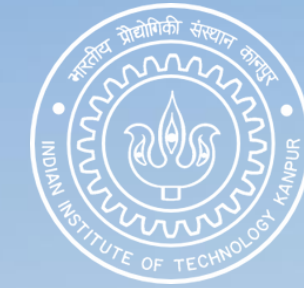


Week-06-L-04

ICT & Digital Applications

Digital Tools- In Windows

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Indian Institute of Technology Kanpur



Example in Excel



- In Excel, we use regression analysis to estimate the relationships between two or more variables.
- To recall:
 - Dependent Variable is the factor you are trying to predict.
 - Independent Variable is the factor that might influence the dependent variable.

- **Problem Statement**

Consider the following data where we have amount of wheat sown and harvested in a particular month in any given year. The given data is of an area of a city (Area is in acres)

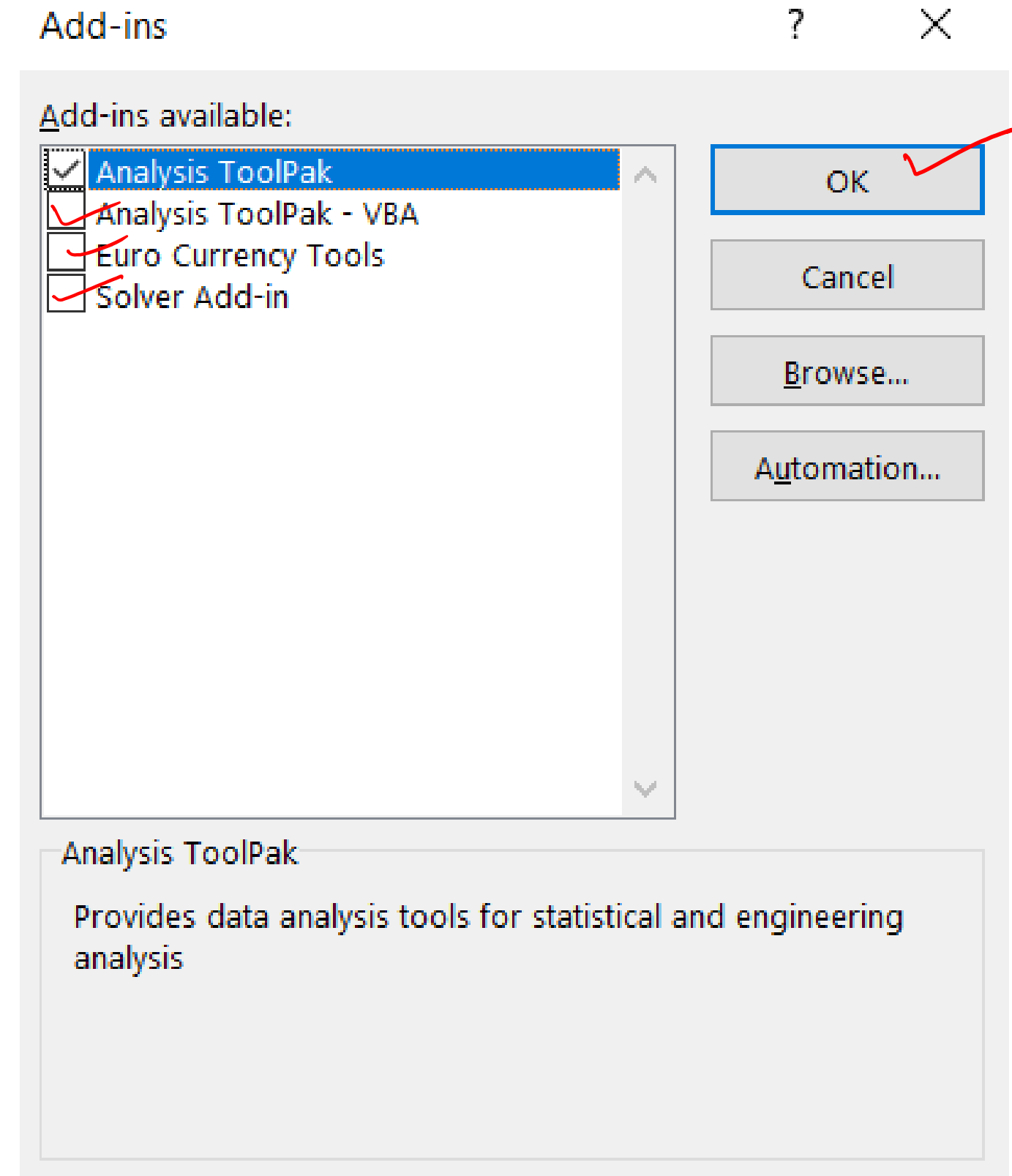
<i>Month</i>	<i>Sown area</i> ^(x)	<i>Harvested area</i> ^(y)	<i>Month</i>	<i>Sown area</i>	<i>Harvested area</i>
<i>January</i>	40	34	<i>July</i>	1120	1106
<i>February</i>	190	178	<i>August</i>	1383	1265
<i>March</i>	340	320	<i>September</i>	1690	1583
<i>April</i>	680	665	<i>October</i>	1722	1699
<i>May</i>	720	690	<i>November</i>	1841	1826
<i>June</i>	900	856	<i>December</i>	1945	1938

