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ELEC 3225 – 01

Assignment 2

5/30/2021

**Waterfall**

1. *Requirement definition: (Estimated time of completion for whole system – 14 weeks)*
   1. There needs to be 3 types of users that can access the system.
      1. Students
         1. Will be able to register for classes, see available course, and see their own schedule.
      2. Instructors
         1. Will be able to see available courses as well as their own class’s roster.
      3. Admin
         1. Can see all students/instructors as well as courses/rosters.
         2. Can edit the courses, users, and schedules.
   2. There needs to be databases.
      1. Database of users
         1. There needs to be up to 100 students, 10 instructors, and 1 admin.
      2. Database of courses
         1. This will contain all CRNs for courses, their names, times, and the instructor for the course.
   3. System needs to include multiple semesters, print out of schedules, and scheduling preferences.
2. *System and software design: (Estimated time of completion for software/system design – 8-9 weeks)*
   1. User Interface *(Estimated time of completion – 1.5 weeks)*
      1. Command line, menu style interface for users
         1. Switch cases dependent on users’ choice
            1. Function calls depending on choice to access member functions.
   2. Objects/classes *(Estimated time of completion for objects/classes – 2.5 weeks)*
      1. Base class for user
         1. Attributes include: first/last name, ID number.
      2. Derived classes
         1. Students
            1. Included functions: search courses, add/drop courses, print schedule.
         2. Instructors
            1. Included functions: print class list, print schedule, and search courses.
         3. Admins
            1. Included functions: add/remove courses to system, add/remove users, add/remove students from courses, and search/print rosters and courses.
   3. Databases *(Estimated time of completion for databases – 3 weeks)*
      1. There will be two databases.
         1. One database to contain all users (students, instructors, and admins)
         2. Another database containing all courses and course information (CRNs, instructors, course name, time)
3. *Implementation and unit testing: (Estimated time of completion for implementation and testing – 2 weeks)*
   1. The language that will be used is C++.
   2. The following functions will be tested to assure proper functionality.
      1. User
         1. Constructor - make sure base constructor is called properly to assign attributes the correct values.
         2. Set functions – ensure the attributes that are being set are storing correct values.
         3. Get functions – ensure the get functions are returning the right values.
      2. Student
         1. Constructor - make sure base constructor is called properly to assign attributes the correct values.
         2. Add/drop functions – will pass an integer/string depending on the course that is being added/dropped.
         3. Print – making sure the right courses are printed and formatted in an orderly fashion.
         4. Search – passing in a string/int to search the database for the correct course and showing proof of functionality.
      3. Instructor
         1. Constructor - make sure base constructor is called properly to assign attributes the correct values.
         2. Prints – ensuring the proper information is printed and formatted in an orderly fashion.
         3. Search – passing in an int/string to search and returning the desired course or alerting that the course could not be found.
      4. admin
         1. constructor – make sure base constructor is called properly to assign attributes the correct values.
         2. Add/remove functions – passing in int/string values that are to be used to add or remove users/courses.
         3. Search functions – ensuring that the passed in values (int/string) can locate the desired entity and return that it is either found or not.
         4. Print – making sure the right information is printed neatly.
4. *Integration and system testing: (Estimated time of completion for system testing – 1-2 weeks)*

Taking the code from software and system design and based on the results of implementation and unit testing, putting the functions together with the databases in order to interact with the user via the UI. Testing of the overall program and that the separate components interact together by compiling, running, and debugging the overall project to ensure that all needs are met, and the fixes can be made.

1. *Operation and maintenance: (Estimated time of completion for maintenance – 1-2 weeks)*

After testing the program in the previous step, the next step is to use debugging tools made available to use in the IDE we are working in to fix the bugs to ensure the program runs smoothly and update based on any changes or components that may not be fully implemented based on the requirements.