathematic

2.Department of Science

Make your selection --> 1

Available Units

1.Mathematic

2.Computer Science

Make your selection --> 2

Available Subjects

1.Programming 1

2.Programming 2

Make your selection --> 2

You choose Subject Programming 2

Sample output:

1. The following C code calculates the summation of each integer which enters by the user.

#include<stdio.h>

int main()

{

int value, sum = 0;

printf("Enter an integer, 0 to quit: ");

scanf("%d",&value);

while(value!=0){

sum=sum+value;

printf("Enter an integer, 0 to quit: ");

scanf("%d",&value);

}

printf("Sum of the integers is %d\n",sum);

return 0;

}

1. Is there any limit to how many times the loop body could execute?
2. What would happen if the very first integer the user entered were 0?
3. The value 0 in this program is the sentinel value. Could any other value be used?
4. Refer to the following code.

1 #include <stdio.h>

2 int main()

3 {

4 int count = 0;

5

6 while(1)

7 {

8 printf("%d, ",count);

9 count = count+1;

10 }

11 printf("\n");

13

14 return(0);

15 }

1. Type the source code above. Save, build and run. Observed the output.
2. What is the meaning of infinite loop?
3. What causes an infinite loop?
4. Modify the source code above by adding the following if and break statements after line 9 and before the curly bracket in line 10. Save, build and run. Observed the output.

if(count>50)  
 break;

1. Rewrite the modified code in 2(d), so that an endless for loop is used instead of an endless while loop.
2. Write a sentinel controlled while loop that accumulates a series of test scores input by the user, until -99 is entered. The code should then report how many scores were entered and the average of these scores. Do not count the end sentinel -99 as a score.
3. A water filter company pays its salesman on a commission basis. The salesmen receive RM200 per week plus 9% of their gross sales for that week. For example, a salesman who sell RM5000 worth of water filter in a week receives RM200 plus 9% of RM5000, or a total of RM650. Develop a program that will input each salesman’s gross sales for last week and will calculate and display that salesman’s earnings. Process one salesman’s figures at a time. Also, display the total of the company sales for that week and how much the co % mpany spent for commission payment. Here is a sample input/output.

\*\*\* Weekly Earnings in KuKuKu Water Filter Sdn Bhd \*\*\*

Enter sales in Ringgit (-1 to end): 5000

The salary of salesman 1 is RM 650.00

Enter sales in Ringgit (-1 to end): 1234.56

The salary of salesman 2 is RM 311.11

Enter sales in Ringgit (-1 to end): 1088.89

The salary of salesman 3 is RM 298.00

Enter sales in Ringgit (-1 to end): -1

All salesmen processed.

Total sales are RM 7323.45

Total payroll is RM 1259.11

1. Write a C program that calculates the average number of boxes of cookies sold by the students in a particular Jogathon PASUM event. Use a sentinel value for the program to determine when to stop the input. It should display a report similar to the following sample input/output.

1st run

\*\*\*\* Cookie Sales Information \*\*\*\*

Press Y to enter the program or press any button to exit: Y

Enter student name: Princess

Enter number of boxes sold by Princess: -23

Invalid entry. Re-enter number of boxes sold: 23

Press Y to enter the program or press any button to exit: Y

Enter student name: KingPasum

Enter number of boxes sold by KingPasum: 20

Press Y to enter the program or press any button to exit: Y

Enter student name: QueenKuaz

Enter number of boxes sold by QueenKuaz: 4

Press Y to enter the program or press any button to exit: X

The average number of boxes sold by the 3 students was 15.7

2st run

\*\*\*\* Cookie Sales Information \*\*\*\*

Press Y to enter the program or press any button to exit: X  
No boxes were sold.