Solution

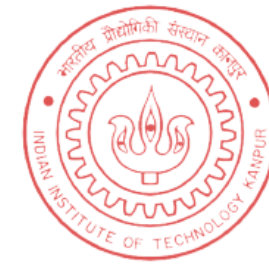


Step -1

- First we open MS Excel on our system
 - > open an Excelbook
 - > Search for Add-in &
 - > then select the option given aside.

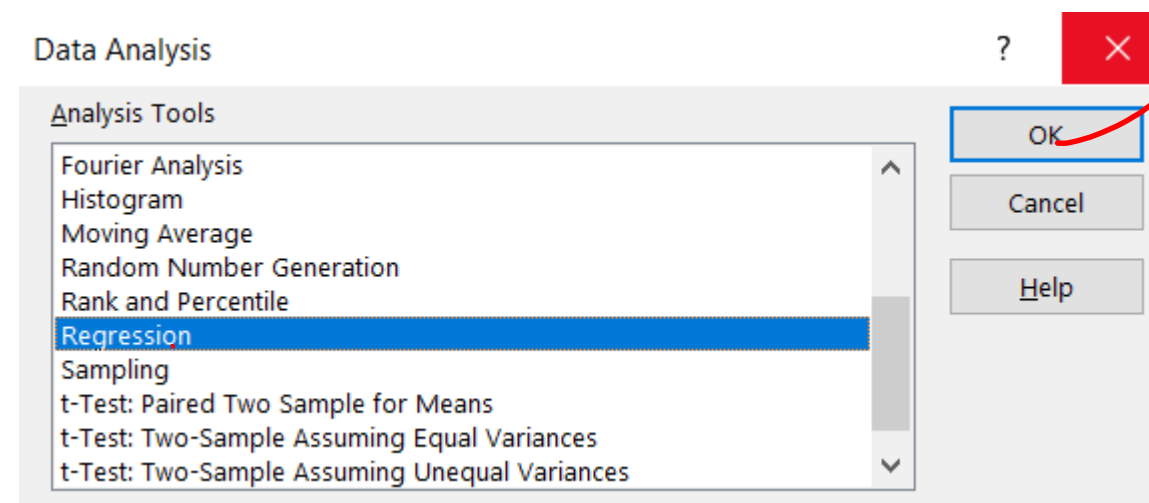
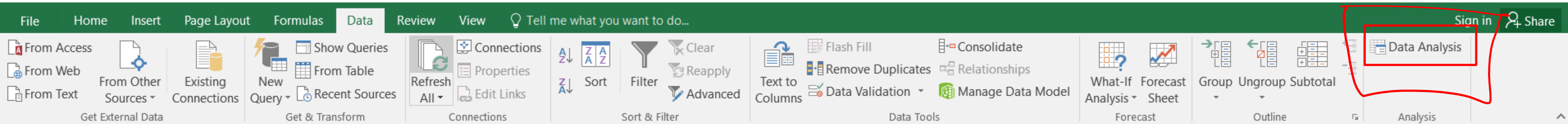


Solution



Step -2

- After adding it head towards Data option in the tool bar & click in Data Analysis then you'll be prompted to choose amongst many of the given option select Regression.



