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| **CodeAIR Mission 6 Assignment** | **Name:** |
| **Pre-Mission Preparation** | |
| What are RANGERS, and what are they used for? |  |
| ***Avoidance***, the last program in Mission 5, could throw an exception. What was your ‘bugfix’? |  |
| **Mission 6 Checks – Navigate!** | |
| Objective #1  What is the flow sensor?  What can the flow sensor detect?  What are “deltas”?  What is the code for reading the flow sensor?  Give an example of a format string: |  |
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| Objective #2  How does altitude affect flow values?  How does the flight controller account for altitude? |  |
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| Objective #3  What does the flow sensor “see” during rotation? |  |
| Objective #4  What is the code for reading the battery voltage?  When can you assess the battery level?  What is the best way to know the true battery level? |  |
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| Objective #5  What is a byte?  What is the code for using binary to turn on LEDs? |  |
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| The 8 blue LEDs can display an integer value between 0 and 255. Practice your binary skills by converting the binary to decimal and decimal to binary:   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Binary number | Decimal number |  | Decimal number | Binary number | | 00000010 |  |  | 3 |  | | 00000100 |  |  | 10 |  | | 00000110 |  |  | 15 |  | | 00010001 |  |  | 33 |  | | 00100000 |  |  | 64 |  | | |
| Objective #6  What are exceptions in programming?  What exception happens when you run the code for this Objective? |  |
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| Objective #7  Does CodeAIR use an external positioning system? Why or why not?  What code is used to handle exceptions?  Why do the pixel LEDs turn pink? |  |
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| **Log the Data:** Make notes with each test flight. You can use the chart on the next page, use the spreadsheet, or come up with your own note-taking system. You can add more routes. You can also change the velocity. Use the data to answer the reflection questions. | |
| **Post-Mission Reflection:** During the Objective you were presented with three questions:   * How accurately can you move a particular distance using flow sensor data? * Is flow-sensor accuracy dependent on altitude? * Would a slower velocity help or hurt? | |
| Reflect on the data and write a response: | |
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| **Mission 6 Navigate – Flight Data** Name: | | | | | |
| Make notes with each test flight. ***Run each route multiple times.*** Add more routes to expand the data set.   * How much does the distance vary between runs? * What is the average distance? | | | | | |
| Route | Velocity | Height | Route distance | Measured distance | Describe conditions |
| 1 | 0.2m | 0.3m | 1.0m |  |  |
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