Gymea Technology High School
INSPIRE. LEARN. SUCCEED.

9 Computing Technology

Task 5: Robomaster

Due Date: 19 Nov 2024

Distributed: 29 Oct 2024

Weighting: 30%

Task Type: Group Project

Syllabus Outcome/s: CT5-DPM-01, CT5-COL-01, CT5-OPL-01, CT5-THI-01

Unit: Building Mechatronic Automated Systems

Task Description

In groups of 3, you will need to design and implement an algorithm for the Robomaster EP to complete one of the following tasks (as assigned by your teacher):

- **The Collector**: This robot will need to locate and collect items, transporting them to a marked dropoff location.
- **The Courier**: This robot will need to navigate a course by following a line and deliver the items from the dropoff location to the destination location.
- **The Customer:** This robot will need to collect the item that has been delivered by The Courier and transport it to its final destination.

Part A - Group Folio
The folio should contain the following:

1. **Design:**
   a. **Introduction:** Outline the problem definition and each group members' role(s).
   b. **Content:** Describe the functional and nonfunctional requirements of the mechatronic system.
2. **Journal:** A journal of the development of the project solution that accurately illustrates the process of completing the task. It should clearly show modifications made to the code, problems and solutions encountered.
3. **Test Data (Desk Check):** Your group will need to thoroughly test the algorithm developed using a range of test data. It should clearly demonstrate errors or bugs found in the algorithm.
4. **Evaluation:** An evaluation of the project which involves discussing the areas of success and improvement of your robot in the project.

Part B - Practical

1. **Code -** Your group will need to include code for your Robomaster
2. **Video** - Your group will need to film, using the school's iPads, the Robomaster EPs completing the required task as outlined above.

Glossary of Key Words

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

- **Describe:** Provide characteristics and features
- **Evaluate:** Make a judgement based on criteria; determine the value of

Details of Submission

PART A - Group Folio
Submit the scaffold as provided on Google Classroom.

PART B - Practical
Upload the video of your group's Robomaster in action, along with a copy of your code.

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/Ck4y1jid49x7sKfq7

How does this link to my learning?

This task will allow students to:

- Enhanced Understanding: Deepen their comprehension of the subject matter by applying it practically.
- Skill Development: Improve critical thinking, analytical, and problem-solving skills.
- Practical Application: Gain experience in applying classroom theories to real-world contexts.
- Collaboration: Develop teamwork and communication skills if the task involves group work.
- Self-Assessment: Reflect on their learning process and identify areas for improvement.

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 - Group Folio					
Criteria	**1**	**2**	**3**	**4**	**5**
Design	Identifies ONE design requirement to complete the scenario.	Provides an outline of the design requirements (functional or nonfunctional) for the mechatronic system to complete.	Satisfactorily describes the design requirements (functional and/or nonfunctional) of the scenario for the mechatronic system to complete.	Thoroughly clarifies the design requirements (both functional and nonfunctional) of the scenario for the mechatronic system to complete.	Extensively clarifies the design requirements (both functional and nonfunctional) of the scenario for the mechatronic system to complete.
Journal	Students incorrectly record the journey of completing and modelling a system. The record is limited and incomplete and is presented inappropriately.	Students provide a basic record of project development that inaccurately illustrates the journey of completing the system. The record contains incomplete lesson by lesson accounts of work completed.	The record contains lesson by lesson accounts of work completed which includes, discussions, evaluations, images and milestones precisely timestamped and is presented appropriately.	The record contains detailed lesson by lesson accounts of work completed which includes, discussions, evaluations, images and milestones precisely timestamped and is presented in a professional manner.	The record contains detailed and accurate lesson by lesson accounts of work completed which includes, discussions, evaluations, images and milestones precisely timestamped and is presented in a professional manner.
Test Data	Test data is incomplete and/or lists some test cases.	Test criteria for components of the mechatronic system have been identified.	Test criteria for components of the mechatronic system are outlined.	Descriptive test criteria for components of the mechatronic system is used.	There are extensive test criteria for components of the mechatronic system.
Evaluation	Evaluation is incomplete and/or lists some areas of success or for improvement	Evaluation identifies some areas of success and/or areas for improvement	Evaluation outlines areas of success and areas for improvement based on predetermined functional and non-functional requirements	Evaluation describes areas of success and areas for improvement based on predetermined functional and non-functional requirements	Evaluation is detailed, objective and explains areas of success and improvement based on predetermined functional and non-functional requirements
					Part A TOTAL / 20

