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| <deleted> | **Sample Only**  This document was submitted by students in a previous class. Their requirements were different from yours. We offer it only as a sample of what a project was for that class. Copying this document, in whole or in part, and submitting the result as your own work, would be a violation of the honor code. |
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**Range Names**

All of the Range names used in the BEL123 model are listed on the Parameters Sheet. This list also contains the sheet and cell addresses of all of the range names.

**Parameter Sheet**

Any of the values for the parameters on this worksheet can be changed independently because there are no formulas attached to these cells. There is one parameter block that is ranged named as “hourly wages” which is used in the calculation of lower-level salaries. If this ranged was to be altered in any manner, the address attached to the block would need to be changed accordingly (Insert-Name-Define). The parameters are grouped into blocks and categorized. The conversion factor block is used to standardize all data into quarterly format, and the data given in prices and costs are in terms of US $.

*Input Streams*

# Price of Goods

This is a simple worksheet with values manually entered, containing no formulas. The price of hats and shirts is left to the discretion of the user and can be altered independently.

## Production

Again this is a relatively straightforward worksheet. The values for hats and shirts produced are manually entered at the discretion of the user. There is a simple formula that adds the shirts and hats produced in each quarter. Any change in the number of hats or shirts produced will lead to a change in the sum.

## Inflation Analysis

This table worksheet represents the inflation increase per quarter. The first row of the table shows an input stream. The second row shows the inflation analysis per quarter which is calculated by multiplying the previous quarter inflation by the expected inflation rate for the quarter. The first quarter of the first year is the starting point so we assumed one as the default value. Finally, the last cell represent the average inflation rate for the whole period, which is calculated using the average function in excel.

*Hiring Stream*

This worksheet is divided between two tables. The first table calculates the *hiring stream per quarter*. For the janitors we randomly assumed that only two janitors would be needed throughout the business cycle, we decided to add one at the beginning of the business and another janitor at the middle since we are assuming growth. To calculate the hiring stream for the hat maker, shirt maker, and engineer we used the array multiplication. We multiplied the employees per machines by the machines purchased. For the supervisors needed we used the ceiling formula by adding the number of hat and shirt makers and rounding it to the nearest integer. The second table shows the *cumulative hire stream, which* is calculated by using the running sum from the values of the previous table.

*Ordering*

This worksheet is used to calculate the total number of machines needed and the actual machines purchased. We calculated this data stream by using the ceiling formula, we used it based from the parameter of production divided by the hats and shirts per machine. Then we used the IF statement to calculate the additional machines needed. In this worksheet we also used Economic Ordering Quantity which is used to estimate the optimum order quantity for a constant demand. We used this data to calculate the optimum cost for ordering supplies.

*Depreciation, Lease and Debt*

In this worksheet we depreciated the machines for the three years. We did this on a quarterly basis, which is broken out into twelve periods. We took into account, the additional machines purchased, which is shown on the total equipment value. On the last row of the data stream we show the total value of the machines that appears on the balance sheet. This is calculated by subtracting the total equipment value minus the depreciation, for this we used the array formula.

This worksheet calculates the lease payments and interests from leasing the computers, it uses the ripple principle, which means that when changes are made in the model the entire model is changed. In addition, to calculate the payment PQ, liabilities, assets, depreciation and interest payment we used the convolve function.

For this table we assumed that the company is financed by a percentage of debt. Therefore, they issued a bond at par of 1.5 millions, which will mature on the third year, paying interests quarterly. We calculated the net present value.

*Salaries*

This worksheet represents the salary of the employees that are paid hourly. This includes, the janitors, hat and shirt makers, engineers and production supervisor. On the first table we calculated the total hours per group of employees per quarter, we used the arithmetic array by multiplying *CumHireStream\*HoursPQ.* On the second table we calculated the base wage per quarter, where we also used the multiplication array. The formula used was the following: *HourlyWages\*CumLaborHours*. The last table represents the total wages paid per quarter with and without inflation adjustment.

This worksheet shows the salary for those employees that are paid an annual salary. The first table represents the base salary per employee. This data was manually entered based from the average market wage. The second table shows the total wage paid which is the sum of the employee’s base salary. The second row in that column represents the total salary adjusted for inflation. The third table represents the bonuses paid to the employees based from the net income per quarter. The first quarter on this column is zero since we are assuming that we would pay the bonuses on the following quarter based from the previous quarter performance. For the employees to be entitled to a bonus we assumed that if the total net income exceeded zero, employees would be receive .01% of the profits. The last table shows the total salary for the employees which is calculated by adding the base salary with and the bonus.

*Variables and Fixed Expenses*

This worksheet represents the variables items such as the wages adjusted for inflation, the total bonuses paid per quarter, the cotton price which is the *TotalProduction\*CostOfCotton* calculated using and a multiplication array, and the lease payments per quarter. The last row on the table represents the sum of all the variable expenses.

This worksheet represents total fixed cost per quarter. The items in yellow are the parameter which we estimated throughout the quarters. The other items are the totals from other worksheets, and the last row represents the addition of all fix costs.

*Profit PQ chart*

This worksheet shows a bar chart that illustrates profits and costs per quarter. From the graph we can observe a high profit margin.

*Production Mix Chart*

This worksheets show a line graph which compares the total production of each item. It shows both the total production of hats and shirts.

