

Group Project of ELEC 7078 Subclass A

– Human Computer Interaction (2024/25, Semester 2)

* **Final Group Report [17%] & S/W [8%]** Submission Deadline: May 7 (Wed), 2025 at 23:59.

Total : 25% of CA

* **(Final Report + S/W) [in .zip] should be submitted via the course Moodle webpage at the HKU portal.**

This group project specification contains the following items:

1. Rules of this group project	p.1 - 2
2. Standardized Evaluation Criteria for all groups	p.2 - 3
3. Project Timetable	p.3
4. Checklist for Submissions for EACH group	p.4 – 5
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<i>Project 2: A Data Analytics Software for Computational Finance</i>	<i>p.8 – 9</i>

* For each of the above projects, in the final report, each group should submit the finalized design and prototype implementation of a Python desktop application OR a mobile application. The mobile application can be either the Android, Python/Kivi or Apple iOS (if the group is more familiar with the iOS platform) application.

RULES:

- ✓ **Grouping**: To encourage the spirit of teamwork in industry, each group should consist of 3 ~ 4 (max.) members. Each member should take up equal share of work, and be actively involved throughout the analysis, design, implementation, testing and documentation phase. Any member who is **not involved in any part of the group project will immediately receive zero mark for that part** as clearly defined in this project specification. Any student who fails or feels reluctant to pair up with another student can form a single-person team who can choose freely to work on any of the 2 suggested projects. However, there will be **no extra bonus to be given to such single-person group though the concerned student can be allowed to work a reduced scope after seeking the approval from Dr. Vincent Tam**. Each submission should be evaluated primarily on the “quality” of the work.

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- ✓ **Submission**: For the final report, each group is required to submit only ONE single copy. For the final report, all the source programs/files (such as .html, .py, etc.) required to **successfully build** the ultimate graphical user interface (GUI) should be included in the ZIP file. Otherwise, no mark will be given to the S/W part. To **ensure standardization and fairness** across all the group projects, students are restricted to use the Python Programming to implement their designed GUI of the desktop app. For the mobile app, students can use either the Android SDK, the Apple Xcode IDE or any Python framework such as the Python/Kivi. If any group uses any publicly available Python library downloaded from the Internet or other source, they should duly acknowledge/declare the source(s) in their final report as the University has a strict policy on plagiarism (URL : <https://tl.hku.hk/plagiarism/>); otherwise, NO mark will be given to S/W part.

To standardize the evaluation strategies of different projects, the SAME evaluation criteria were SET for EACH group project as follows:

Evaluation Criteria	Marks
About the FINAL REPORT :	
A) Clarity and Presentation of the Final Group Report (i.e. whether the report can clearly present any modification from the initial design to final design , justify the reasons behind such modification , and the detailed final design [including the interaction style(s), user models, state diagram(s), the logic-flow (control) diagram, event handling mechanisms, data-flow diagram, and the detailed human/technical factors considered, and all the main findings including the weakness and strengths of the implemented system/interface on the desktop app versus those of the mobile app]?)	12%
B) Clarity and Presentation of the submitted Test-and-Evaluation Plan (i.e. whether the test plan is concise and clear enough to direct an effective testing on the “basic functionalities”? whether the evaluation plan is carefully planned and detailed enough to consider most average and exceptional cases ?)	5%
	Sub-total = 17%

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About the S/W Implementation :	
A) Clarity of the S/W Documentation = Source Programs (i.e. whether the source programs contain sufficient and clear comments ?)	2%
B) Basic Functionalities of the submitted S/W for desktop or mobile application (i.e. whether the S/W satisfies the system specifications stated under each topic?)	6%
Sub-total = 8%	

- Each group will be roughly given around 6 weeks (now to May 7, 2025) to design, implement and prepare documents for the chosen group project. Below is our briefly “suggested” timetable of 6 weeks for each team to manage his/her own group project:

Suggested Activities	Duration
a) Analysis & Design	1.5 weeks
b) Implementation	2 weeks
c) Testing and Improvement	1 weeks
d) Preparing Documents for Group Submission	1.5 week

** Students are gently reminded that each group project should NOT be focused on as a “programming exercise” as obvious from the above mark allocations that only 8% (out of 25% in total) are directly related to the S/W produced. During marking, we would carefully evaluate on the problem analysis, design principle and practical issues (such as human factors) considered, and the completeness of the evaluation plan. Therefore, to ensure fairness, we may ONLY provide some relevant reference material on Python or Android programming, and may NOT be able to provide “any specific technical support” for each individual student/group due to our limited manpower.

