**Tutorial 1B**

Scratch exercises given the plan and test data for sequential programs

Document your process of code/test/debug as you develop versions of the code.

**Question 1**

Using interactive code for the input of data, allow the user to enter the length and width of a rectangle.

Calculate and display:

1. The perimeter of the rectangle
2. The area of the rectangle

**Input**

|  |  |  |
| --- | --- | --- |
| *variableName* | *type* | *availability* |
| length | float | keyboard |
| width | float | keyboard |

**Output**

|  |  |  |
| --- | --- | --- |
| *variableName* | *format* | *where* |
| perimeter | 2 dp | Screen(stage with sprite) |
| area | 2 dp | Screen (stage with sprite) |

**Processing**

Perimeter 🡨 2 \* length + 2 \* width

Area 🡨 length \* width

**TestData**

|  |  |  |  |
| --- | --- | --- | --- |
| *length* | *width* | *perimeter* | *area* |
| 10 | 7.5 | 35 | 75 |
| 69.5 | 34.8 | 208.6 | 24186 |

**Pseudocode**

Enter the data

Process the data - calculations

Display the results

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**Question 2**

Using interactive code for the input of data, allow the user to enter the number of items in a box and the total price paid for the box.

Calculate and display the price of one item.

**Input**

|  |  |  |
| --- | --- | --- |
| *variableName* | *type* | *availability* |
| number | integer | keyboard |
| totalPrice | float | keyboard |

**Output**

|  |  |  |
| --- | --- | --- |
| *variableName* | *format* | *where* |
| priceOneItem | 2 dp | Screen(stage with sprite) |

**Processing**

priceOneItem 🡨 totalPrice / number

**TestData**

|  |  |  |
| --- | --- | --- |
| *number* | *totalPrice* | *priceOneItem* |
| 10 | 17.50 | 1.75 |
| 50 | 32.50 | 0.65 |
| 25 | 450 | 18.00 |

**Pseudocode**

Enter the data

Process the data - calculations

Display the results

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**Question 3**

Using interactive code for the input of data, allow the user to enter the three sides of a triangle.

Calculate and display the perimeter of the triangle

**Input**

|  |  |  |
| --- | --- | --- |
| *variableName* | *type* | *availability* |
| side1 | float | keyboard |
| side2 | keyboard |
| side3 | keyboard |

**Output**

|  |  |  |
| --- | --- | --- |
| *variableName* | *format* | *where* |
| perimeter | 2 dp | Screen(stage with sprite) |

**Processing**

perimeter 🡨 side1 + side2 + side3

**TestData**

|  |  |  |  |
| --- | --- | --- | --- |
| *side1* | *side2* | *side3* | *perimeter* |
| 10 | 17.50 | 12.75 | 40.25 |
| 50 | 32.50 | 40.65 | 123.15 |
| 35 | 45 | 18 | 98 |

**Pseudocode**

Enter the data

Process the data - calculations

Display the results

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**Question 4**

Using interactive code for the input of data, allow the user to enter the heights of three students.

Determine and display the average height

**Input**

|  |  |  |
| --- | --- | --- |
| *variableName* | *type* | *availability* |
| height1 | float | keyboard |
| height2 | keyboard |
| height3 | keyboard |

**Output**

|  |  |  |
| --- | --- | --- |
| *variableName* | *format* | *where* |
| average | 2 dp | Screen(stage with sprite) |

**Processing**

sum 🡨 height1 + height2 + height3

average 🡨 sum / 3

**TestData**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *height1* | *height2* | *height3* | *sum* | *average* |
| 132 | 175 | 127.5 | 434.5 | 144.8 |
| 85 | 69.2 | 91 | 245.2 | 81.73 |
| 156 | 180 | 198 | 534 | 178 |

**Pseudocode**

Enter the data

Process the data - calculations

Display the results

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***Extension for fast workers - heading for Merit and Excellence***

**Question 5**

Code the next version for question 1 and add in

c) calculate and display the diagonal of a rectangle

**TestData**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *length* | *width* | *perimeter* | *area* | *diagonal* |
| 10 | 7.5 | 35 | 75 | 12.5 |
| 69.5 | 34.8 | 208.6 | 24186 | 77.73 |

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**Question 6**

Code the next version for question 3 and calculate the area of the triangle using the formula

Area =  where s = half the perimeter

**TestData**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *side1* | *side2* | *side3* | *perimeter* | *area* |
| 10 | 17.50 | 12.75 | 40.25 | 62.80744 |
| 50 | 32.50 | 40.65 | 123.15 | 658.4993 |
| 35 | 45 | 18 | 98 | 291.6573 |

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