



## Assignment 1 Guide

### Half-term Coursework

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The following tasks need to be completed over the half-term week.

- **Task g** - List the data to be input, output and stored
  - **Task h** - List the main stages in processing of data from input of data to output of results
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### Task g - List the data to be input, output and stored

You should already have thought about the inputs, outputs and stored data from working through **tasks c** and **d**. If so, you should examine the notes and work you did for those tasks as this will help you with the current tasks.

To refresh your memory..

All programs need to take **input** from the user or from some other source such as another system or computer. A program usually produces **output** of some sort.

#### Inputs:

Inputs are information needed by your program before it can carry out any processes. You can figure out what inputs are needed by thinking about all the calculations your program needs to perform.

*For example* – one calculation the program needs to perform is...

$$\text{Area of lawn1} = \text{length of lawn1} * \text{width of lawn1}$$

Before it can carry out that calculation, it needs two inputs from the user, the length of lawn1 and width of lawn1.

*Here is another example:-*

$$\text{Amount of lawn seed} = \text{area of lawn1} * \text{amount that covers 1 square meter}$$

In this second example, the program has already calculated the **area of lawn1**, so it does not need the user to input that. However, the program does need to know the **amount of lawn seed that covers 1 square meter**. So you could list this as an input.

*Here is one other example:*

$$\text{Number of bags of lawn seed} = \text{amount of lawn seed} / \text{amount in a bag}$$

The program can calculate the **amount of lawn seed** using the previous example, but it will not know the **amount in a bag** unless we give it this information. So this could be an input too.

So far then, the inputs are:-

- length of lawn1 (m)
- width of lawn1 (m)
- amount of lawn seed that covers 1 square meter (grams)
- amount of lawn seed in a bag (number)

Now you need to finish this list yourself by considering the other lawn and field shape calculations. Then list the inputs needed for calculating the areas, amount of seeds and number of bags of seed for each of those shapes.

### Outputs

The outputs of your program are related to the things the user wants to know, the end results. Remember, the clients wants the program to do the following...

*"The program must calculate how much of each seed type should be sown, and how many whole bags of each seed must be purchased."*

- amount of lawn seeds in grams
- number of bags of lawn seed

There are at least two more outputs, what are they?

### Stored Data

Stored data is data that could be stored by your program, so the user does not have to type it in. The type of data you would store is information that doesn't change very often.

*Example:*

Do you think the number of grams of seed needed to cover one square meter will change every time a user runs your program? Do you think a user would prefer it if your program could store values that rarely change, so that value does not have to be typed in all the time?

Perhaps your program could store the values such as **number of grams of seed needed to cover one square meter** and **the number of grams in a bag** for each seed type. Then the user wouldn't have to keep typing these values in every time they use your program.

The value for **number of grams of lawn seed needed to cover one square meter** is **30 grams**. What would happen if the value changed though, say because the manufacturer changed the seed type. Say it changed to **40 grams**. Then your program would give the wrong answers. You could always add a stored data form to your program to allow the user to change the values of any stored data to new values. Then the program would still output the correct answers even if the stored data values changed.

So, here are two stored data items

- number of grams of lawn seed needed to cover one square meter
- number of grams of lawn seed in a bag

What other stored data could you have in your program?

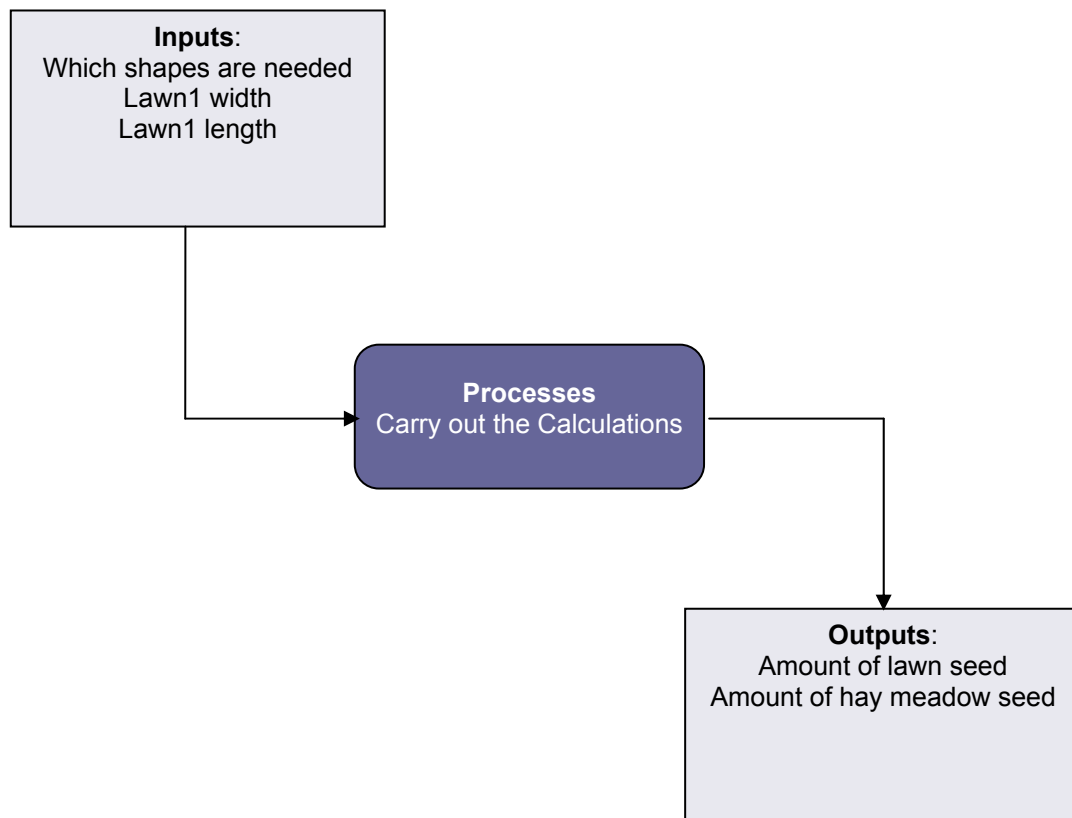
**Task h - List the main stages in processing of data from input of data to output of results**

