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CS 6850 FALL 2021: PROJECT & DEMO
PLANNING WITH STATES
Instructor Dr. N. Bourbakis

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Demo in Person GROUP-1: Nov. 30, 2021 - Time: 7:10pm – 9:10pm, in class room
Demo in Person GROUP-1: Dec. 03, 2021 - Time: 2:30pm – 7:30pm, in class room

Deliverable: **(1) A Professional typed Report that explains the methodology and the results; (2) the corresponding executable and source Code (C++) and (3) the PPt presentation file**
Deliverable Due time: Dec 10, 2021, 11:59:59 pm.

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NO PROJECT WILL BE ACCEPTED AFTER THE DEADLINE

<u>AI-6850 GRADUATE STUDENTS ONLY:</u>

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Consider the state space for the Blocks World that includes:
 (1) Fourteen blocks **(a, b, c, d, e, f, g, h, i, j, k, l, m, n);**
 (2) The relations among the blocks (ABOVE, ON, CLEAR, TABLE); and
(3) There are only **two locations** (L1, L2) on the table for blocks possible placement;
(4) the **functions or actions** {PICK-UP(Li), PUT-DOWN(Li), STACK(Li), MOVE(Li), UNSTACK(Li), NOOP}; where, Li represents either a location on the table or a stack of blocks at that location on the table}; you program must perform the sequence of actions on the blocks by a **two robotic arms with box grasping capabilities**. <u>Each robotic arm can perform one action</u> on **one box** at a time. For the transition from one state to the next state your program **must** use the appropriate functions (actions) logically needed.
Develop an optimum(*) algorithmic method (**write the code in C++ language**) that accepts:
 (i)   as inputs a given scene (**starting state of these blocks** {which is their **initial** placement on the table (T) using the locations or their placement on each other};
 (ii)   a final scene (**destination state**) for these blocks and
 (iii)   generates and displays the sequence of all consecutive scenes (**or states**) that lead from the <u>starting state to the destination state.</u>
The **starting and the destination** states will be given to you by me at the demo time and you will run your code proving that works at that time and for all possible scenarios.
(*) By optimum I mean the algorithm with the smallest number of actions (steps) to obtain the results each time. **Projects that run beyond to the available 10 minutes time frame will be stopped and loose points.**

Presentation (10 minutes). The instructor will provide to you initial and final states.
YOU MUST EXPLAIN HOW YOUR METHODOLOGY WORKS, IN BRIEF (use a flow chart);
YOUR DEMO MUST HAVE VISUAL REPRESENTION OF THE BLOCKS PLACEMENTS IN SEQUENTIAL STATES UNTIL TO REACH THE DESTINATION
IF YOUR CODE DOES NOT WORK DURING THE DEMO TIME YOU WILL LOOSE 50% OF THE POINTS. AFTER THE PRESENTATIONS (DEMOS) NO COMMUNICATION ABOUT YOUR PROJECTS WILL BE ACCEPTED;
NO FINAL REPORTS WILL BE ACCEPTED AFTER THE DEADLINE, Dec. 10, 2021.

WRITTEN TECHNICAL REPORT
Outline Mandatory
Technical Reports with handwriting will be rejected no points.
Incomplete Technical Reports loose points
Plagiarism is not accepted.

- **Title** (type the names of the participants and the date) 1 page
- **Abstract** (provide a brief description of the context of the entire report) 1 page
- **Table of context** (provide the subtitles of the main paragraphs) 1 page
- **Introduction** (explain in brief the (i) motivation, (ii) the goals, (iii) overall organization, of the technical report) and (iv) results proving that your method works1-2 pages
- **Main sections** (describe in detail all the main parts of the technical report)
  Methodology (written text)
  Methodology's Flowchart;
  Include the results from two experiments of your choice;
  The length (in pages) of each of these sections varies according to the authors approach
- **Conclusions** (provide a brief description of the outcomes of this report) 1 page
- **References** (cite the places (books, reports, classnotes, articles, etc.) that you used to support your report.

ALL THE DELIVERABLES WILL BE EITHER SEND BY EMAIL TO MY PERSONAL EMAIL OR YOU PROVIDE A CD OR USB AND DROP IT IN MY MAILBOX IN THE CSE DEPT.

Good luck.