

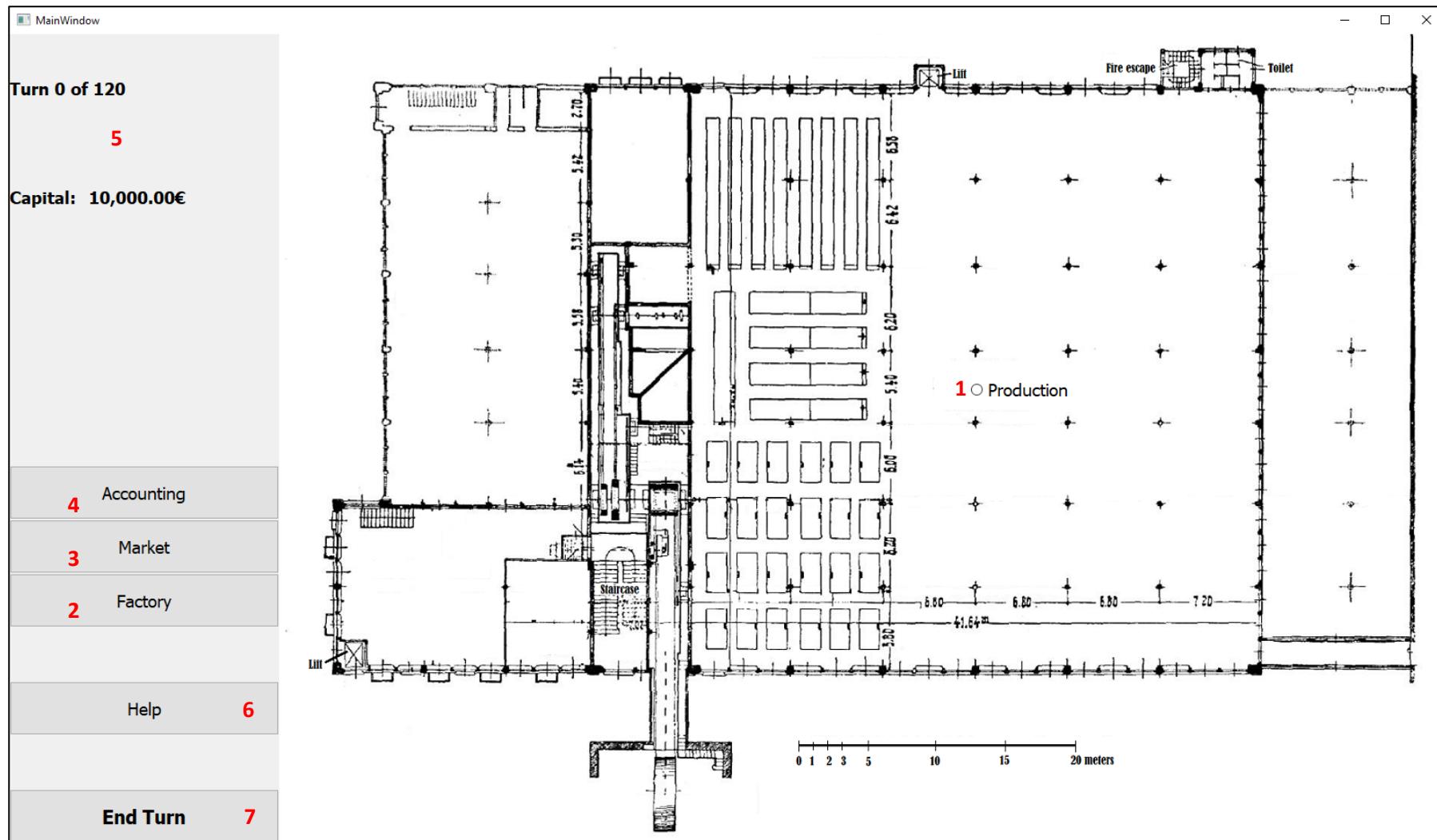
Illumination Game

Game Manual

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1. General



Picture 1: Main Game Window

1. **Production**

Opens the product and production window. You find any information about your products and stock. You can set production goals here.

2. **Factory**

Opens the factory and layout window. You find the basic information about your factory and production layouts. You build and change your factory and production layouts here.

3. **Market**

Opens the market window. You find information about the light market here. You can adjust the sales price here.

4. **Accounting**

Opens the accounting window. You find all information about income and profit here. It is your balance sheet and archive.

5. **Funds and Turn**

In the top left corner you can see the current turn and your current funds.

6. **Help**

Pressing this button opens this game manual.

7. **End Turn**

This button ends the current turn and starts the next.

Numerous elements will display **tool tips** if you hover the mouse above it. As an additional help during the first twelve rounds of the game you get tutorial like instruction at the beginning of each turn.

1.1 Start

You start with 10,000€ in funds and two fixed position layouts that can produce 2,285 units per turn. You produce standard light bulbs and have 1,000 light bulbs in stock. There are also enough raw materials to produce another 1,000 light bulbs.

Good enough to begin with!

1.2 Objective

Your goal is nothing less market domination in the illuminate's market! The local authorities define market domination as 30% of the entire market volume.

In order to achieve that ambitious goal, you first need to expand your production. 2,285 units per month are nice enough for a craftsman, but you are a tycoon! To produce more, you need to build more and better production layouts. They are what primarily increases your production capacity. From time to time you will also find that your factory has become too small and you must expand it as well.

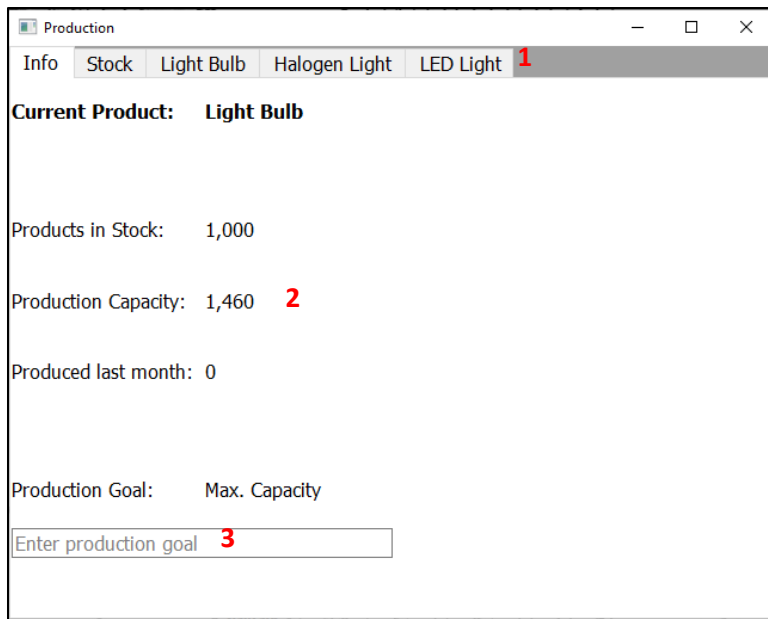
Last but not least, all the production is useless, if you can't sell it! Your sales team does an amazing and entirely accurate¹ job in creating sales forecasts for you. They provide orientation in what you can expect to sell, so you can adjust your production accordingly. Obviously, you need to find the best price for your products too. You want the maximum profit!

