

# Sprint 3

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In sprint 3, you will be developing extended functionalities for the game.

1. Save and load
2. A second currency
3. Upgrading the Automatic Pencil Manufacturer
4. Marketing
5. Debugging tools

Like the previous sprint, you are expected to implement unit testing for any suitable new features that you add.

The UI elements should be added at your own discretion. Feel free to expand the program's visual space or make other elements smaller to accommodate this.

## Save and Load

For the save and load function, you should be able to save the current state of your game (e.g. materials left, money, pencils sold, and so on) to a simple `.sav` file. It is up to you to how to implement the `.sav` file.

## A Second Currency

There needs to be a second currency to allow for more diversified gameplay. The second currency's primary function is to unlock new elements to the gameplay other than the traditional buying and selling of materials, pencils and the APMs. The conditions for the second currency are as follows:

1. The currency is called `Intelligence`
2. `Intelligence` is generated at a rate of 1 per second when the number of pencils **manufactured** reaches 3000, and remains so.
3. The current max capacity of `Intelligence` should be set at 200.
4. A new UI element that shows your current `Intelligence` should pop up once `Intelligence` begins to be generated. The element should be hidden before that happens.

You will be tasked to implement functions that enable you to increase the generation rate and the max capacity in the next sprint.

## Upgrading the Automatic Pencil Manufacturer

1. This upgrade should increase the rate of pencil production of the APM by 10% each time it is purchased.
2. The upgrade will be purchasable with `Intelligence`.
3. The upgrade is only available twice in the current version: once when `Intelligence` unlocks for **50** `Intelligence`, and second time when the number of pencils manufactured reaches **5000**, for **200** `Intelligence`.

## Marketing

Marketing is a mechanic used to inflate the demand for the pencils. To do this, you will need an updated equation for calculating the sales rate of the pencil:

$$rate = \frac{1}{priceOfPencil} * (1.1^M)$$

1. Marketing unlocks when `Intelligence` does, and can be purchased for **100** `Intelligence`. This does **not** increase `M` to 1.
2. Marketing can be upgraded with **normal money** to increase the value of `M` in the equation by 1. The price starts at **\$500**, and increases by **10%** multiplicatively.
3. When marketing is unlocked, a new UI element should appear (a button to upgrade Marketing) under the `Bank Balance` UI element.

## Debugging Tool

Now that some of the elements in the game can only become available after playing it for some time, it would be wise to develop a tool that allow you to speed up the process if you want to test the new game functions. Debugging tool should allow you to:

1. Grant the player \$1000
2. Increase the number of pencils in inventory by 1000
3. Increase the number of pencils manufactured by 1000
4. Grant the player 10m of wood and granite

Also, the debugging tool should not always be visible. Create a checkbox that, when ticked, shows the debugging tool, and hides it when unticked.

The debugging tool should eventually be removed for the final (release) version.