Solution



Step -3

- Add the given data into the sheet

Month	Sown area ^(x)	Harvested area ^(y)
January	40	34
February	190	178
March	340	320
April	680	665
May	720	690
June	900	856
July	1120	1106
August	1383	1265
September	1690	1583
October	1722	1699
November	1841	1826
December	1945	1938

Step -4

- Properly enter the ranges in the given dialog box

Regression

Input

Input Y Range: ^y

Input X Range: ^x

Labels Constant is Zero

Confidence Level: %

Output options

Output Range:

New Worksheet Ply:

New Workbook

Residuals

Residuals Residual Plots

Standardized Residuals Line Fit Plots

Normal Probability

Normal Probability Plots

OK Cancel Help

Solution

Step -5

- After clicking OK you'll get the following output



SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.99850321							
R Square	0.997008661							
Adjusted R Square	0.996709527							
Standard Error	37.7748612							
Observations	12							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	4755969.265	4755969	3332.98443	5.90161E-14			
Residual	10	14269.40139	1426.94					
Total	11	4770238.667						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 99.0%</i>	<i>Upper 99.0%</i>
Intercept	-14.99861898	20.88503935	-0.718151	0.489102288	-61.53338658	31.53614863	-81.18900346	51.19176551
X Variable 1	0.981623055	0.0170031	57.73201	5.90161E-14	0.943737788	1.019508323	0.927735595	1.035510515
RESIDUAL OUTPUT								
	<i>Observation</i>	<i>Predicted Y</i>	<i>Residuals</i>					
	1	24.26630323	9.733696765					
	2	171.5097615	6.490238476					
	3	318.7532198	1.246780186					
	4	652.5050586	12.4949414					
	5	691.7699808	-1.769980813					
	6	868.4621308	-12.46213076					
	7	1084.419203	21.58079708					
	8	1342.586066	-77.58606645					
	9	1643.944344	-60.94434442					
	10	1675.356282	23.64371781					
	11	1792.169426	33.83057424					
	12	1894.258224	43.74177649					

Solution

Step -6

- Interpret Regression Analysis Output



+1 -1 0



SUMMARY OUTPUT	
<i>Regression Statistics</i>	
Multiple R	0.99850321 ✓
R Square	0.997008661 ✓
Adjusted R Square	0.996709527 ✓
Standard Error	37.7748612
Observations	12

