

ASSIGNMENT

Course Code	OMC451B
Course Name	Personal Finance
Programme	B. Tech.
Department	Computer Science & Engineering
Faculty	Faculty of Engineering & Technology

Name of the Student	Kaushal Vashisth
Reg. No	18ETCS002147
Semester/Year	7 th semester / 2018 batch
Course Leader/s	N. Suresh

Declaration Sheet			
Student Name	Kaushal Vashisth		
Reg. No	18ETCS002147		
Programme	B. Tech.	Semester/Year	7 th sem /2018 batch
Course Code	OMC451B		
Course Title	Personal Finance		
Course Date		to	
Course Leader	N. Suresh		
<p>Declaration</p> <p>The assignment submitted herewith is a result of my own investigations and that I have conformed to the guidelines against plagiarism as laid out in the Student Handbook. All sections of the text and results, which have been obtained from other sources, are fully referenced. I understand that cheating and plagiarism constitute a breach of university regulations and will be dealt with accordingly.</p>			
Signature of the Student		Date	
Submission date stamp (by Examination & Assessment Section)			
Signature of the Course Leader and date		Signature of the Reviewer and date	

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Assessment (CE + SEE)

Reg.No.	18ETCS002147	Name of the Student	Kaushal Vashisth
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Component -**1:**

Sections	Marking Scheme		Marks		
			Max Marks		
Part-A (CO1, CO3, CO5)		Prepare Personal Budget for the period of five years from 2022-2027 with the details assuming an income increment of 5-10% for each year which should include			
	A.1	Plan for Unexpected Expenditure, Fixed Expenses and Variable Expenses	5		
	A.2	Plan for Savings and Investments for retirement	5		
	A.3	Plan for Health and Property Insurance	5		
	A.4	Conclusion of the study with stance and justification	3		
		Part-A, Max Marks		18	
Part-B (CO2)		Prepare monthly Amortisation schedule for loan assuming rate of interest for			
	B.1	Short term/Medium for 1-6 Years	5		
	B.2	Long term for 10-15 years	5		
	B.3	Conclusion of the study with stance and justification	2		
		Part-B, Max Marks		12	
Part-C (CO4)	C.1	Select two stocks of your choice listed in National stock exchange from different sector and collect previous fiveyear monthly data of share prices of selected stock and corresponding index data.	6		
	C.2	Determine Systematic and Unsystematic risks of each stock	8		
	C.3	Determine the Expected return of the stocks using CAPM Model assuming risk free return as 6%.	4		
	C.4	Conclusion of the study with stance and justification	2		
		Part-C, Max Marks		20	
		Total Component 1 (CE)		50	

Component - 2: Examination			
Examination	Max Marks	First Examiner Marks	Second Examiner Marks
SEE	50		
SEE marks reduced to 50 Marks			

Component-1 (CE)Total 50			Pass		Fail	
Component-2: SE Examination - 50			Pass		Fail	
Course Marks (Max 100)			Pass		Fail	
IMPORTANT: 1. Component 1 and 2 total marks have to be rounded off to the next higher integer and entered in the above fields. 2. A minimum of 40% required for a pass in both components.						
Signature of Course Leader			Signature of Student			

Question No. 1

Prepare Personal Budget for the period of five years from 2022-2027 with the details assuming an income increment of 5-10% for each year.

Solution to Question No. 1:

Process of creating personal budget can be followed as follows:

Step 1: Note your net income. The first step in creating a budget is to identify the amount of money you have coming in.

Step 2: Track you're spending. ...

Step 3: Set your goals. ...

Step 4: Make a plan. ...

Step 5: Adjust your habits if necessary. ...

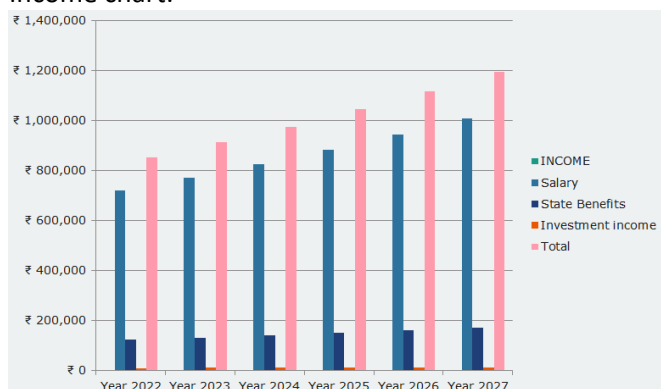
Step 6: Keep checking in.

For this personal budget we are using income increment of 7%.