2. Production

The production window allows you to manage your product. You find here any information about your products and materials in stock and production capacity.

¹ Disclaimer: Forecasts may in fact not be accurate!

Unlock advanced products here. You can also adjust the production goal here.



Picture 2: Production Window - Info Tab

1. **Tab selection**

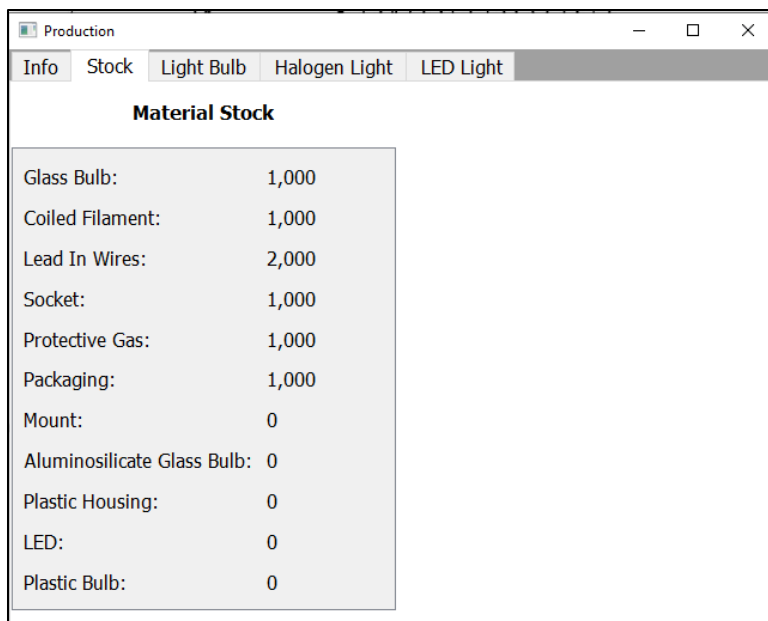
Every tab displays specific information (products, material stock and general). Within the product tabs you can unlock advanced products.

2. **Info**

This displays your current product, product stock and production capacity.

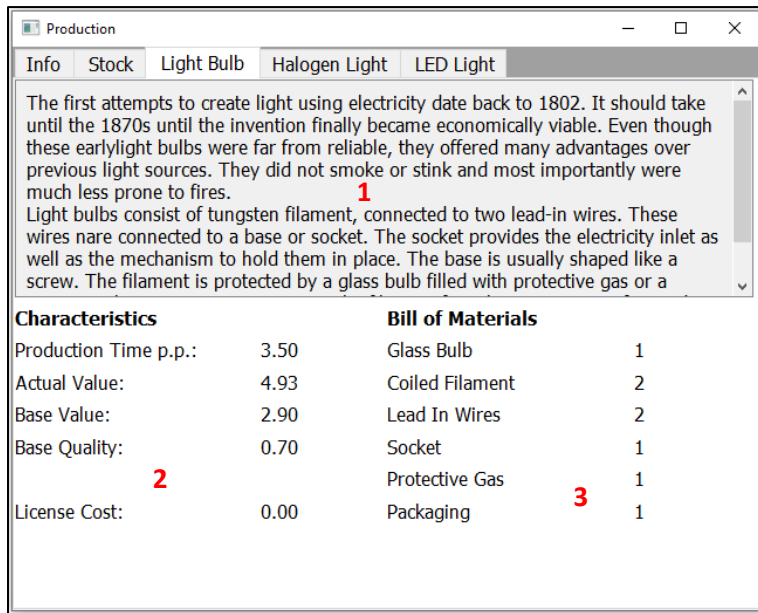
3. **Production Goal**

Per default your factory will always produce as much as possible, or the maximum capacity. You can enter a specific production goal for one turn here.

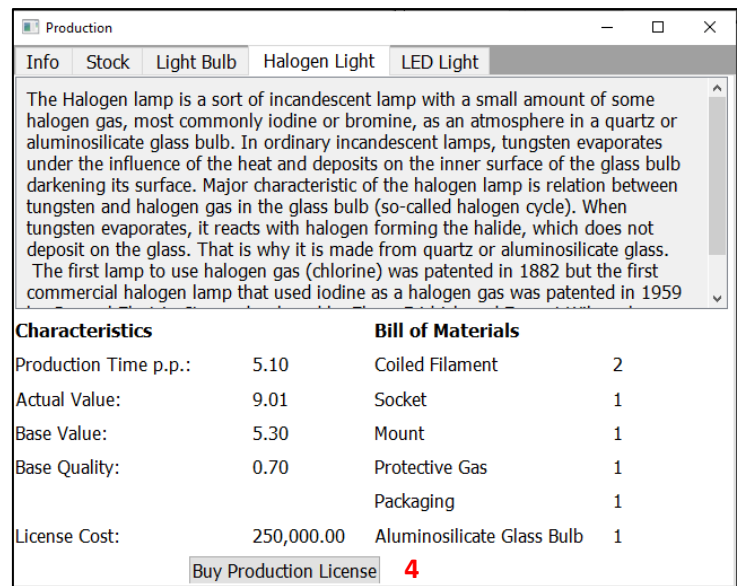


Picture 3: Production Window - Stock Tab

The current stock of raw materials is shown here. You start with enough material to produce 1,000 units of light bulbs.



Picture 4: Production Window - Light Bulb Tab



Picture 5: Production Window - Halogen Light Tab

1. Description

A description of the products history and production processes.

2. Characteristics

Every product shares these main characteristics:

Production time p.p.: per piece per minute, foundation for the production capacity

Actual Value: The price customers are willing to pay without bonuses or maluses.

Base Value: Used to calculate the actual value.

Base Quality: Used to calculate the actual value. Improves the base value.

3. Bill of Materials

The list of materials and their number necessary to manufacture one unit of the product.