99.85%

Solution



- ANOVA Table

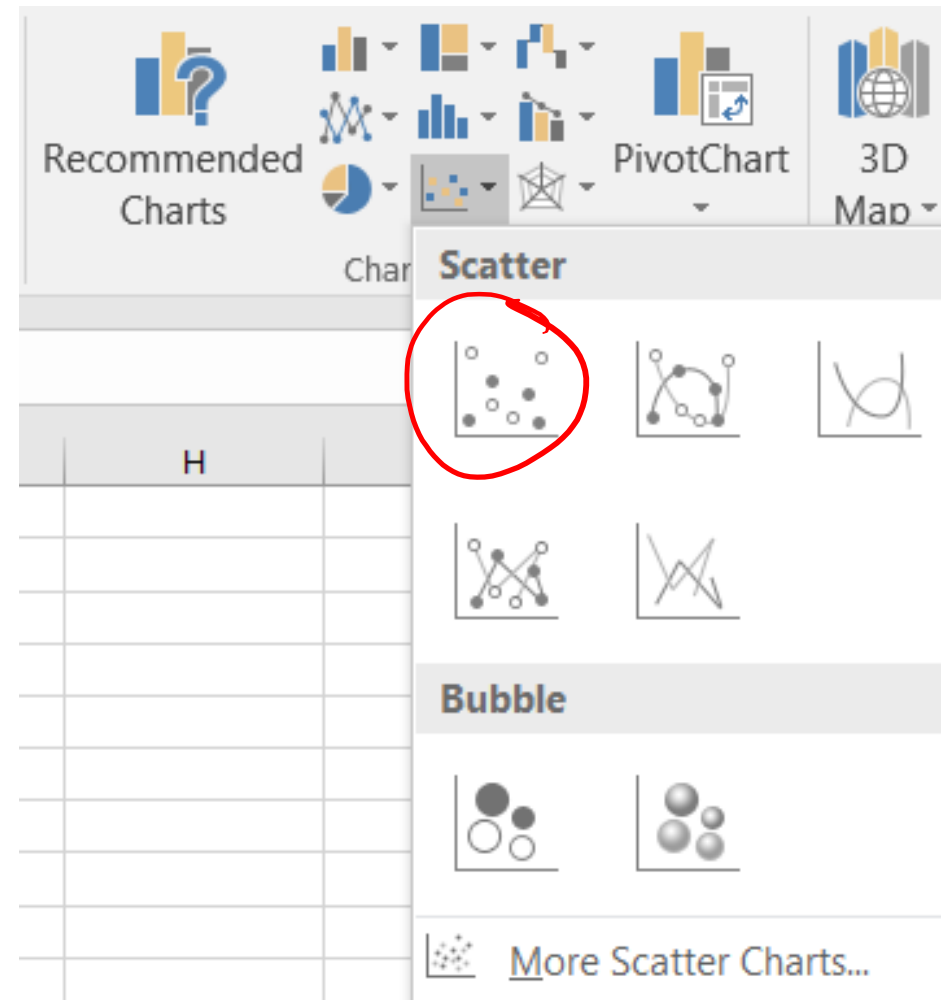
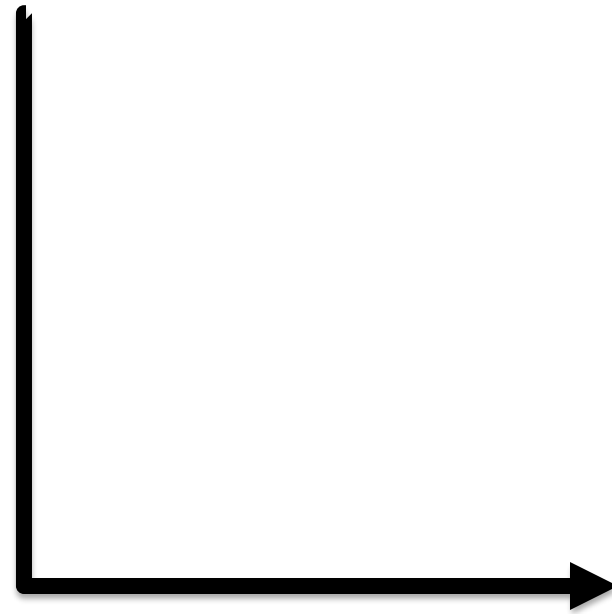
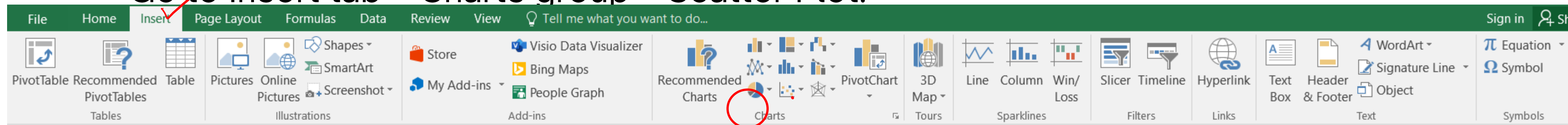
ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	4755969.265	4755969	3332.98443	5.90161E-14
Residual	10	14269.40139	1426.94		
Total	11	4770238.667			