PART B - Practical					
Criteria	**1**	**2**	**3**	**4**	**5**
Code	Demonstrates an elementary understanding of programming logic and programming language syntax.	Demonstrates some understanding of programming logic and programming language syntax to develop a somewhat effective solution.	Demonstrates understanding of programming logic and programming language syntax to develop a mostly effective and reliable solution.	Demonstrates a thorough understanding of programming logic and programming language syntax to develop a mostly effective, reliable and efficient solution.	Demonstrates an extensive understanding of programming logic and programming language syntax to develop a highly effective, reliable and efficient solution.
Problem Solving	Students coded solution show little logical structure with few examples of correct syntax and readable code, and does not fully solve components identified in the mechatronic system.	Students Python code shows some basic logical structure, using some correct syntax, includes some comments and solves some components identified in the mechatronic and/or automated system.	Students Python code follows a sound logical structure, using mostly correct syntax, has a sound level of readability and comments, and solves most components identified in the problem definition.	Students Python solution follows a logical structure and uses mostly correct syntax. Includes comments and an accurate algorithm that is largely free from errors. The solution addresses most components identified in the problem definition.	Students Python code shows excellent problem solving skills and is efficient, highly logical, uses correct syntax, and includes a reliable algorithm free from errors. The code will be highly readable and well-commented.
Film	Students provide an incomplete video that incorrectly illustrates the robot(s) completing the course and/or objectives.	Students provide an incomplete video that illustrates the robot(s) completing the course and objectives.	Students video illustrates the robots completing some of the objectives. The video is well made and presented. Video has been exported.	Students video that accurately demonstrates their robots completing the objectives. The video is professionally made and presented. Video exported in the correct format (.mp4).	Students video accurately demonstrates their robots completing the objectives. The video extensively and accurately illustrates the three robots navigating the course and completing their objective. The video exported as .mp4 and presented including use of titles.
					Part B TOTAL / 15
					OVERALL TOTAL / 35

Literacy Criteria

Literacy Outcomes	Elementary achievement You have:	Limited achievement You have:	Satisfactory achievement You have:	High achievement You have:	Outstanding achievement You have:
	0	0.25	0.5	0.75	1
Vocabulary *Uses technical vocabulary to explain concepts and/or range of precise and appropriate words for effect*	Very limited response. Few content words used.	Only simple words are used.	Some precise and technical words are used.	Sustained use of precise and technical words.	Sustained, consistent and fluent use of precise and technical words.
Punctuation *Use of correct and appropriate sentence and other punctuation for effect, and to aid in reading of the text*	No evidence of correct sentence punctuation.	Sentence punctuation is correctly used in at least one place - *one sentence is punctuated correctly.*	Some correct sentence level punctuation (at least 50%). May attempt other punctuation where it is required.	Mostly correct sentence level punctuation (80%) and at least two correct examples of other punctuation.	Writing contains accurate use of all applicable punctuation.
Sentences & Cohesion *The intentional construction of a variety of sentences to match purpose and audience, and the control of multiple sentence threads across the whole text.*	No clear evidence of sentences: a list of words OR text fragments.	At least one sentence is used correctly. Some meaning can be construed from the text.	Some correct formation of sentences. Mainly uses simple and compound sentences, but may attempt more complex structures.	Most sentences are correct. Range of sentence types and connectives are evident, but with varied effectiveness.	All sentences are correct, effective and controlled, and include a range of sentence types and connectives (complex sentences and other sophisticated structures)
Paragraphs *Paragraphs are used to effectively structure information and partition events and ideas*	No correct use of paragraphing; may be a block of text or random breaks.	Ideas are separated; paragraphs may contain some unrelated ideas.	At least ONE paragraph is well structured and develops an idea	Writing is organised into paragraphs that assist the reader to digest chunks of the text, but may not be linked or executed effectively.	All components of the paragraphs are evident and paragraphing is consistent and well-developed across the whole text.
Text Structure *Uses features of the appropriate text type*	No evidence of the structural features of the appropriate text type. *No attempt to write in the appropriate text type and/or response is off task.*	Minimal evidence of the structural features - *1 component evident* - of the appropriate text type.	Some evidence of the structural features - *2 components evident* - of the appropriate text type.	Substantial evidence of the structural features - *all components evident but there may be some lapses* - of the appropriate text type.	Coherent and controlled use of **all** the appropriate structural features of the text type.
	Level of response is well below syllabus expectation	Level of response is below syllabus expectation	Level of response is equivalent to syllabus expectation	Level of response is above syllabus expectation	Level of response is well above syllabus expectation

Literacy Total / 5