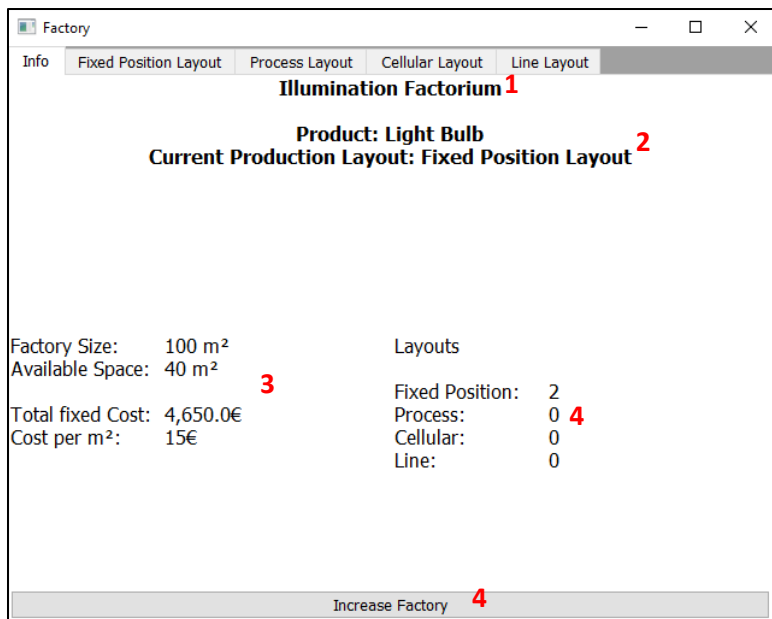
4. Production License

If you can afford the licence cost, you can buy the license for a new product.

Unlocking new products is costly but will pay off. They are of higher value than the regular light bulb and will increase profits. Apart from the light bulb, there are also Halogen and LED Lights.

3. Factory

The Factory-window bundles all information about the factory itself. All the physical aspects are managed here: Factory size, production layouts and layout departments.



Picture 6: Factory Window - Info Tab

1. **Factory Name**
2. **Current product and employed production layout**
3. **Factory Characteristics**

The factory has a certain size, that is occupied by your production. Try to use it optimally. Unused space still costs. The fixed costs increase for space occupied by layouts, because of the additional machinery and infrastructure.

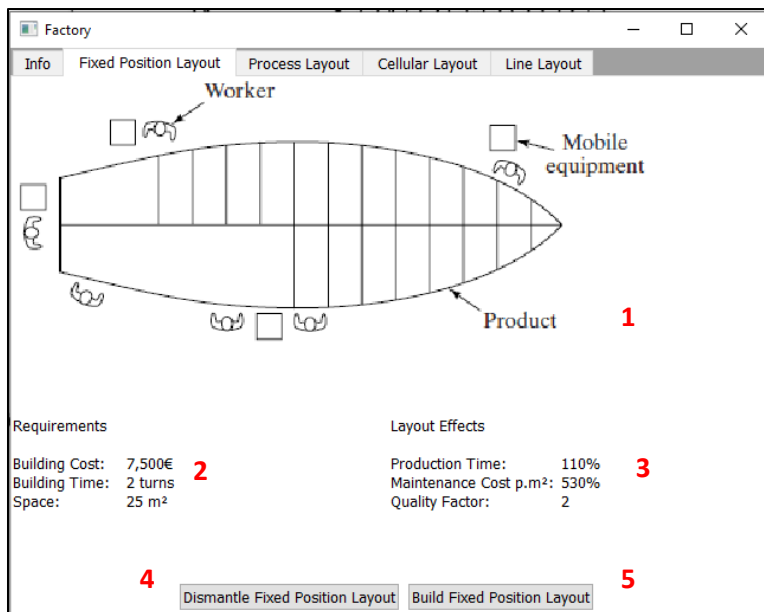
4. **Layout numbers**

This panel displays the number of each layout you currently employ. While you can have as many Fixed Position and Line Layouts as you can afford, you can only build one Process and one Cellular Layout.

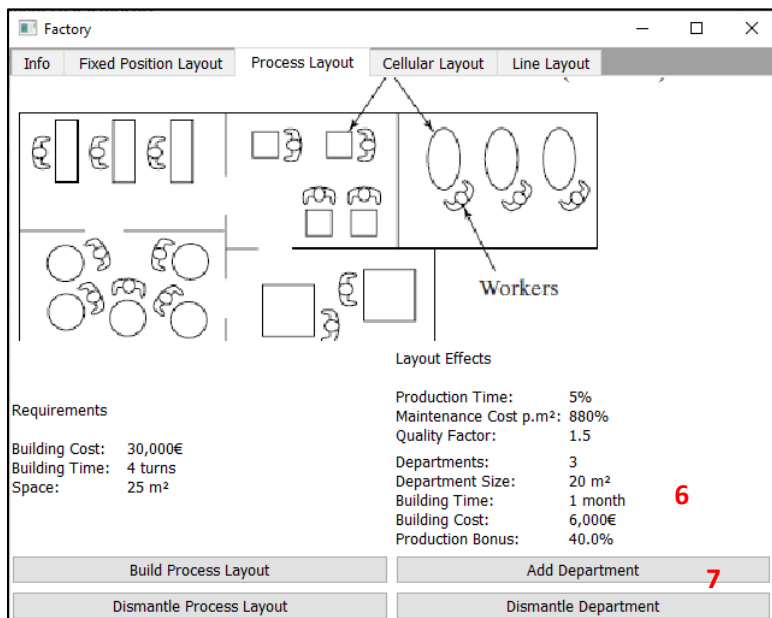
5. **Increase Factory**

Each m² costs 1,000€ to build.

Increasing the factory is effective immediately. You should aim for not having unused space. Even though it is far less expensive than production fixed cost, it still costs 15€ per m² per turn. It is best to only expand the factory right before building a new layout or department.



Picture 7: Factory Window: Fixed Position Layout Tab



Picture 8: Factory Window - Process Layout Tab

1. Layout description

A description and possibly picture describing the characteristics of the selected layout.

2. Layout building requirements

Each layout has a specific building price, building time and space requirements.

3. Layout effects

Each layout impacts mainly the production time and base quality of the product. The maintenance cost per m² increase the factory's fixed cost for the occupied space by the given rate.

The *Quality Factor* currently has no effect. It is intended to change the quality of the produced product and will come in a future release of the game.

4. Dismantle Layout

If you take a layout out of service, you can reuse the space it occupied. No money is refunded currently, and the dismantling is effective immediately.

5. Build Layout

If you build a new layout or department, you immediately pay the price for it and the required space is blocked instantly. The higher fixed cost per m² and the changed production capacity come into effect after the building is finished (e.g., after 2 turns for the Fixed Position Layout).

6. Department characteristics

The Process and Cellular Layout types use departments. Only one of these layouts can be built. For increasing production capacity new departments must be added. Departments grant specific bonuses on production.

7. Department dismantling/building

If you take a department out of service, you can reuse the space it occupied. No money is refunded currently, and the dismantling is effective immediately.