Solution



Step -7

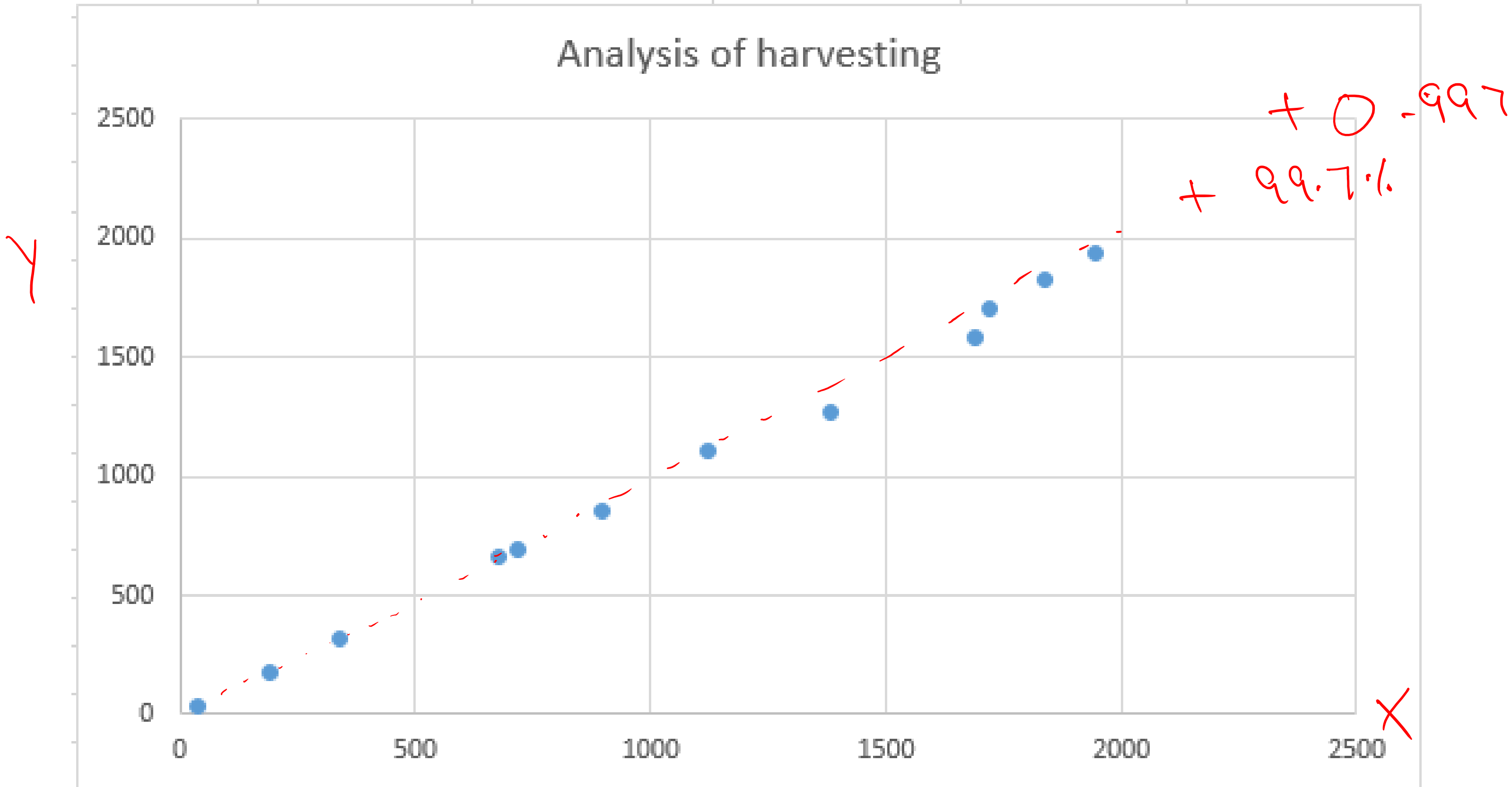
- Select the two variable columns of your data, including the headers.
- Go to ~~Insert~~ Insert tab > Charts group > Scatter Plot.



