Assignment 2: Dynamic Programming

ASSIGNMENT TOP SHEET
Faculty of Information Technology
Department of Computer Science

Student Number :	Course Name & Code : Algorithms Design & Analysis - 0401316

Deadline for Submission(s): 30th of May, 11:59 pm (E-learning System)

Student's **Surname**	Student's **First Name**

Lecturer Name: **Dr Ahmed Al-Hmouz**

Assignment Details: How Dynamic Programming works?

Instructions to Student:

Please note: Work presented in an assessment must be the student's own. Plagiarism is where a student copies work from another source, published or unpublished (including the work of a fellow student) and fails to acknowledge the influence of another's work or to attribute quotes to the author. Plagiarism is an academic offence.

The course learning outcomes addressed by this assignment:

1. Describe the Dynamic-programming, Greedy, and Graph algorithms and explain when an algorithmic design situation calls for it.

Note: answer all questions (15 Marks).

0-1 Knapsack:

1. **Difference between the Knapsack we took on class and 0-1 Knapsack?**
2. **Why Greedy method fails in 0-1 Knapsack?**
3. **Explain the problem and solution with detailed example showing optimal substructure and recursive equation.**
4. **Provide the pseudocode for 0-1 Knapsack?**
5. **Explain the time and space complexity?**

Hint: use "Introduction to Algorithms" text book, it is uploaded on the "E-learning system".
NOTE: this assignment is a group assignment (same members), same criteria will be applied (Cooperation, Understanding, Solution).