**CS 4080 (Yang) Capstone Project (100 points)**

**Topic: Evaluation of a Modern Programming Language**

**Goal:** Learn and evaluate a modern programming language new to each team.

Due date for each stage will be announced in the lecture meetings and posted on blackboard.

***Stage 1: Team and language selection***

Submit on blackboard names of all team members. A team should consist of 2-3 students (talk to instructor if less than 2 or more than 3). Each team should select 3 modern programming languages as team’s preference (submit on blackboard).

Action: post team info and language choices on blackboard discussion board by due date.

Soon after due date each team will receive your language assignment on blackboard.

***Stage 2: Learn the assigned new programming language***

Action: Each team will present a 3-5 minutes presentation/demo briefing the language features and running 1-2 simple programs (e.g. sorting, menu-driven services such as pizza order, …)

***Stage 3:*** ***Real-world problem selection*** (Note: this stage may be in parallel with Stage 2).

Action: Each team post the choice(s) on discussion board.

Sample real-world problems: Cryptanalysis, big data processing and visualization, image processing, gaming, fractals, animating the solar system, …

***Stage 4: Progress report***

Action: Team work on the implementation of the real-world application program. The application program should demonstrate main features of the language and should not be trivial. Progress will be checked during the class meetings (informal, oral report.)

***Stage 5: Team presentation***

Presentation guidelines: summarize or highlight important design features of the language, including but not limited to the following in your presentation: (If part of the contents already presented in stage 2, keep these materials in your slides but skip them in the presentation.)

* 1. Language evolution: Who designed this language? For what purpose or why this language came out? …
  2. Fundamental as well as advanced features of the language such as control structures, data types, program units, exception handing etc. as discussed in Chapter 5 through Chapter 14. You may compare its features with features of other selected languages. (Note: don’t discuss all features in details. After a brief discussion of main features, each team should focus on one or two features. Use sample codes to demonstrate the features of the language.)
  3. Demo and briefly explain your real-world application program.

Each team will present about 10-15 minutes and all presentations will be evaluated by class members. Presentation schedule will be posted on blackboard.

***Stage 6: Final submission***

Each team should submit a copy (one per team) of its presentation slides (pptx file) as well as the source code of the real-world application program on blackboard under Capstone Project link no later than 24 hours after team’s presentation. Note: your slides should include screenshots of some key outputs of your program.

**Grading Criteria:**

Stage 1 submission (10 pts) – timely submission with all required information.

Stage 2 short presentation (10 pts) – good progress towards learning the language.

Stage 3 submission (5 pts) – timely submission of problem choice.

Stage 4 progress report (5 pts) – good progress towards problem implementation.

Stage 5 presentation (50 pts) – quality of language feature coverage, quality and level of difficulty of application program.

Stage 6 submission package (10 pts) – timely submission of all required documents.

Miscellaneous activities (10 points) – coordination of teamwork, evaluation of presentations, etc.

Note: penalty applies for changing of selection/choices after submission, late or not showing (or last minute rescheduling of presentation), etc.