**ICS3U Final Project 15-16**

*LG: To demonstrate an understanding of all topics explored in the course this year in a large creative project. To apply key programming principles and explore the software development process using Python.*

***Overview of the Project***: You are to recreate a classic/retro video game or arcade game using Pygame. The program should include title screens, and should allow the user to interact with it by controlling a player character or object. You will need a scoring system for this program to keep track of points in the game. The goal of this program is that you demonstrate an application of all of the key commands used in the course in an efficient and effective manner.

Some examples of classic arcade games are : PacMan, Space Invaders, Frogger

For more examples see the list put out by Ranker: [The Best Classic Arcade Games](http://www.ranker.com/crowdranked-list/the-best-classic-arcade-games?format=GRID&page=1&action=tab&type=demographics)

***Expectations:***

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| Able to write programs that make use of input and output in both a graphical and console manner. | *A2.1, A2.2* |
| Able to write programs that make use of loops, decision structures and lists to enhance functionality | *A1, A2*  *A1.3, A1.4, A1.6* |
| Able to implement functions in your programs by using parameters and return statements. Extends use of functions to include graphical based commands. | *A3*  *A3.1, A3.2*  *B2.3* |
| Able to maintain code by debugging, providing functional comments, headers, descriptive comments. Able to interpret error messages and use techniques to validate portions of a program. | *A3, A4*  *A4.1, A4.2, A4.3, A4.4, A4.5* |
| Solve problems using strategies, focused on critical thinking in problem solving when programming implementations. | *B1, B3*  *B1.1, B1.2, B1.3*  *B3,1, B3.2, B3.3* |
| Able to properly plan out the ideas of a program using a flowchart, ASANA, and graphical sketching of the window/screen. Accounts for user requirements in the program alongside any simulated gameplay. | *B2*  *B2.1, B2.2, B2.3, B2.4* |
| Applies elements of the software development life cycle to help improve overall program performance including ASANA, and Test plans to help properly improve overall design. This also involves the creation of a User Guide which includes descriptions of all elements of the program. | *B4*  *B4.1, B4.2, B4.3, B4.4, B4.5, B4.6* |

***Topics from the Year*:** Your program needs to include an application of many of the key ideas that we explored in the course. In particular, you need to ensure that you apply key programming aspects from the course:

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| **Python Basics** | **Loops and Ifs** | **Functions and Lists** | **Graphics/Pygame** |
| Debugging  Input/Output  Variables  Formulas/Typecasting  Program Planning | Strings, Ifs, For Loops, While Loops, Nested Ifs, Nested Loops, Planning: ASANA and diagrams | Lists, Dictionaries, Simple Functions, Functions with Parameters, Functions that Return, Tuples | Drawing Shapes, Functional Drawings, Conditional and Loop Drawings, Animation, Keyboard Control, Adding/Moving Pictures |
| **Topics needed on the final project** | Functions  Lists  Loops  If Statements | | |

***Program Planning***: Spend some time thinking about TWO or THREE different game options that you would like to recreate for this project. Discuss your choices with Mr. Cardinale before you begin the planning process.

You will need to outline your program by planning it in great detail before you begin the programming process. You will need to create

1) Flowchart - this is a visual representation of the flow/parts of the program to map out all of the key ideas that you need to tackle. It is important that you are able to understand and group different tasks to help you determine where functions will be used.

2) Visual Sketch of the program to scale (using grid paper) – here you need to sketch a visual layout of your program using graph paper. You need to include key dimensions of the image so that you can use it as a reference when creating your program.

3) ASANA – you will need to map out your ideas in ASANA by including programming tasks and assigning key dates and to you. Be sure to create this page in away that it is shared with Mr. Cardinale (check with him). You will also summarize where you are planning on using Ifs/Loops, Functions and Lists and any additional features that you will be including with your program. ***You will be expected to continue updating ASANA throughout the course of the project indicating any changes to technique or process used in program.***

***Program Documentation*:** You will be expected to ensure that your programs are well document with comments/headers as necessary.

You will also need to create a **USER GUIDE** for the program that will include the following information in a visually appealing format.

* Name
* Program Description (characters, story, goals, appearance)
* Programs Controls Used (any special keyboard commands)
* How will the score be printed or results?
* Description of how you have applied key programming concepts (ifs, loops, functions, lists, etc…)
* References for any images that you have used in the program (background, character, etc..)
* Planning documents (flow chart and visual sketch)
* Test plan – you will create a short and succinct test plan that will dictate how you tried to crash your program in FIVE different ways. The test plan should be setup with the headings of: Code, Expected, and Actual. You can include screenshots to help you summarize this information if needed.

**Final Project Submission:**

* You will print off and submit a hard copy of your User Guide document.
* You will submit a ZIP file named FinalProject\_(YOUR NAME) that will contain the following:
  + All programming files and image files named appropriately
  + Report file that will contain aspects for both programming parts (summarized in description on previous page)

**Timeline/Key Dates:**

* Deadline # 1: April 26th  - Chosen your game for your project by the end of the class. Start working on planning parts #1-3.
* Deadline # 2: April 28th – Planning done for program (sketch, flowchart, ASANA)
* Deadline # 3: May 18th - Programming finished for most of program, peer evaluation day have someone else view/play your program.
* Deadline # 4: May 20th – Report day! Students will work on creating their report that they will submit with their programming project.
* **Project Due Date: Wednesday May 25th, (at the beginning of class)**

**Final Project Checklist:**

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| **Planning:** |
| * Brainstorm three different game ideas that you can work on for this project. * Discuss with Mr. Cardinale your options and decide on a game. * Sketch a Flowchart that describes the progression of the game (start to end) * Sketch a visual representation of what the game will look like. Make sure this diagram is to scale. * Summarize where you are using loops, ifs, functions, lists and other programming structures from the course. You can do this on your flowchart. * Update ASANA with a listing of tasks for this project, be sure to assign deadlines/dates. |
| **Programming:** |
| * Have you updated ASANA with written comments/feedback as you complete the different parts of the assignment? * Are you actively working on the project both in and out of class? |
| **Documentation:** |
| * Have you included comments to describe key sections of your code? * Have you included a header for your program with all required aspects? Have you included function headers that describe the purpose and listing of parameters and return types in your functions? * Have you written your user guide that includes all required aspects (see list in planning description)? |
| **Project Submission:** |
| * Have you compressed/zipped all of your programming files image files and documents into one folder? Named it appropriately? * Have you uploaded them to Veracross dropbox and confirmed that Mr. C has them? * Have you printed a copy of the User Guide and submitted it to Mr. C? |