Department of Computer Engineering
Department of Software Engineering

CENG113 / SENG113 - Computer Programming 1
Fall 2021 - 2022

Lab Guide #3 – Week 4

OBJECTIVE : To get acquainted with the IDE You will learn how to: 1. Built-in functions, solving simple arithmetic problems, If statement/s, Compound statements
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1. Write a program that calculates following expressions:

a=2,

b= the largest integral value that is not greater than e^a → e.g: if 'a' is 31.4, 'b' is 31

c=$\sqrt[5]{(a*b)^3}+3*10$

d=$\left(\left(\sqrt[5]{(a*b)^3}\right)+3\right)*10$

e=$b > a\ AND\ c \geq a\ OR\ d = b$

f=$(b > a\ AND\ c \geq a\ OR\ d) = b$ → for e and f: first equals sign is assignment; second one is comparison operator.

Note: You are not allowed to use additional variables other than a,b,c,d,e,f. Each calculation for each variable should be done in one line.

Example Run:

```
a: 2.000000, b: 7.000000
c: 4.871658, d: 0.787166
e: 1.000000, f: 0.000000
```

Project Name: LabGuide3_1
File Name: Question_1.cpp

2. Please assign the variables as int a = 5, b = 5, c = 10, result. Compare these values using logical operators and show the result.

- use **AND** operatör
- use **OR** operatör
- use **NOT** operatör

```
Output:
(a == b) && (c > b) is 1
(a == b) && (c < b) is 0
(a == b) || (c < b) is 1
(a != b) || (c < b) is 0
!(a != b) is 1
!(a == b) is 0
```

Project Name: LabGuide3_2
File Name: Question_2.cpp

3. Write a C program that finds two double numbers, when their sum and product are given.
Hint: One of the roots of a quadratic equation ($ax^2 + bx + c = 0$) can be calculated using the formula below. Assume that a=1, b=-sum and c=product

$$x1= \frac{-b+\sqrt{b^2-4ac}}{2a}$$

Example Run:
```
Enter the sum of the numbers: 21.6
Enter the product of the numbers: 48.9
These numbers are 19.0 and 2.6
```

Project Name: LabGuide3_3
File Name: Question_3.cpp

4. Write a program that shows the penalty according to your velocity. Here are the rules for penalties.
Less than 0 -> Wrong value
Between 0-50 -> No penalty
Between 51-70 -> 374 TL
Between 71-90 -> 652 TL
Greater than 90 -> 1340 TL

Example Run 1:
```
Penalty calculation for the vehicles
Less than 0 -> Wrong value
Between 0-50 -> No penalty
Between 51-70 -> 374 TL
Between 71-90 -> 652 TL
Greater than 90 -> 1340 TL

Enter your velocity: 88
Your penalty is 652 TL!
```

Example Run 2:
```
Penalty calculation for the vehicles
Less than 0 -> Wrong value
Between 0-50 -> No penalty
Between 51-70 -> 374 TL
Between 71-90 -> 652 TL
Greater than 90 -> 1340 TL

Enter your velocity: -22
Wrong value!
```

Project Name: LabGuide2_4
File Name: Question_4.cpp

5. Write a program decides whether you can work or not according to your age.

Assume that:
Between 0-17 can't work.
Between 18-65 can work.
Greater than 65 can't work.

Example Run 1:
```
Enter an age: 18
You can work
```
Example Run 2:
```
Enter an age: 66
You can't work
```

Project Name: LabGuide2_5
File Name: Question_5.cpp