Department of Information Systems and Technologies

CTIS221 – Object Oriented Programming

SPRING 2024 - 2025

Lab Guide 2

Week 3 - 2

OBJECTIVES : Primitive Data Types, Operations and Methods

Instructor : Leyla SEZER
Assistant : Efe Mert ŞAHİNKOÇ, Engin Zafer KIRAÇBEDEL

Q1. Write a java program to compute and display a person's weekly salary as determined by the following criteria:
If the hours worked are less than or equal to 35, the person receives 10$ per hour;
Else the person receives 220$ plus 16$ for each extra hour worked over 35 hours.

The program should request the hours worked as input and should display the salary as output.

Example Run #1:

```
Enter worked hour: 19
Amount of the salary to be paid: 190.00$
```

Example Run #2:

```
Enter worked hour: 48
Amount of the salary to be paid: 428.00$
```

Q2. Write a Java program that displays three book types as options; *Hardcover*, *Paperback*, and *EBook* on the screen, and gets a type and the number of books to be entered from the user (**H/h:** Hardcover, **P/p:** Paperback, **E/e:** EBook). According to the book type, your program will get specified number of book cost from the user, calculate and display the total cost and VAT (KDV). For Paperback the VAT percentage is **8%**, for Hardcover **12%**, and for EBook **5%**. Beware of using decimal points according to your regional settings of your PC (For Turkish use **","** for English use **"."**).

Example Run #1:

```
H. Hardcover
P. Paperback
E. EBook
Enter the type of book(H/h: Hardcover, P/p: Paperback, E/e: EBook): a

H. Hardcover
P. Paperback
E. EBook
Enter the type of book(H/h: Hardcover, P/p: Paperback, E/e: EBook): h

How many books do you want to enter: 5
Enter 1. item's cost in TL: 12
Enter 2. item's cost in TL: 4.5
Enter 3. item's cost in TL: 6.2
Enter 4. item's cost in TL: 3.3
Enter 5. item's cost in TL: 5

Total cost: 31.00 TL
Total VAT: 3.72 TL
```

Example Run #2:

```
H. Hardcover
P. Paperback
E. EBook
Enter the type of book(H/h: Hardcover, P/p: Paperback, E/e: EBook): p

How many books do you want to enter: 2
Enter 1. item's cost in TL: 24
Enter 2. item's cost in TL: 10

Total cost: 34.00 TL
Total VAT: 2.72 TL
```

Q3. Write a Java program for the number guessing game.

- Display a menu of 2 choices, as 'P' / 'p' to start playing the game and 'E'/ 'e' to exit the program. Then take the choice as input.
- If the selection is playing the game, then generate a random number between 1 and 10, which is a secret number that the player is supposed to guess correctly.
- If the user guesses the number correctly then the program should congratulate the player as shown in the example run #1 and exit.
    - Otherwise the program should tell the player that she/he couldn't guess the number correctly, as in the example run #3.

Example Run #1:

```
P. Play the number guessing game
E. Exit game
p

Please guess a number between 1 and 10 : 3

Congratulations, you have guessed number 3 correctly.
```

Example Run #2:

```
P. Play the number guessing game
E. Exit game
e

Exit successful.
```

Example Run #3:

```
P. Play the number guessing game
E. Exit game
p

Please guess a number between 1 and 10 : 4

You couldn't guess correctly, the number is 1.
See you again next time.
```

Example Run #4:

```
P. Play the number guessing game
E. Exit game
z

Incorrect input!
```

Q4. Write a Java program for the **Traffic Penalty Payments**. The Penalty fines are as follows:

Speed Limit Violation:	2167 TL
Red Light Violation:	1506 TL
Parking Violation:	993 TL

If the payment is done before the deadline 25% discount will be applied. Display a menu with the following options:

```
TRAFFIC PENALTY PAYMENTS
------------------------
1. Speed Limit Violation
2. Red Light Violation
3. Parking Violation
4. EXIT
```

The program asks the user to choose a penalty article number, then the program calculates and displays the **payment amount** (if the payment is done before the deadline, then 25% discount will be applied). The program will stop when the user wants to EXIT (4 is given as choice). Finally, the program displays the **total payment amount** and the **total number of people** who paid the penalty before the deadline.