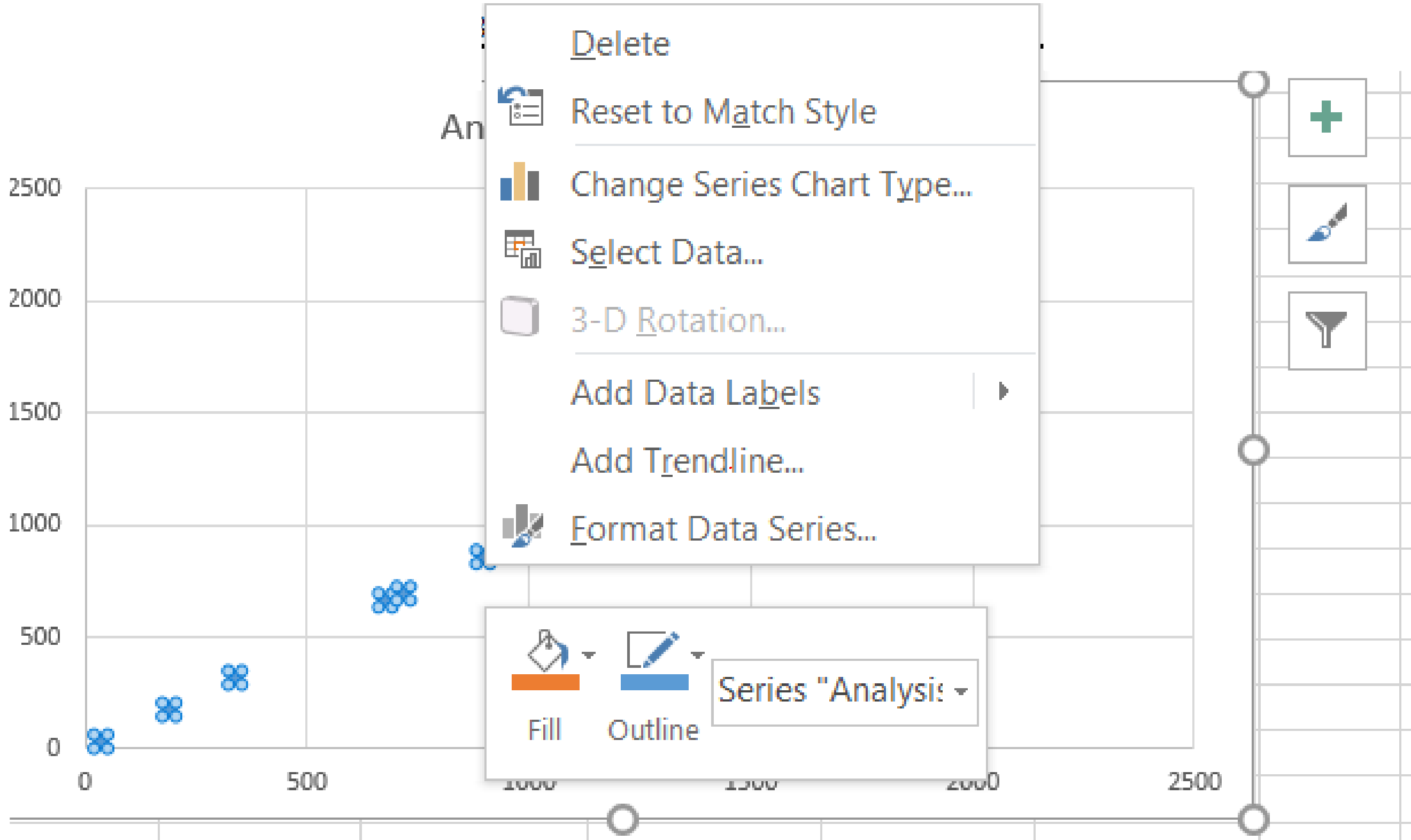
Solution



ideas to products
IMAGINEERING
LAB | IIT KANPUR



Solution



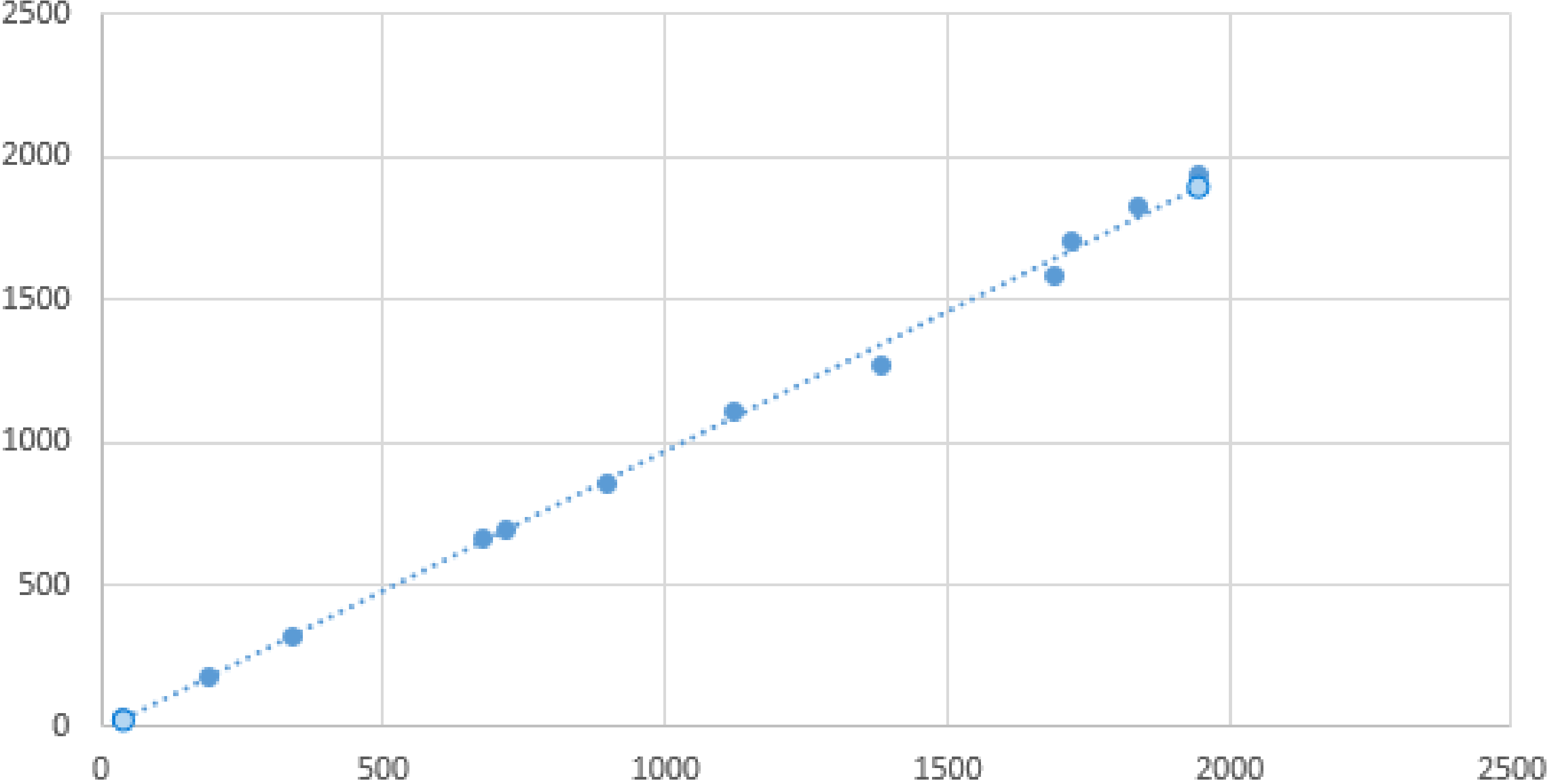
Solution



ideas to products
IMAGINEERING
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Analysis of harvesting



Thank You

