Gymea Technology High School
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8 Technology A

Task 1: Design Project Stage 1

Due Date: 29 Aug 2024

Distributed: 1 Aug 2024

Weighting: 30%

Task Type: Designs & Quiz

Syllabus Outcome/s: TE4-1DP, TE4-2DP, TE4-4DP

Unit: Robotic Design

Task Description

Learning to program and develop algorithms is essential if you're wanting to use computerised solutions to solve problems, such as using robots and machines.

PART A - Algorithm Planning

Using Flowcharts, you need to design algorithms to control a small robot (mBot) to solve the following problem:

- Navigate a predetermined course avoiding obstacles using both a line and ultrasonic sensor.

Using Pseudocode, design some algorithms to control a mechatronic robot, called SEVN, to solve the following problem:

- Collect a parcel from your front door and deliver it to a predetermined room within the house.

PART B - Quiz

An in-class quiz on

- computational thinking
- algorithm design and representation
- data representation
- beginner Python skills such as input, output, loops, IF statements, conditionals and variables

As part of your preparation for this quiz, you should ensure you've completed all Formative Tasks for this class, as well as having completed up to and include Week 5 of the NCSS Challenge.

Glossary of Key Words

These verbs will provide an understanding of the detail needed to successfully complete this task:

- **Apply:** Use, utilise, employ in a particular situation
- **Demonstrate:** Show by example
- **Describe:** Provide characteristics and features
- **Justify:** Support an argument or conclusion
- **Outline:** Sketch in general terms; indicate the main features of

Details of Submission

PART A - Algorithm Planning -
Submit your completed Algorithm Planning on the due date list above.

PART B - Quiz -
You will complete this quiz in class on the due date listed above. The quiz must be completed in one sitting.

Teacher Feedback and Student Self-Reflection

The task will be returned to students within **14 days** of the due date. Information on how to improve will be provided through written teacher feedback and the marking criteria. Students can clarify or seek further feedback by speaking with their teacher.

Upon return of the task and teacher feedback, students will also be expected to complete the following self-reflection form, to provide them with the opportunity to reflect on the strength of their performance, as well as areas that have been identified to strengthen in future tasks - https://forms.gle/Y9GaD7kxfnrrdHLg6

How does this link to my learning?

This task will allow students to:

- Demonstrates knowledge and skills in using a text-based programming language (Python) to solve problems and design digital solutions
- Ability to communicate their algorithmic solutions through text and visual communication methods

Assessment Procedures

Students should be fully aware of the School Assessment Procedures for their year group. These were provided at the beginning of the school year and are available off the school website under the Learning menu for each year group.

Marking Criteria

Part A - Algorithmic Planning - 50%

Criteria	1	2	3	4	5
Algorithm design with Flowcharts	Limited attempt made at completing a flowchart. Limited logic or problem solving skills shown. Algorithm presented does not solve the stated problem.	Flowchart uses variables or loops. Basic attempt at logical sequencing provided. Limited use of correct flowchart symbols evident. Attempts to solve a limited number of components of the problem.	Flowchart uses loops and/or variables, with satisfactory attempts at logical sequencing evident. Some correct use of flowchart symbols is evident and solves some components of the problem.	Flowchart uses loops, variable and logical sequencing of steps. Mostly correct use of flowchart symbols evident. Solves most of the components of the problem stated.	Flowchart uses loops, appropriate variable names, logical sequencing of steps and functions where appropriate. Correct use of all flowchart symbols evident. Solves the problem stated.
Algorithm design with Pseudocode	Limited attempt made at completing a pseudocode design. Limited logic or problem solving skills shown. Algorithm presented does not solve the stated problem.	Pseudocode uses variables or loops. Basic attempt at logical sequencing provided. Limited use of correct pseudocode syntax evident. Attempts to solve a limited number of components of the problem.	Pseudocode uses loops and/or variables, with satisfactory attempts at logical sequencing evident. Some correct pseudocode syntax is evident and solves some components of the problem.	Pseudocode uses loops, variables, and logical sequencing of steps. Correct use of pseudocode syntax evident. Solves most of the components of the problem stated.	Pseudocode uses loops, appropriate variable names, logical sequencing of steps and functions where appropriate. Correct use of pseudocode syntax evident. Solves the problem stated.

Part B - Quiz - 50%

Marks will be shown on the quiz for each question provided.