

OBJECTIVES : Do While, Data Validation, Nested Loops

Instructors : Burcu LİMAN

Assistants : Engin Zafer KIRAÇBEDEL, Sıla YAPICI

Q1. Write a C program that takes a positive integer number, finds and displays the product of the digits of the given number.

Project Name: LG09_Q1

File Name: Q1.cpp

Example Run:

```
Enter a positive integer: -13
Invalid Input: Please enter a positive integer number.
-2
Invalid Input: Please enter a positive integer number.
0
Invalid Input: Please enter a positive integer number.
-12
Invalid Input: Please enter a positive integer number.
357
Product of digits = 105
```

Q2. Write a C program to find the result of the following sequence. Program gets the value of y from the user. Do not forget to validate y with do..while.

$$z = -\frac{2}{y} + \frac{4}{y^2} - \frac{6}{y^3} + \dots - \frac{14}{y^7}$$

a) Without using powf function

Project Name: LG09_Q2a

File Name: Q2a.cpp

b) Using powf function

Project Name: LG09_Q2b

File Name: Q2b.cpp

Example Run:

```
Enter the value of y: 0
0 is not allowed!
```

```
Enter the value of y: 1
The result is -8.00
```

Q3. A GSM operator has an application with the name **Shake & Win** and gives gifts (call/internet/video & music packages) to its customers. A customer can shake to win at most 3 times.

- 1: Daily 1 GB internet,
- 2: Weekly 10 GB internet,
- 3: Monthly video and Music package,
- 4: 100 mins call package

Write a C program that generates a random number (1-4) and displays an appropriate message for the gift. The customer may want to shake again and get another gift. Your program will continue until the customer wants to stop or the maximum number of shakes is reached.

NOTE : Use **do..while** and **switch** statements!

Project Name: LG09_Q3

File Name: Q3.cpp

Example Run #1:

```
Shake & Win ;)
You won WEEKLY 10 GB Internet

Shake again? (y/n): y

Shake & Win ;)
You won 100 mins. call package

Shake again? (y/n): y

Shake & Win ;)
You won MONTHLY video and Music package
```

Example Run #2:

```
Shake & Win ;)
You won MONTHLY video and Music package

Shake again? (y/n): y

Shake & Win ;)
You won DAILY 1 GB Internet

Shake again? (y/n): n
```

Q4. Write a C program that displays a menu to the screen with the options Addition, Multiplication and Exit. If 1 is chosen, ask how many numbers the user wants to add, if 2 is chosen, ask the user how many numbers to multiply and If 3 is chosen program terminates. Otherwise display the menu again to get correct choice (data validation using do...while).

Example Run:

```
1) Addition
2) Multiplication
3) Exit
Enter your choice: 5

1) Addition
2) Multiplication
3) Exit
Enter your choice: 1

How many number do you want to add? 3
Enter 1. number:2.7
Enter 2. number:5.4
Enter 3. number:3.6
The result of addition is 11.70
```

```
1) Addition
2) Multiplication
3) Exit
Enter your choice: 2
How many number do you want to multiply? 2
Enter 1. number:4
Enter 2. number:2
The result of multiplication is 8.00
```

```
1) Addition
2) Multiplication
3) Exit
Enter your choice:3
```

Project Name: LG09_Q4

File Name: Q4.cpp

Q5. A primary school offers a weekend activity as shown below:

1. Gymnastics
2. Basketball
3. Piano
4. Traditional Dance
5. Analytical Thinking

The price for each activity is **1500 TL**, except for Piano, which costs **2000 TL**, and Analytical Thinking, priced at **1750 TL**. Each school member can participate in a maximum of three (3) activities. The program displays the menu to the members until the user enters any character other than 'y'. After exiting the menu, the program will show the total payment that the member will pay. **Do not forget to make data validation for the menu choice.**

Example Run#1:

```
WEEKEND ACTIVITY PROGRAM
1. Gymnastics
2. Basketball
3. Piano
4. Traditional Dance
5. Analytical Thinking
Enter your choice: 9
Wrong Choice!

WEEKEND ACTIVITY PROGRAM
1. Gymnastics
2. Basketball
3. Piano
4. Traditional Dance
5. Analytical Thinking
Enter your choice:1
Do you want to select new activity (limit is 3):y

WEEKEND ACTIVITY PROGRAM
1. Gymnastics
2. Basketball
3. Piano
4. Traditional Dance
5. Analytical Thinking
Enter your choice:3
Do you want to select new activity (limit is 3):n

Total payment is 3500.00
```

Example Run2:

```
WEEKEND ACTIVITY PROGRAM
1. Gymnastics
2. Basketball
3. Piano
4. Traditional Dance
5. Analytical Thinking
Enter your choice: 2
Do you want to select new activity (limit is 3): y

WEEKEND ACTIVITY PROGRAM
1. Gymnastics
2. Basketball
3. Piano
4. Traditional Dance
5. Analytical Thinking
Enter your choice: 4
Do you want to select new activity (limit is 3): y

WEEKEND ACTIVITY PROGRAM
1. Gymnastics
2. Basketball
3. Piano
4. Traditional Dance
5. Analytical Thinking
Enter your choice: 5

Total payment is 4750.00
```

Project Name: LG09_Q5
File Name: Q5.cpp

Additional Questions

AQ. A well-known carpet company opened a new store in Ankara. The company organized a special campaign for the opening day of the store. The unit price of the carpet per square meter is **112.50 TL**. The company gives 65% discount for only one lucky customer.

Write a C program that gets the number of waiting customers from the user. To find the lucky customer, a random number is generated for the waiting customers (*1 to noOfCustomer*). For each customer; read the square meter of the purchased carpet then calculate the price to be paid. The lucky customer gets 65% discount. Others will pay their price without discount. Finally, the program displays the total payment for the company.

Example Run:

```
Enter the number of waiting customers: 3
```

```
Enter the area of your carpet: 65  
You should pay 7312.50TL
```

```
Enter the area of your carpet: 25  
CONGRATULATIONS!! YOU WON AN EXTRA %65 DISCOUNT!!!  
You should pay 984.38TL
```

```
Enter the area of your carpet: 10  
You should pay 1125.00TL
```

```
The company earned 9421.88 TL from the opening day.
```

Project Name: LG09_AQ

File Name: AQ.cpp