Income estimation:

	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Total	Average
INCOME								
Salary	₹ 720,000	₹ 770,400	₹ 824,328	₹ 882,031	₹ 943,773	₹ 1,009,837	₹ 5,150,369	₹ 858,395
State Benefits	₹ 123,000	₹ 131,610	₹ 140,823	₹ 150,680	₹ 161,228	₹ 172,514	₹ 879,855	₹ 146,642
Investment income	₹ 10,000	₹ 10,500	₹ 11,025	₹ 11,576	₹ 12,155	₹ 12,763	₹ 68,019	₹ 11,337
Total	₹ 853,000	₹ 912,510	₹ 976,176	₹ 1,044,287	₹ 1,117,156	₹ 1,195,114	₹ 6,098,243	₹ 1,016,374

Income chart:



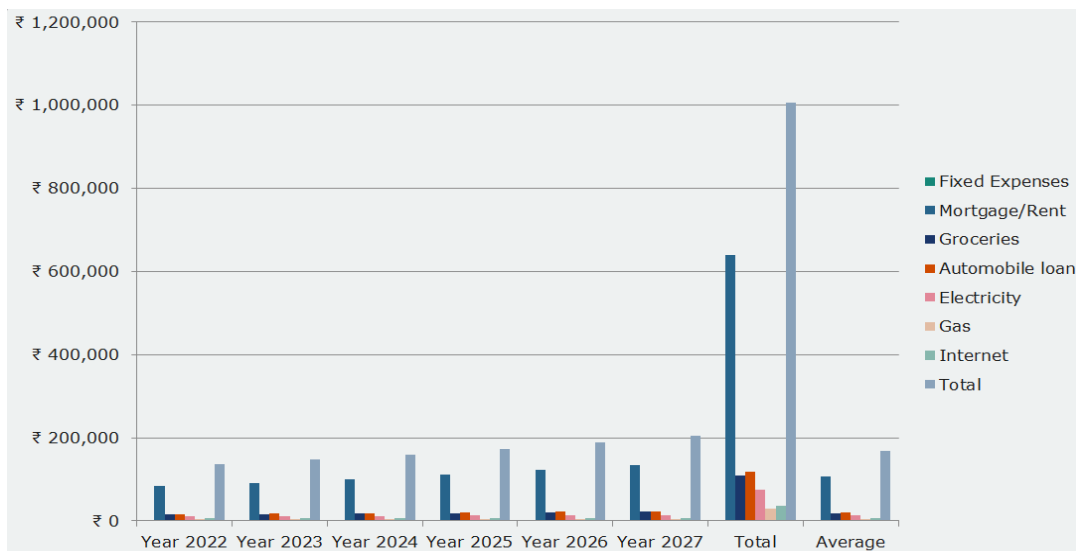
A.1 Plan for Unexpected Expenditure, Fixed Expenses and Variable Expenses

Plan for Fixed expenses:

These are the expenses you have that don't change month-to-month. Your mortgage or rent, car payment, and insurance are examples of fixed expenses. They may vary slightly from year-to-year (say, a rent increase) but overall you can count on them to stay the same for at least a year at a time. That's why we have shown

Yearly Budget to handle fixed expenses:

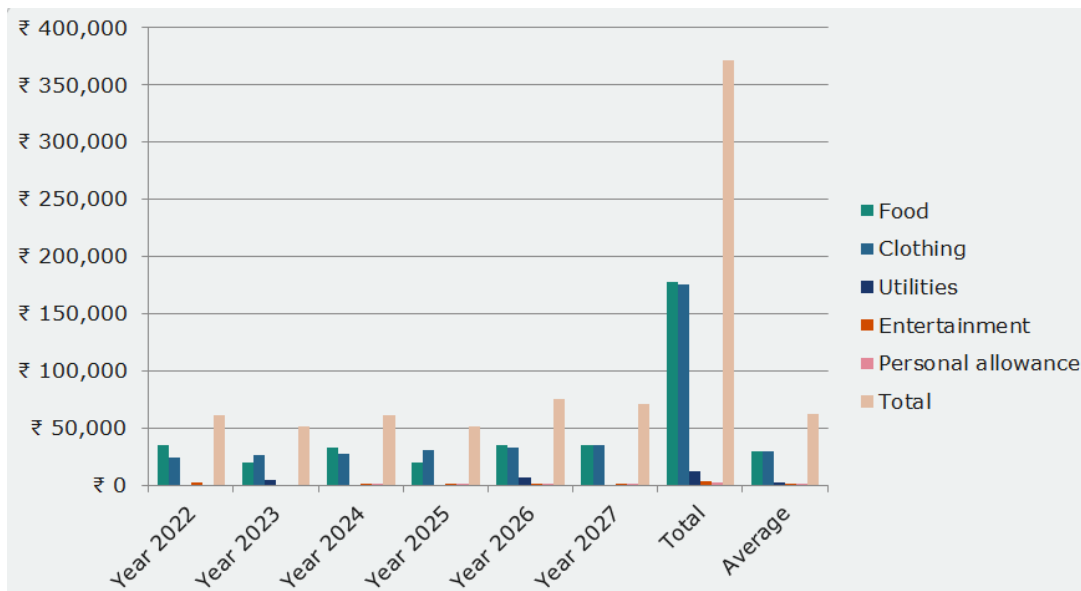
	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Total	Average
Fixed Expenses								
Mortgage/Rent	₹ 83,000	₹ 91,300	₹ 100,430	₹ 110,473	₹ 121,520	₹ 133,672	₹ 640,396	₹ 106,733
Groceries	₹ 15,000	₹ 16,200	₹ 17,496	₹ 18,896	₹ 20,407	₹ 22,040	₹ 110,039	₹ 18,340
Automobile loan	₹ 16,000	₹ 17,280	₹ 18,662	₹ 20,155	₹ 21,768	₹ 23,509	₹ 117,375	₹ 19,562
Electricity	₹ 11,000	₹ 11,550	₹ 12,128	₹ 12,734	₹ 13,371	₹ 14,039	₹ 74,821	₹ 12,470
Gas	₹ 4,500	₹ 4,590	₹ 4,682	₹ 4,775	₹ 4,871	₹ 4,968	₹ 28,387	₹ 4,731
Internet	₹ 6,000	₹ 6,000	₹ 6,000	₹ 6,000	₹ 6,000	₹ 6,000	₹ 36,000	₹ 6,000
Total	₹ 135,500	₹ 146,920	₹ 159,398	₹ 173,033	₹ 187,937	₹ 204,229	₹ 1,007,017	₹ 167,836