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A Checklist of Items Required for the Submission of Each Group

**** Each of the following submission items should be identified with each student's FULL NAME & UNIVERSITY NUMBER printed on the cover page of the concerned document.**

Items for Submission	Details
i) Source Programs of the S/W (like xx.py for Python programs) + any library file required for the successful interpretation and execution of the implemented S/W	If extra libraries are required for compilation/execution, please include in your ZIP file. Also, for some specific compilation/execution setting, please include an "README.txt" to clearly explain.
ii) The Final Group Report (at least 6 pages per group excluding the program listings) which should at least contain the following discussion: <ul style="list-style-type: none">- Problem Definition (if any);- Basic Functionalities of the Responsible Sub-System;- Design Approach/Principles Used;- The Targeted USER GROUP;- (Human/Environment) Factors Considered;- Strength and Shortcomings of Existing Sub-System;- Future Extensions/Improvements (if more time is given).	For clarity, each report should have a "Table of Content" after the cover page. Also, each page of the report should be numbered on the lower RHS corner.
iii) User Manual (at least 1 page) to explain to the "targeted user groups" how to use the basic/extra functionalities of the implemented sub-system or functions + ALL Program Listings (no page limit !) for each Group submission	The user manual should be clearly written for the targeted user groups to learn to use the basic functionalities.
iv) A Separate Test-and-Evaluation Plan (at least 1 page) to clearly explain to marker how to TEST and EVALUATE the concerned functions/sub-system for each Group submission. Accordingly, it should contain at least two parts: <ul style="list-style-type: none">a. TEST PLAN – how to use a step-by-step approach to test all the basic functionalities of the implemented sub-system satisfied the system specification stated in this specification; You should also include the average and exceptional cases for testing in this part!b. EVALUATION PLAN – In case you're allowed to send to different users for evaluation, how would you set up the evaluation scheme (e.g. questionnaires or on-site	

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<p><u>evaluation, etc) and what evaluation criteria you should use to determine the success/effectiveness of your implemented sub-system.</u></p>	
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** : item i), ii), iii) and iv) to be compressed into **1 single ZIP file named “Grp-XX -Final-Report.ZIP”** for submission via **the course Moodle webpage at the HKU portal** by May 7 (Wed), 2025 at 23:59, where XX is the assigned group number.



Project 1: An Educational Game for School Kids with Special Needs

No matter on desktop computers or mobile devices, the huge demand for educational games is growing very fast in the past decade. And the trend of growth will continue. However, carefully designed educational games for school kids with special needs are often ignored in many places including Hong Kong or other regions. School kids with special needs may refer to those with different levels / types of learning difficulties such as the attention deficit hyperactivity disorder (ADHD – url at: http://en.wikipedia.org/wiki/Attention_deficit_hyperactivity_disorder OR http://kidshealth.org/teen/school_jobs/school/adhd.html), reading disability or dyslexia (url at: http://en.wikipedia.org/wiki/Reading_disability) OR other growth development problems. In this project, you should design an educational game for kids with special needs. The medium of instructions is English to cater for both the Asian and global markets. In general, the targeted end-users fall in the age range of 6 ~ 12 years old for school kids. In case you do not agree, you can specify your own targeted age range, say from 12 ~ 16 in your design. Besides, you need to clearly state about the specific level / type of learning difficulties like the ADHD or dyslexia that your educational game is targeted at. It should be noted that educational games differ from general computer games for entertainment that they should have an educational purpose, like helping the teenagers with special needs to learn about some important concepts in Science or Maths, daily living / survival skills, pronounce or spell a word for learning languages (Chinese or English, etc.), etc. The rules of the game should be easy-to-understand as according to the properties of the different age groups and the level / type of learning difficulties. After all, sounds and colors should be used whenever appropriate to attract the teen's attention.

