IT2100 Programming Logic

Capstone Project

This project will become part of your portfolio.

This is your capstone project. It becomes as part of your portfolio to demonstrate what you have learned to future employers or graduate schools. Your graded capstone project submission will be appended to this project assignment and saved as part of your permanent portfolio.

Place the paragraph on the next page at the top of your submission:

IT 2100, Programming Logic, is a second semester freshman year course.

COURSE DESCRIPTION:

This is the first course in a three course programming sequence. This course introduces programming concepts in a programming language agnostic environment. It includes basic algorithm design and development including the three basic programming structures; sequence, decision, and repetition. It further includes basic encapsulation.

To successfully complete this course, students must be capable of analyzing a problem and employing the programming structures towards implementing an intuitive solution to that problem.

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Capstone Project

For this project, you will design and implement a series of tasks for your Scribbler robot (https://www.parallax.com/product/28333). For each portion of this project,

1. You must prepare a statement of requirements.
2. Your program is your design. You must preserve your original program so you can demonstrate how you developed a complete solution.
3. You should identify and document the shortcomings in your original design (if any).
4. You must produce a final design showing the final program you implemented.
5. You must produce a video, with audio, demonstrating how your robot completes this challenge.
6. You must upload your final Capstone to GitHub and Blackboard

Your design must employ sequence, decision, loops, and sub-programs (encapsulation) as appropriate to create an efficient and understandable (to another programmer) solution.

This project must be submitted in a single zipped folder.

Exercise 1 — Traverse A Maze

A. The Exercise
   1. Associated with this document is a maze. Create this maze using anything you have handy (you could even draw it) – it is not to scale. You may create it in pieces.
   2. Develop a program that causes your Scribbler to traverse this maze.
      a. Follow any rules shown on the maze.
      b. Be sure you use proper programming, including sequence, decisions, loops, and subs.
   3. Document any issues your initial program has in successfully traversing the maze.
   4. Modify your program to its final form.
   5. You may not create a line that traverses your maze and have the Scribbler follow that line.
   6. Deliverables:
      a. A statement of the Requirements for this portion named **yourLastName.Requirements.E1.docx**
      b. Your initial program named **yourLastName.Capstone.E1.1.scb**
      c. Your final program named **yourLastName.Capstone.E1.2.scb**
      d. Your observations named **yourLastName.capstone.E1.docx**

Exercise 2 — Adding Lights

A. The Exercise
   1. Copy your program from **Exercise 1** – rename the copy **yourLastName.cpastone.E2**
      a. Modify only **yourLastName.capstone.E2** for this part.
   2. For Exercise 2, modify your program so:
      a. When Scribbler turns right, light only the right LED
      b. When Scribbler turns left, light only the left LED
      c. When Scribbler is going straight, light only the center LED
   3. This time, as Scribbler completes each piece of the maze, play a song of triumph.
   4. Upon completion, design and implement a completion dance that includes motion, lights, and sound.
   5. Deliverables:
      a. A statement of the Requirements for this portion named **yourLastName.Requirements.E2.docx**
      b. Your initial program named **yourLastName.Capstone.E2.1.scb**
      c. Your final program named **yourLastName.Capstone.E2.2.scb**
      d. Your observations named **yourLastName.capstone.E2.docx**

Exercise 3 — Submitting Your Video

1. A video of your Scribbler traversing your maze that shows the LEDs turning on and off and allows a listener to hear sounds emanating from Scribbler.

Exercise 4 — Uploading Programs and Video to GitHub

A. The Exercise
   1. Upload all nine deliverables to your GitHub repository. Make it publicly available.
   2. Deliverables:
      a. Your GitHub repository URL

Exercise 5 — Uploading Programs and Video to Blackboard

A. The Exercise
   1. Place all nine deliverables in a single folder.
   2. Rename that folder **yourLastName.Capstone**
   3. Zip that folder
   4. Deliverables:
      a. Upload that zipped folder to Blackboard

Grading Criteria:

Exercise 1

requirements	initial design	design shortcomings	final design	proper sequence	proper decisions	proper loops	proper subprograms	completes maze	total
10	10	10	10	10	10	10	15	15	100

Exercise 2

requirements	initial design	design shortcomings	final design	proper subprograms	completes properly	total
10	5	5	5	15	10	50

Exercise 3	Exercise 4	Exercise 5
Video	HitHub	Blackboard
50	50	50

There will be significant penalties for not following directions!

Exercises not named properly	folder not named properly	zipped folder not named properly	did not follow directions
each	each	each	up to
-5	-5	-5	-10