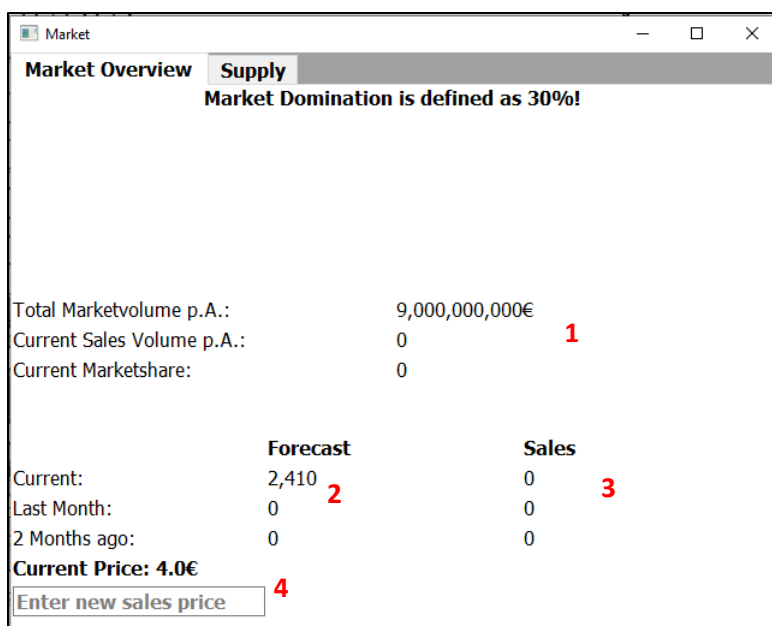
Building a department has to be paid immediately and comes into effect after the building time.

The process and cellular layouts feature another speciality with their departments: Their production output grows exponentially with the addition of departments. Beware that the cost of new departments also grows exponentially. They are a great deal at first, but become ridiculously expensive at some point.

4. Market

The Market-window offers any important information about the illuminate market – which you are competing in. Prices for sales and supplies are managed here.

Additionally, the progress towards the market domination can be viewed here.



Picture 9: Market Window - Overview Tab

1. **Market Overview**

The Total Market volume changes, usually grows, after twelve months. Your market share is cumulated for twelve months. It is calculated with the sales income in €.

2. **Sales Forecast**

Forecasted Sales for the next month and past 2 months.

3. **Actual Sales**

Number of sold units for the past three months.

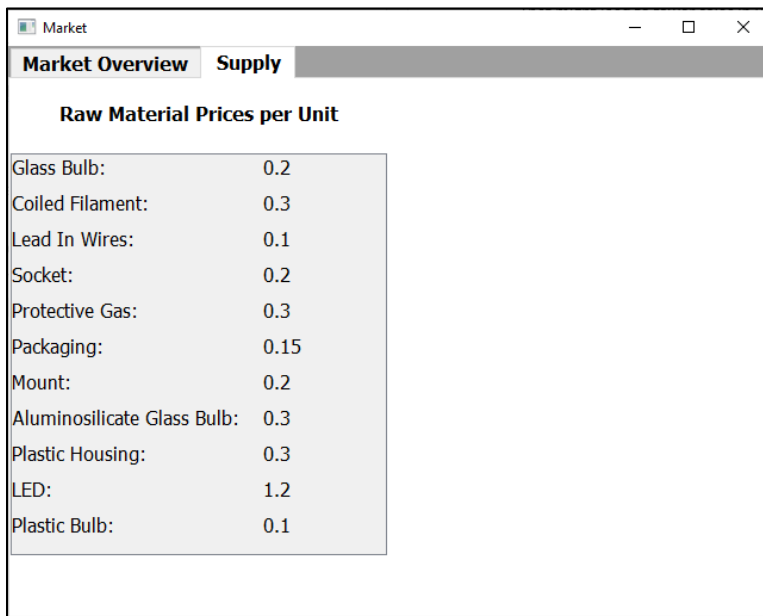
4. **Sales Price**

This is arguably one of the most vital numbers for your company. Adjust the sales price around the actual value of your product.

On a surface level the price formula is simple: The higher the price, the fewer units will be sold and vice versa. The actual value of the current product is the point of reference for the sales. If the sales price is equal to the actual value customers will neither be gained nor lost – apart from some random influences one cannot account for.

In most cases it is best to set the sales price at somewhere between 1.2 – 1.6 times the actual value. That will lead to fewer sales in units. This disadvantage is usually outweighed by the monetary gain in profits.

In certain situations, it is also advantageous to lower the sales price even below the actual value. This will attract a large number of new customers and increase sales by units. It will likely result in a monetary loss because products could be sold below their manufacturing cost. This might still be worthwhile in cases, where your production capacity is expanded greatly. Once a customer is won, he is likely to buy again even after a price increase. In short: Many new customers can be won with low prices and remain customers later – analogous to a short-lived sales offer in retail.



The screenshot shows a window titled 'Market' with two tabs: 'Market Overview' and 'Supply'. The 'Supply' tab is active, displaying a table titled 'Raw Material Prices per Unit'. The table lists various raw materials and their corresponding prices per unit.

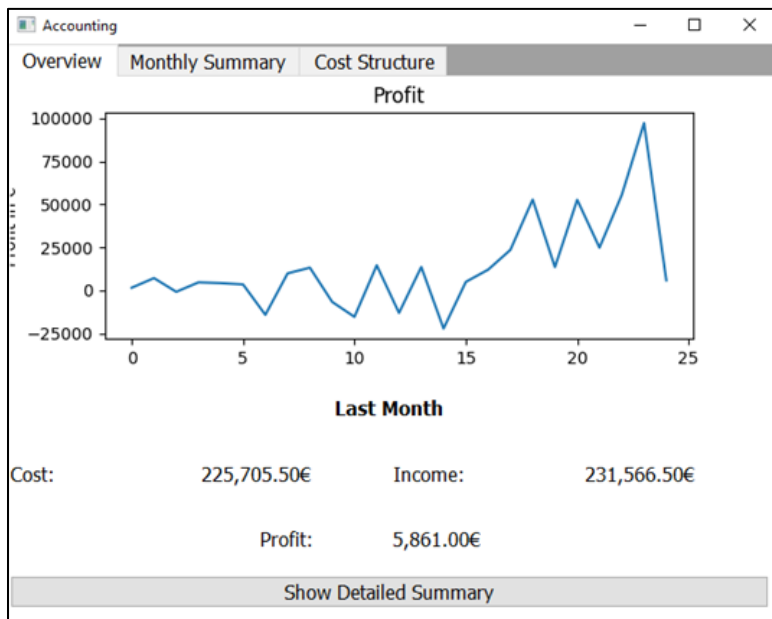
Raw Material Prices per Unit	
Glass Bulb:	0.2
Coiled Filament:	0.3
Lead In Wires:	0.1
Socket:	0.2
Protective Gas:	0.3
Packaging:	0.15
Mount:	0.2
Aluminosilicate Glass Bulb:	0.3
Plastic Housing:	0.3
LED:	1.2
Plastic Bulb:	0.1

Picture 10: Market Window - Supply Tab

In the Supply tab current prices for all needed raw materials are given. Possibly you might be able to manage suppliers here in the future as well.

5. Accounting

The Accounting-window is the balance sheet of company. Details about all important numbers are displayed here.