*Profit and Loss Statement*

There are numerous calculations in the net income statement sheet. Hat and Shirt Revenue is calculated by multiplying the array Goods Produced by the Price Analysis array. Total Revenues is calculated by adding the results from the first calculation. Cost of Goods Sold is derived from multiplying the arrays Inventory by Cost of Cotton. Gross Profit is the differenced between Sales and Cost of Goods Sold. Gross Profit Margin is derived by dividing the Gross Profit by Sales. Operating Expenses is calculated by taking the sum of Total Fixed Expenses and Total Variable Expenses. To determine the Interest calculation, we took the sum of Coupon Payment and Lease Interest Payment Per Quarter. Depreciation is derived from the sum of Computer Depreciation and Equipment Depreciation. Income Before Taxes is the difference between Gross Profit, Operating Expenses, Interest, and Depreciation. To come up with BEL’s Taxes, we truncated the product of Corporate Tax Rate with EBT. Net Income was calculated by rounding the difference between EBT and Taxes to two decimal places. In addition, the Profit and Loss worksheet has three statistical calculations. The Max Net Income takes the maximum figure of the Net Income line, where Min Net Income takes the minimum value. Average Net Income takes the average of the Profit array.

*Named Cells and Ranges*

The following are named cells and ranges that the BEL123 model incorporates into its worksheets and processes:

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| --- | --- |
| ComputerDepreciation | ='Dep, Lease, & Debt'!$B$41:$M$41 |
| ComputerPayment | ='Dep, Lease, & Debt'!$B$14 |
| CorporateTaxRate | =Parameters!$B$42 |
| CostofComputer | =Parameters!$B$5 |
| CostofCotton | =Parameters!$B$4 |
| CostOfMachine | =Parameters!$B$6 |
| CostofOfficeSupplyperPackage | =Parameters!$B$9 |
| CostOfServices | =Parameters!$B$49 |
| CouponPayment | =Expenses!$B$25:$M$25 |
| CumHireStream | ='Hiring Stream'!$C$16:$N$20 |
| DepreciationPQ | ='Dep, Lease, & Debt'!$B$5:$M$5 |
| DepreciationTerm | =Parameters!$B$39 |
| EngineerHire | ='Hiring Stream'!$C$9:$N$9 |
| EngineersPerMachine | =Parameters!$B$20 |
| eoq | ='Ordering '!$B$11 |
| EqptDepreciation | ='Dep, Lease, & Debt'!$B$8:$M$8 |
| EquipmentPurchasedPQ | ='Dep, Lease, & Debt'!$B$6:$M$6 |
| ExpectedInflation | ='Input Streams'!$C$26 |
| GeneralAdministrative | =Parameters!$A$50 |
| GoodsProduced | ='Input Streams'!$C$13:$N$14 |
| HatMakersPerMachine | =Parameters!$B$18 |
| HatsPerMachine | =Parameters!$B$30 |
| HourlyWages | =Parameters!$B$23:$B$27 |
| HoursPQ | =Parameters!$B$35 |
| InflationAjustedWaqes | =Wages!$B$24:$M$24 |
| InflationAnalysis | ='Input Streams'!$C$23:$N$23 |
| Inventory | ='Ordering '!$B$7:$M$7 |
| LeaseIntPMTPQ | ='Dep, Lease, & Debt'!$B$42:$M$42 |
| LeasePaymentPQ | ='Dep, Lease, & Debt'!$B$38:$M$38 |
| LeaseRate | =Parameters!$B$45 |
| MachinesPurchased | ='Ordering '!$B$6:$M$6 |
| NewComputerPQ | ='Dep, Lease, & Debt'!$B$20:$M$20 |
| OfficeSupplyAnnualDemand | =Parameters!$B$13 |
| OfficeSupplyCasesPQ | =Parameters!$B$12 |
| OfficeSupplyHoldingCost | =Parameters!$B$11 |
| OfficeSupplyOrderCost | =Parameters!$B$10 |
| PriceAnalysis | ='Input Streams'!$C$5:$N$6 |
| PriceofHatsAnalysis | ='Input Streams'!$C$5:$N$5 |
| PriceOfShirtsAnalysis | ='Input Streams'!$C$6:$N$6 |
| Profits | ='P & L'!$B$23:$M$23 |
| SalesAndMarketing | =Parameters!$B$48 |
| ShirtMakersPerMachine | =Parameters!$B$19 |
| ShirtsPerMachine | =Parameters!$B$31 |
| SQPerHat | =Parameters!$B$16 |
| SQPerShirt | =Parameters!$B$17 |
| SupevisorHire | ='Hiring Stream'!$C$10:$N$10 |
| TotalBonusesPaid | =Wages!$B$44:$M$44 |
| TotalEquipmentValue | ='Dep, Lease, & Debt'!$B$7:$M$7 |
| TotalFixedExpenses | =Expenses!$B$26:$M$26 |
| TotalHighLevelSalary | =Wages!$B$45:$M$45 |
| TotalOfficeSupplyCostPQ | ='Ordering '!$B$14 |
| TotalProduction | ='Input Streams'!$C$15:$N$15 |
| TotalVariableExpenses | =Expenses!$B$10:$M$10 |
| TotalWagesPaid2 | =Wages!$B$35:$M$35 |