Example Run:

```
TRAFFIC PENALTY PAYMENTS
------------------------
1. Speed Limit Violation
2. Red Light Violation
3. Parking Violation
4. EXIT
Enter the penalty article no: 1
payment before deadline (y/n)? n
Payment Amount: 2167.00 TL
```

```
TRAFFIC PENALTY PAYMENTS
------------------------
1. Speed Limit Violation
2. Red Light Violation
3. Parking Violation
4. EXIT
Enter the penalty article no: 2
payment before deadline (y/n)? y
25% discount applied for the early payment!!
Payment Amount: 1129.50 TL

TRAFFIC PENALTY PAYMENTS
------------------------
1. Speed Limit Violation
2. Red Light Violation
3. Parking Violation
4. EXIT
Enter the penalty article no: 3
payment before deadline (y/n)? y
25% discount applied for the early payment!!
Payment Amount: 744.75 TL

TRAFFIC PENALTY PAYMENTS
------------------------
1. Speed Limit Violation
2. Red Light Violation
3. Parking Violation
4. EXIT
Enter the penalty article no: 4

--------------------------

Penalty totals: 4041.25 TL
2 people paid the penalty before the deadline
```

ADDITIONAL QUESTIONS

AQ1. Write a java program for the following problem.

- A company has 5 workers. It gives 12.5% salary increase to its workers whose salaries are less than 40000 TL, and 11% salary increase to the other workers.
- The company has a savement box and some of the workers are members of this box. 13% of the salary of a worker is cut to be put into that box if the worker is a member of the savement box.

Given the ID, the amount of the previous salary, and information about the membership to the savement box (Y means member, N means not) of each worker, display the ID and the new salary of each worker.
Display also the number of workers who are members of the savement box, and the total amount of money saved into the box. **(Do not forget to check invalid savement box type as in the example run.)**

Example Run:

```
Enter ID and salary of a worker: 123 18500
Is the worker a member of the savement box (Y for yes, N for no): y
Worker ID: 123
New Salary: 18106.88 TL

Enter ID and salary of a worker: 234 14500
Is the worker a member of the savement box (Y for yes, N for no): n
There is no cut for savement box
Worker ID: 234
New Salary: 16312.50 TL

Enter ID and salary of a worker: 345 50000
Is the worker a member of the savement box (Y for yes, N for no): t
!Invalid Character!

Enter ID and salary of a worker: 577 145000
Is the worker a member of the savement box (Y for yes, N for no): y
Worker ID: 577
New Salary: 140026.50 TL

Enter ID and salary of a worker: 753 50000
Is the worker a member of the savement box (Y for yes, N for no): n
There is no cut for savement box
Worker ID: 753
New Salary: 55500.00 TL

2 workers are members of the savement box.
23629.13 TL has been saved in the box
```

AQ2. A library has two floors. The librarians plan to transfer some books from the second floor to the first floor on weekly basis for a few weeks. Write a java program that gets the number of books on each floor, the number of books to be transferred per week and the number of weeks that the transfer operation will be performed from the user. Then, it displays the initial number of books on each floor and the number of books at the end of each week. If there are not enough books to move, the program should display a warning message as in the example run.

Example Run #1

```
Enter the number of books on the 1st floor: 120
Enter the number of books on the 2nd floor: 98
Enter the number of books to be transferred: 20
Enter the number of weeks: 5

WEEK  1st Floor  2nd Floor   MOVED
*********************************
 0       120          98       0
 1       140          78      20
 2       160          58      40
 3       180          38      60
 4       200          18      80

There are not enough books to move on the 2nd floor!
```

Example Run #2:

```
Enter the number of books on the 1st floor: 4500
Enter the number of books on the 2nd floor: 150
Enter the number of books to be transferred: 50
Enter the number of weeks: 5


WEEK  1st Floor  2nd Floor   MOVED
*********************************
 0      4500         150       0
```

```
 1      4550         100      50
 2      4600          50     100
 3      4650           0     150

There are not enough books to move on the 2nd floor!
```

Example Run #3:

```
Enter the number of books on the 1st floor: 240
Enter the number of books on the 2nd floor: 160
Enter the number of books to be transferred: 20
Enter the number of weeks: 8

WEEK  1st Floor  2nd Floor   MOVED
*********************************
 0       240         160       0
 1       260         140      20
 2       280         120      40
 3       300         100      60
 4       320          80      80
 5       340          60     100
 6       360          40     120
 7       380          20     140
 8       400           0     160
```