Picture 11: Accounting Window - Overview Tab

The Accounting window displays the Monthly Summary tab. It shows a table with the following data:

	Cost	Income	Profit
1	6,221.00	7,944.00	1,723.00

Picture 12: Accounting Window - Monthly Summary Tab

The Accounting window displays the Cost Structure tab. It shows a table with the following data:

	Total Cost	Fixed Cost	Supply Cost	Building Cost
1	6,221.00	4,650.00	1,571.00	0.00

Picture 13: Accounting Window - Cost Structure Tab

The overview shows the result of the past turn (last month).

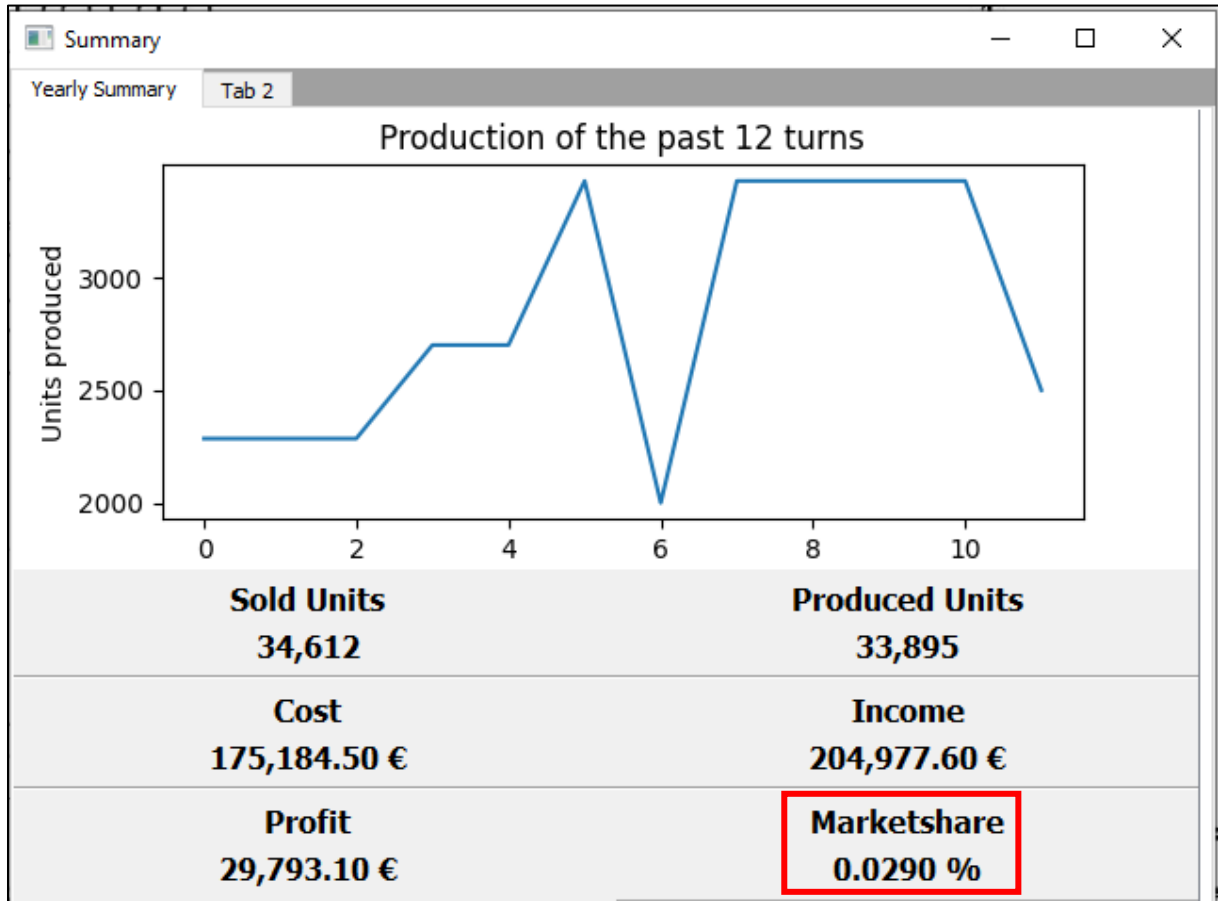
The Monthly summary is the archive of past results.

In the Cost Structure tab you find detailed how your cost breaks down.

6. Summary

At the beginning of every 13th turn or after each year, you get a detailed summary of the past years achievements.

The produced units are displayed in the graph. The numbers below are cumulated over the past 12 months. The Marketshare is of the highest importance. You need to reach 30%!



Picture 14: Yearly Summary Window

7. Tutorial

7.1 Start

Welcome!

Don't we all dream of this distant relative, that no one has ever heard of. Suddenly said distant relative dies under unspecified circumstances, leaving us in the fortunate situation to be their lucky heir?

Dream no longer! As the official note you're just holding in your hands says: You had a cousin of 5th degree, who recently passed away without an heir. That is: without any heir but you! Apparently, he owned an entire factory that produced light bulbs. And all of a sudden you are a businessman now! Of course, you immediately pack your luggage and travel to your new factory!

In large letters over the main gate, you read the name of your factory: **Illumination Factorium**.

However, the disenchantment follows soon: The factory is far from its best state. A huge portion of the large building stands empty. Only two working spaces are suitable for production. And they organised as fixed position layouts! Cheap, yes, but probably not best suited for a mass produced good like a light bulb.

The old production manager shows you around. And despite the desperate state of the factory, you cannot help but see the potential! There is even a small amount of cash available. Of course, your new employees watch every single of your steps. Is it that hope you can see in their eyes?

Production

You own two operational Fixed Position Layouts with sufficient machines and workers. Fixed Position Layouts are rather cheap in setup, but also not very efficient in production. Your late cousin had this thought as well and had expansion plans. Sadly, he only managed to enlarge the production hall before he died. At least you have plenty of room for further expansion. Also, the stock is relatively well filled with about 1,000 light bulbs and enough raw materials for another 1,000.

Accounting

Well, you have 10,000€ in cash. That's pretty much it. You need to make smart decisions to turn this into a real fortune. Otherwise, it will be gone as quickly as you got it. At least with a new owner the banks might be more willing to give new credits. In fact, when you contact the bank, they immediately offer you a credit range of another 10,000€.

Market

The entire European illumination market is estimated to measure about 9 billion € per year!

Our sales department is confident, that they could reach market domination, if you could only produce enough goods. That is 30% of the entire market volume. A bold statement, even for an established well-functioning company! Given the run-down state of the **Illumination Factorium**, this seems to be downright madness.

However, the news of a new, young and hungry owner might not only spur the sales team and actually every single employee of our small family business. It might be the needed spark to restart relations with customers!

A strong fresh wind seems to blow through the **Illumination Factorium**!

7.2 Turn 0

Production

Have a look at the production window. In the “Info”-tab you find your stock of current products, your production capacity and you can set a specific production goal. Now go to the “Light Bulb”-tab.