In this task you need to draw two diagrams.

- A general diagram like **Diagram 1**
- A more detailed diagram like **Diagram 2** or **Diagram 3**

Diagram 1 below shows the overall processing of data from inputs to outputs.

The diagram is not complete. You need to draw something similar and make sure **all** the inputs and outputs are included in the relevant boxes.

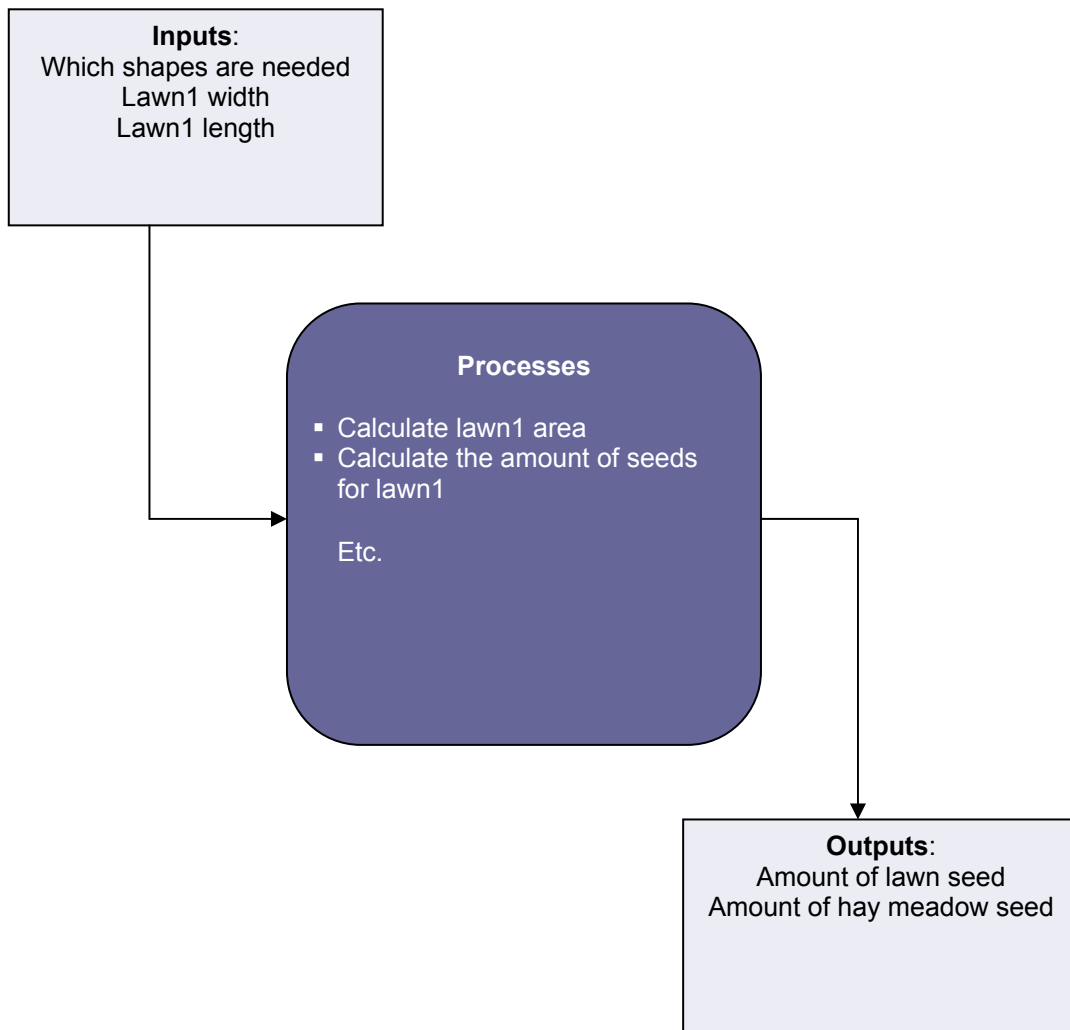


**Diagram 1**

Although this diagram gives a general overview of structure of a program from inputs to processing to outputs, the processes box is not quite detailed enough though. It does not list all the **main stages of processing**. Remember, for this seed calculation program, the processes are mainly the calculations.

