Honors Projects in CS II: Selected Programming Assignments with Emphasis on Research–Based Problems (A Bridge From Community College to UTEP/NMSU)

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Abstract

The Elementary Data Structures and Algorithms (CS 2), is one of the three fundamentals in computer science courses that students must complete at El Paso Community College in order to: (1) obtain an associates in arts in computer science, (2) transfer to a four-year institution degree in Computer Science (e.g., UTEP/NMSU). In these courses, we provide several instruments to articulate the established Student Learning Outcomes (SLOs) (e.g., quizzes, tests, programming labs, final exam). Intentionally, it is desired to motivate students with real–life scenarios in the classroom [1], so students be aware about the current challenges in industry, research, and workforce. Therefore, we include several programming assignments (labs) with a direct application to relevant problem/solving scenarios [2]. In addition to the already mentioned instruments, students who are part of the honor's program are require to develop extra assignments that will enhance their study skills (in the computer science case, to enhance their problem–solving and programming skills).

For the students who are in the honors program, we developed a set of assignments that are subsets of current UTEP's research problems in different research areas including: biometrics applications (considering uncertainty), computer security, algorithm analysis and complexity, and bioinformatics applications. The purposes behind these assignments are:

- to enhance student's problem–solving and programming skills,
- to provide familiarity with UTEP actual research projects,
- to expose students to present a problem with their possible solution in different academic events,
- to prepare students for the workforce and internships/co–ops.

In this talk, we present a set of programming assignments that are taught in the Fundamentals of Computer Programming (CS II) course that are considered to be research-oriented problems designed exclusively to honors' students.

References

[1] C. Servin, "Computer Programming Assignments Based on a Progressive and Constructive Approach", *Proceedings of the 2013 International Sun Conference on Teaching and Learning*, El Paso, Texas, Feb 28th – March 1st, 2013.

[2] C. Servin, "Practices in Elementary Data Structures and Algorithms with Focus in Secure Programming", *Proceedings of the 2014 International Sun Conference on Teaching and Learning*, El Paso, Texas, Mar 5th – 7th, 2014.