Main Window

Turn 0 of 60

Capital: 10,000.00€

Production Window

Info Stock Light Bulb Halogen Light LED Light

Current Product: Light Bulb

Products in Stock: 1,000

Production Capacity: 1,460

Produced last month: 0

Production Goal: Max. Capacity

Enter production goal

Light Bulb Tab

The first attempts to create light using electricity date back to 1802. It should take until the 1870s until the invention finally became economically viable. Even though these early light bulbs were far from reliable, they offered many advantages over previous light sources. They did not smoke or stink and most importantly were much less prone to fires.

Light bulbs consist of tungsten filament, connected to two lead-in wires. These wires are connected to a base or socket. The socket provides the electricity inlet as well as the mechanism to hold them in place. The base is usually shaped like a screw. The filament is protected by a glass bulb filled with protective gas or a vacuum.

Characteristics		Bill of Materials	
Production Time p.p.:	3.50	Glass Bulb	1
Actual Value:	4.93	Coiled Filament	2
Base Value:	2.90	Lead In Wires	2
Base Quality:	0.70	Socket	1
		Protective Gas	1
License Cost:	0.00	Packaging	1

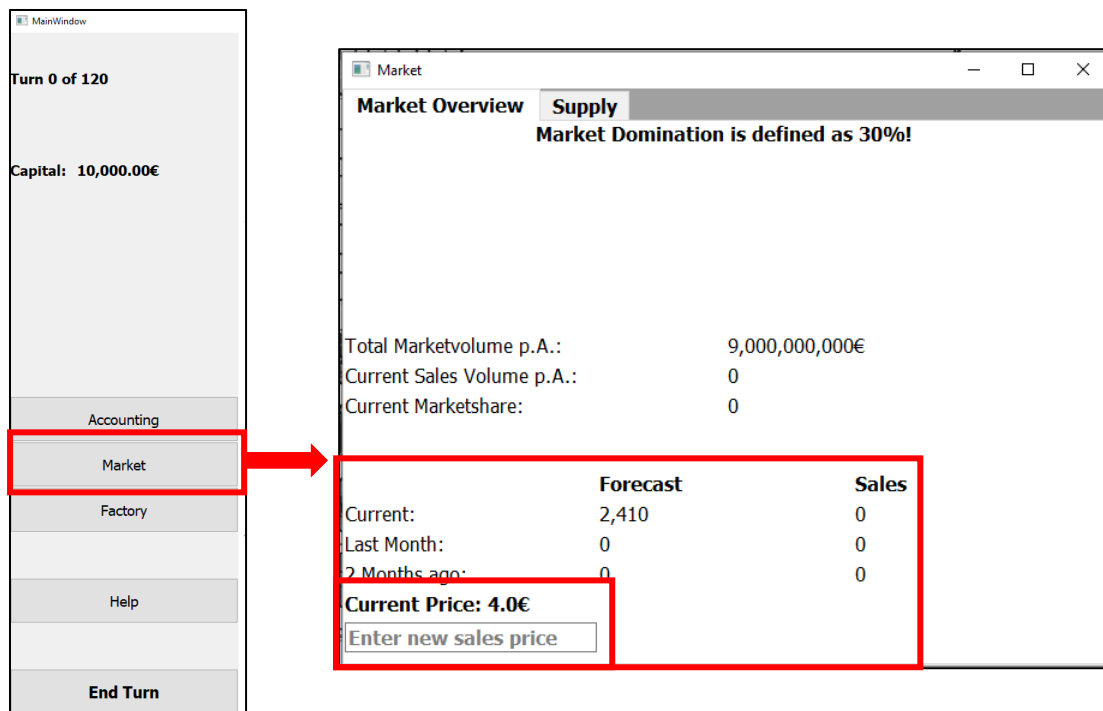
Here you find the most important characteristics about the Light Bulb, including the bill of materials. You have the production time per piece in minutes, the actual value, base value and base quality of your product. The license cost is 0, because you already own the Light Bulbs recipe. Later in the game you purchase more advanced products.

The actual value is currently 4.93. This means, reasonable customers are willing to pay 4.93€ for your light bulb. If you sell at this price, you can expect to sell most of your products, but you will not raise additional attention. If you sell for a lower price, you will attract additional customers – a good way to get rid of a large stock or to raise attention during a large production capacity increase. If you sell at a higher price, you will sell progressively fewer units. A much too high price will even result in no sales at all – a disaster to avoid at all costs!

Generally, the best strategy is to sell at a higher price, to not lose to many customers, but to maximize profits. As a rule of thumb, you can expect this sweet spot to be around 1.2 – 1.6 times the actual value.

Market

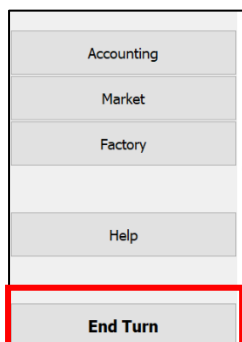
Have a look at the “Forecast” and “Sales” table at the bottom of the window. The sales team generates a forecast for the next month. It is mostly accurate, but of course you cannot precisely predict your customers behaviour – expect some deviations. You can orientate your production around the forecast.



Note that the current price is set to 4.0€. That is below the actual value of your Light Bulb of 4.93€. That means you will probably sell more than the predicted amount. Since you have 1,000 units in stock and can produce 2,285 units this month, this might not be worst option. However, we want more profit! Change the price to 5.2€ now. Enter 5.2 into the entry space and hit enter. Now the current price should have changed to 5.2€

You can now adjust your sales price!

Now hit the “End Turn”-button to end this round!



7.3 Turn 1

Accounting

You might realise, that your capital has changed. You should see that you have made some decent profit in the past turn! To see how much and get information about your exact income, costs and profits press the “Accounting”-button. This is your balance sheet.

The screenshot shows the 'Accounting' window with the 'Cost Structure' tab selected. A red box highlights the 'Capital: 16,135.00€' in the main menu on the left. Another red box highlights the 'Accounting' button in the same menu. A red arrow points from the 'Accounting' button to the 'Cost Structure' tab in the Accounting window. The 'Cost Structure' tab displays a table with the following data:

	Cost	Income	Profit
1	7,145.25	13,280.80	6,135.55

Now open the “Market”-window again. You can now see the forecast for the coming month and what you actually sold in the past month. Remember your production capacity of 2,285 units! You have sold more than you produced, meaning you reduced your stock. Good!

Factory

Now press the “Factory”-Button. In this window you lay the foundation for your success. You can increase your production capacity. First you find the most important information about the factory. E.g. the size of the entire factory, the available space, the total fixed cost and so on. Most importantly you can manage the production layouts here. Currently you have 2 Fixed Position Layouts employed. Go to the “Fixed Position Layout”-tab now.