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The software should have a carefully designed and easy-to-understand introduction screen with several options (as menu items or check-buttons) representing different levels of difficulty (easy, intermediate, most difficult, etc.) for the kids with special needs to play around with. The detail of different parts of the game should be clearly explained via the online help facility. The prototype implementation of this project is completely up to the individual group. No extra bonus will be given to any networked educational game. However, when you design your educational game to run on desktop computers, you should also consider how some selected features can be implemented & run on mobile devices like iPhone, iPod/iPad, or Android devices since the small screens of mobile devices present certain challenges to GUI design.

Below are some suggested links for reference on educational games – Please DO NOT copy your game from such or any other links:

http://en.wikipedia.org/wiki/Attention_deficit_hyperactivity_disorder

<http://www.nimh.nih.gov/health/publications/attention-deficit-hyperactivity-disorder/complete-index.shtml>

http://en.wikipedia.org/wiki/Reading_disability

<http://www.do2learn.com/>

<http://a4cwsn.com/apps/apps-a-z/>

<http://www.time4learning.com/learning-special-needs.shtml>

Project 2: A Data Analytics Software for Computational Finance

In the area of computational finance or financial engineering, many analysts, financial engineers or investors will employ different software tools to perform critical analysis on the stock data such as the stock prices including the current price, the daily open/closing price, the daily high/low price, and/or volumes, etc. On top of it, there are various technical indicators such as the 10-day, 20-day and 50-day moving averages (MA's), relative strength indicator (RSI), the Bollinger bands, etc. to gauge / estimate the relative performance of different stocks in the stock market. Due to the volatility and fluctuations of the local / global stock markets in recent years, the uses of data analytics software to analyze on the performance of a particular stock or fund in the stock market is very popular, especially in the world's financial centers like Hong Kong, London, New York and Tokyo.

In this project, you should **design a data analytics application** with various (**as least 5**) **technical indicators** available for the end users to choose. The medium of instructions is **English** to cater for both the Asian and global markets. In general, the **targeted end-users** fall in the **age range of 18+ years old**. In case you do not agree, you can specify your own targeted age range, say from 25 in your design. Besides, you may specify your targeted end users as the general users (i.e. anyone from the general public), financial analysts or fund house managers. **Depending on their specific user type**, you should clearly define their computer skills and domain knowledge. The data analytics application should be **easy-to-use** as according to the properties of the different age groups and the level / type of skills or knowledge the end user already acquired. After all, **sounds and colors** should be used whenever appropriate to attract the end user's attention. There is NO need to continuously download the real-time & online stock data for analyses. All the relevant stock data for analysis in the application can be pre-stored as some **offline data in a file**, such as a text, excel or database file, of the desktop computer or mobile device. The software tool should have **a carefully designed and easy-to-understand introduction**

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screen with several options (as menu items or check-buttons) to select and display the corresponding technical indicators. Charting facility (for plotting line-charts, bar-charts or pie-charts, etc.) is not strictly required yet it may be provided as some additional feature to enhance the data analysis. The detail of different parts of the software tools should be clearly explained via the online help facility. The prototype implementation of this project is completely up to the individual group. No extra bonus will be given to any networked software tool.

Below are some suggested links for reference on analytics software or technical indicators for computational finance – Pls. DO NOT copy your application from such or any other links:

https://en.wikipedia.org/wiki/Technical_indicator

<http://www.investopedia.com/terms/t/technicalindicator.asp>

http://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:bolinger_bands

<http://www.investopedia.com/articles/active-trading/121014/best-technical-analysis-trading-software.asp>

<https://www.metatrader4.com/en>

<http://www.ges.com.hk/en-us/>

----END OF Group project Specification-----