A more detailed diagram could be produced.

Here is one way of producing a better diagram with more details on the main stages in the processing of the data.



**Diagram 2**

Again, I have not finished this diagram. I have not listed in all inputs, outputs or the calculations in the processes box. Which calculations have I left out?

Even though I have not finished this diagram, you can see already that the diagram would show the processes in more detail than the first diagram. All the calculations listed in the processes box would have to be listed in the correct order.

Another way of showing more details about the processes would be to draw a diagram similar to this:-

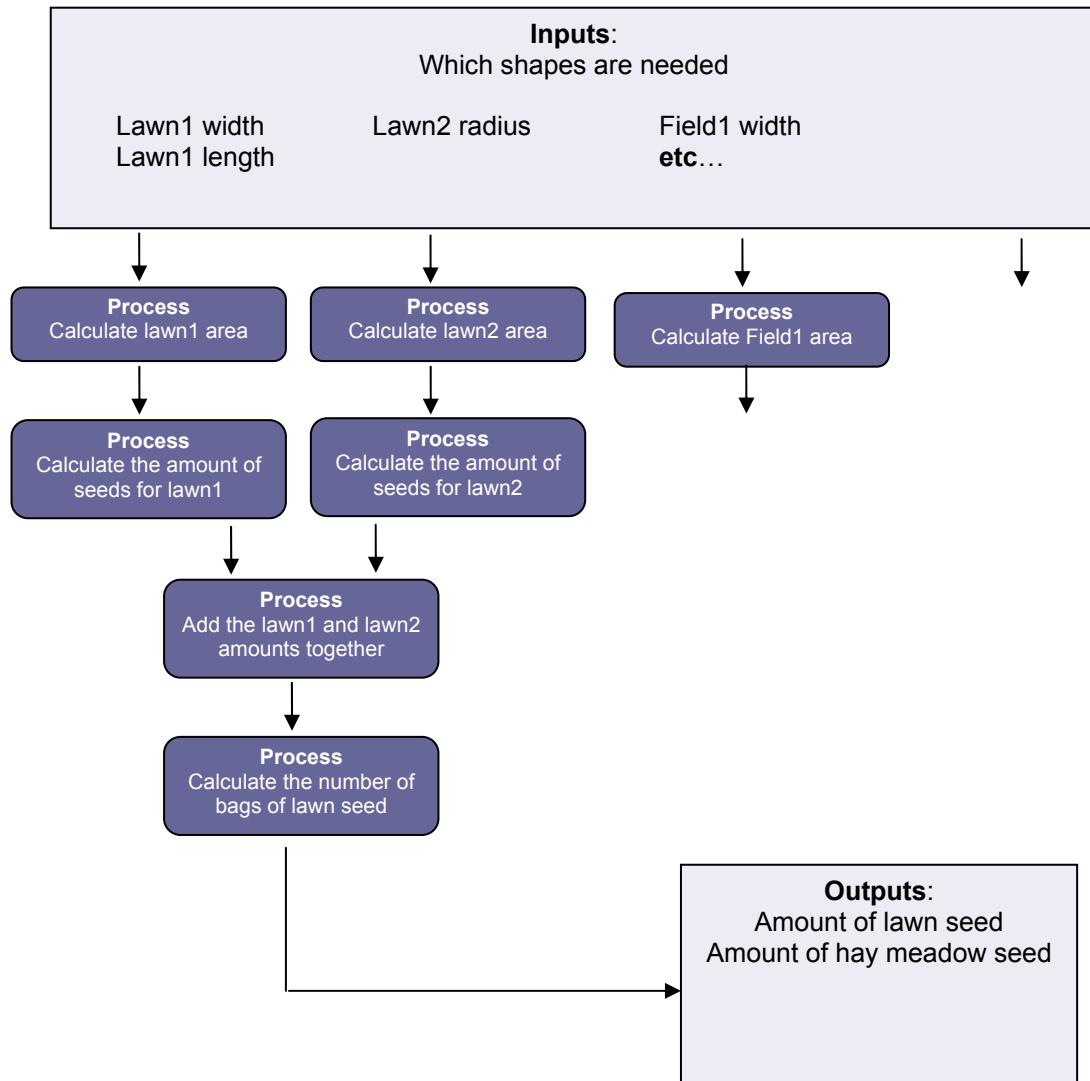


Diagram 3

This diagram is also unfinished. Which inputs, outputs and calculations have I left out?

Even though the diagram is unfinished, you can probably see already that it is the most detailed diagram of them all. It also has the advantage of showing all the processes in the correct order and shows which calculations must be done first.

Now it's your turn draw a diagram with the processes shown in more detail. Either finish **Diagram 2** or **Diagram 3**. Or you could think up a diagram of your own.