The screenshot shows the 'Factory' window with the 'Fixed Position Layout' tab selected. A red box highlights the 'Factory' button in the main menu on the left. A red arrow points from the 'Factory' button to the 'Fixed Position Layout' tab in the Factory window. The 'Fixed Position Layout' tab displays the following information:

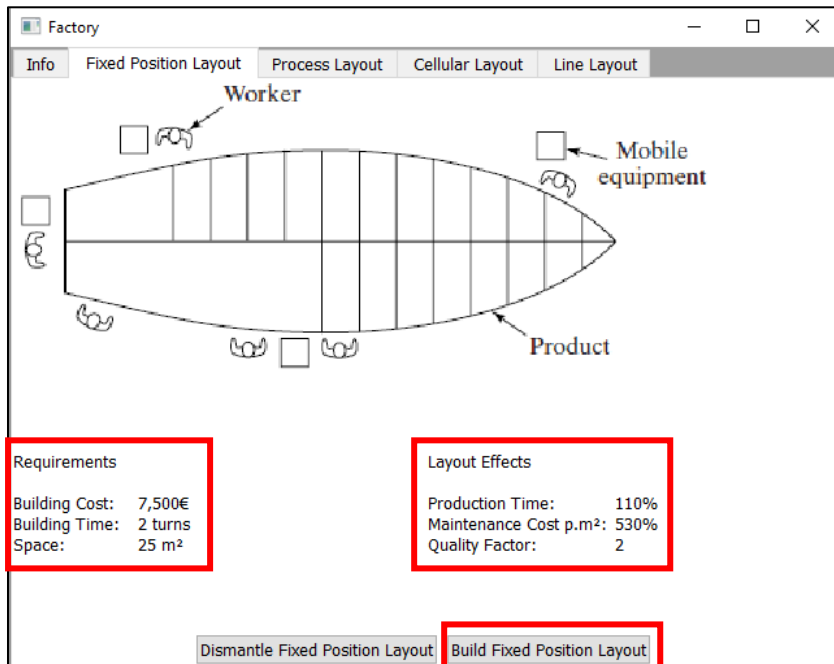
Illumination Factorium
Product: Light Bulb
Current Production Layout: Fixed Position Layout

Factory Size:	100 m ²
Available Space:	50 m ²
Total fixed Cost:	4,725.0€
Cost per m ² :	15.0€

Layouts	
Fixed Position:	2
Process:	0
Cellular:	0
Line:	0

At the bottom of the window, there is a button labeled 'Increase Factory'.

Each layout grants specific bonuses and maluses that influence the production capacity and quality. Generally speaking, your goal is to progress through all of them and produce and sell as much as possible.



Now press the “Build Fixed Position Layout”-button in the bottom right. Confirm the build order. You see, that the 7,500€ building cost were immediately deducted from your capital. In the “Info”-tab you can now see, that instead of 50m² you only have 25m² of available space left. The total fixed cost have not changed – yet.

Now increase you sales price again in the “Market”-window. Set it to 6.9€.

Now hit the “End Turn”-button to end this round!

7.4 Turn 2

Note that you have still made a little profit – despite selling less units than the last month and building the new Fixed Position Layout!

Overview		Monthly Summary		Cost Structure		
	Total Cost	Fixed Cost	Supply Cost	Building Cost		
1	7,145.25	4,725.00	2,420.25	0.00	1	7,145.25
2	15,995.25	4,725.00	3,770.25	7,500.00	2	15,995.25

Overview		Monthly Summary		Cost Structure		
	Cost	Income	Profit			
1	7,145.25	12,875.20	5,729.95			
2	15,995.25	16,428.90	433.65			

The new production layout needs another month for completion. Have a look at your sales forecast for the coming month. It should be around 2,500 units. If you compare that to your current stock and production capacity, you will find that you could sell around 3,000 units this turn. You do not want to produce to stock. Some safety stock for unexpected additional sales is fine, but not too much. One possibility is to reduce your stock even more by reducing the sales price.

	Forecast	
Current:	2,520	Products in Stock: 713
Last Month:	2,502	
2 Months ago:	2,501	Production Capacity: 2,285

But since you make a decent profit with the current price, you will now change the production goal. As you see it is currently set to maximum capacity, which is the default. Set the production to 2,500 now.

Production Goal: Max. Capacity

You will now produce less than you actually could. The advantages are the stock reduction but also that you need to buy less raw material for your production. You directly save money this way. Now obviously this is a short-term measure since you generally want to use your maximum capacity. **If you do not specify a production goal, it will reset to maximum capacity the next month again.**

By the way: You can set a production goal higher than your maximum capacity. You will not produce more, but your diligent supply staff will buy the material needed for the production anyway. Be careful!

Now hit the “End Turn”-button to end this round!

7.5 Turn 3

Note that you have once again increased your profits. And this time you also reduced your cost! Great!

Depending on your luck, you might even have sold your entire stock now! Play around a bit with the price, production goal and forecast now.

Hit the “End Turn”-button when you are done!

7.6 Turn 4

Maybe you just found that you have made your first loss in this round. This is due to a sudden cost increase. If you go the factory window, you can see, that the fixed cost changed from 4,750€ to 6,337€ now – terrible! On the positive side, that also means, that your new fixed position layout is now ready to operate. If open the “Production”-window again, you see that your production capacity has now increased from 2,285 to 3,428 units. Great!

Factory Size: 100 m ²	Production Capacity: 3,428
Available Space: 25 m ²	
Total fixed Cost: 6,337.5€	Produced last month: 2,285
Cost per m ² : 15.0€	

Now again you have two options to make the most of it:

1. Produce only a little bit more than your sales forecast expects.
You might not use the full production capacity but save cost. You can keep your higher price, which should result in a higher profit. But it will take longer, until you can actually sell your entire capacity. You will also need to adjust your production capacity manually for a few months to avoid overproduction.
2. Produce the maximum capacity immediately.
To immediately sell the maximum capacity you could drastically lower your sales price. Go below your actual value to boost sales. You can achieve higher sales much faster that way. However, this is highly likely to result in a huge loss. It is only suitable if you can afford that. Of course, you also need to increase your sales price again as soon as you reach the maximum capacity.

Go with a mixture of both options: set the production goal to 2,700 and reduce the sales price to 4.8€.

Hit the “End Turn”-button when you are done!

7.7 Turn 5

Check your sales and balance. If you are lucky, you will have sold the entire production and even made a tiny profit.

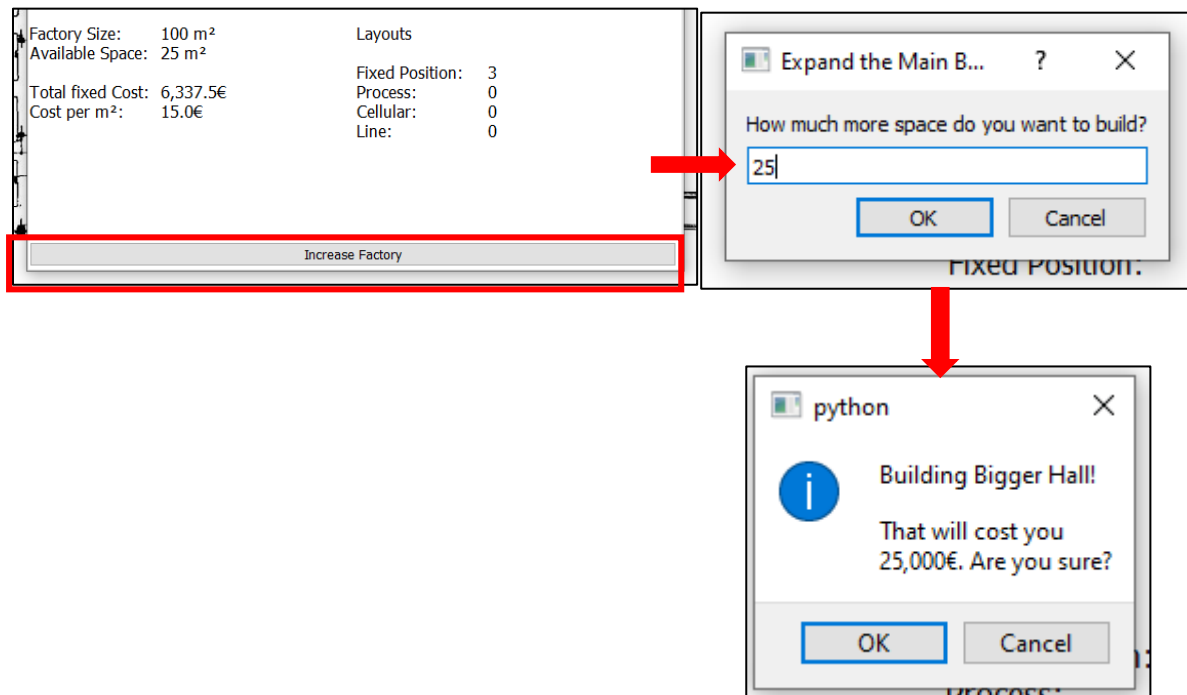
Adjust your production capacity again according to your forecast. If you didn't increase your sales, consider lowering your price a little bit. Play around a bit with the price, production goal and forecast now.

Hit the "End Turn"-button when you are done!

7.8 Turn 6

Now that you have learned the way of maintaining profits, let's take a look at the factory again. As you will notice, you only have 25m² of available space left. Just enough to build another fixed position layout, which needs at least 25m². But you could build at least two new layouts now.

Navigate to the "Info"-tab in the "Factory"-window and press the "Increase-Factory"-button. Now enter 25 in the prompt and confirm the build order.



You might notice, that this operation costs you 25,000€. Now will probably not have enough funds left for the new layouts.

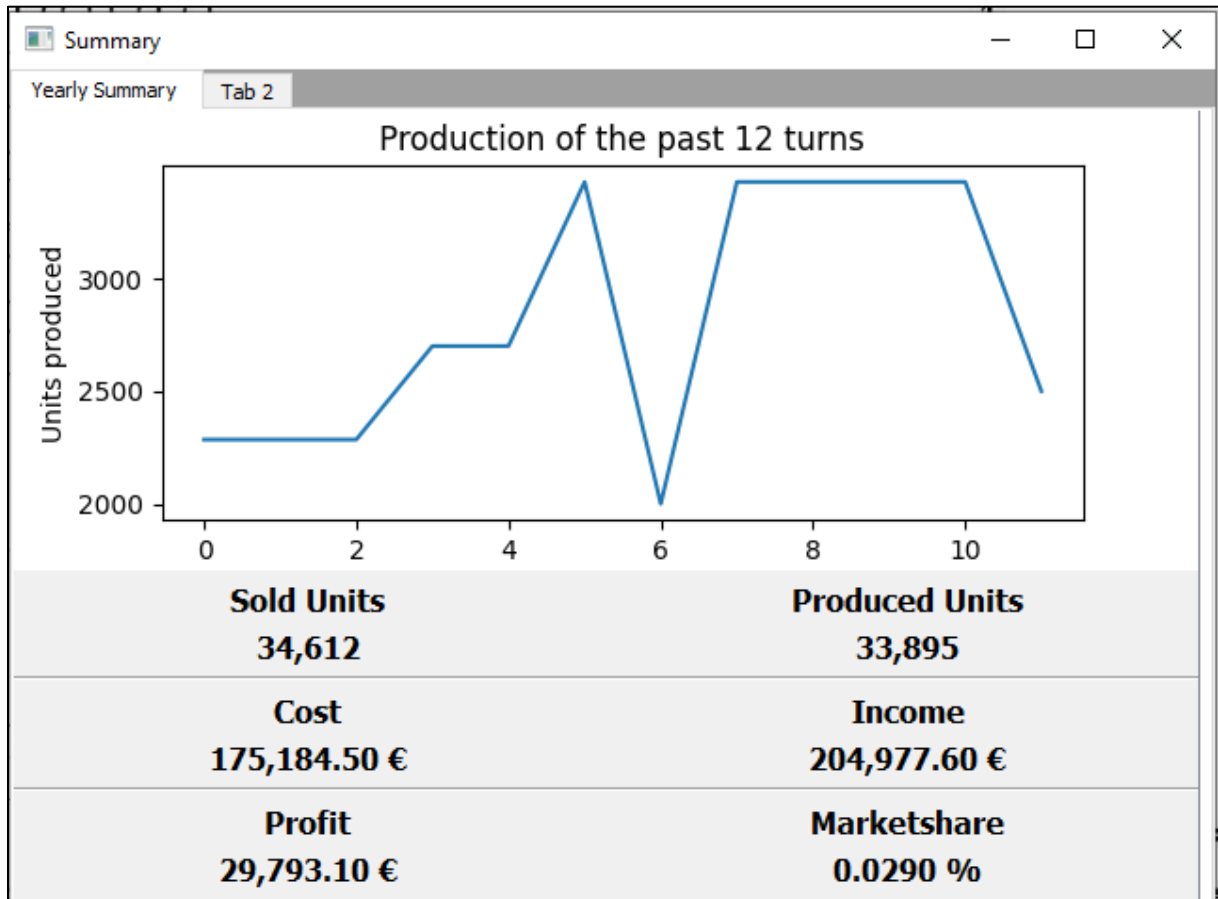
Luckily the bank has your back and offers you a credit of 10,000€. A gesture of good will towards the new owner! If you can already build the required space, do so now. Otherwise gather enough funds to expand your factory by 25m² and then make the build order.

7.9 Turn 12

Congratulations! You have finished your first year as a light bulb tycoon!

You can now check out, what you have accomplished in the yearly summary window, that pops up.

Did you come closer to the goal of market domination?



You can always open the game manual by pressing the "Help"-button.

8. Figures

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