Yearly fixed expenses bar graph:Plan for Variable expenses:

Just as the name says, these are your expenses that will vary month-to-month and are probably the largest spending category. Variable expenses include such things as groceries, Food, utilities, entertainment expenses, and clothing. By keeping track of these expenses over time, you can get a better idea of how much you're spending each month and plan accordingly. Utilities can become a fixed expense if your service provider offers an "equalizer" plan. These plans average your usage over time and charge the same each month, rather than spiking during times of increased usage (think summer AC bills in hot climates).

Yearly Budget to handle Variable expenses:

Variable expenses	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Total	Average
Food	₹ 35,000	₹ 20,000	₹ 33,000	₹ 20,000	₹ 35,000	₹ 35,000	₹ 178,000	₹ 29,667
Clothing	₹ 24,000	₹ 25,920	₹ 27,994	₹ 30,233	₹ 32,652	₹ 35,264	₹ 176,062	₹ 29,344
Utilities	₹ 0	₹ 5,000	₹ 0	₹ 0	₹ 7,000	₹ 0	₹ 12,000	₹ 2,000
Entertainment	₹ 2,400	₹ 0	₹ 230	₹ 67	₹ 70	₹ 880	₹ 3,647	₹ 608
Personal allowance	₹ 0	₹ 0	₹ 400	₹ 900	₹ 450	₹ 320	₹ 2,070	₹ 345
Total	₹ 61,400	₹ 50,920	₹ 61,624	₹ 51,200	₹ 75,172	₹ 71,464	₹ 371,779	₹ 61,963

Yearly Variable expenses bar graph:Unexpected expenses:

Your emergency fund should be used for expenses that fall outside the categories of annual bills, irregular maintenance, or predictable health costs. Truly unexpected expenses could be:

- Living expenses for several months after you lose your job
- Unusual medical bills that health insurance doesn't cover
- Plane tickets to attend an unexpected funeral

These expenses are not only irregular and unforeseen; they are related to unexpected or once-in-a-lifetime events, rather than more common activities.

Plan for Unexpected expenses:

When you plan your budget to include annual bills and irregular maintenance, you are able to save the money in your emergency fund for truly unexpected expenses.

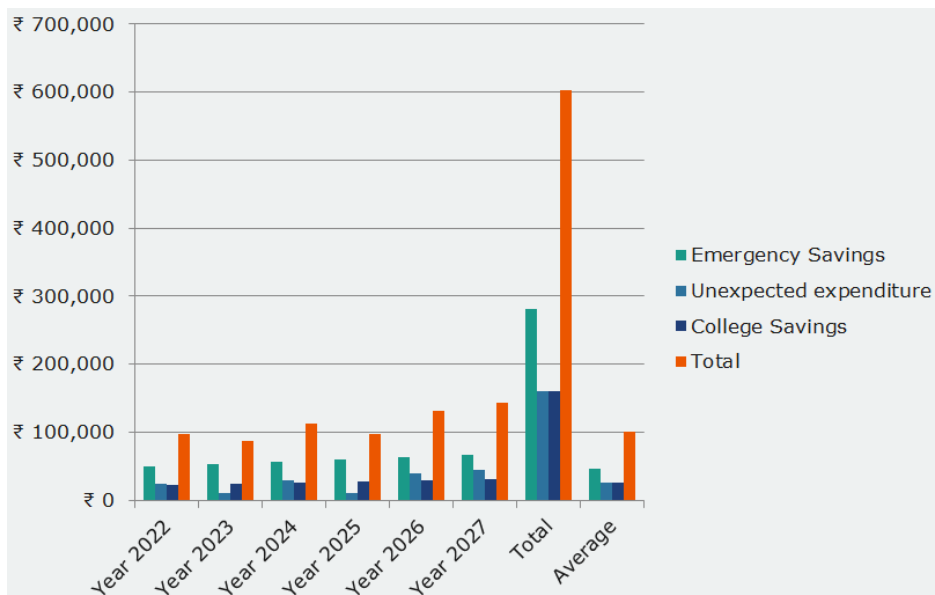
At a minimum, you should have an emergency fund that can cover three to six months of:

- Rent or mortgage payments
- Utilities
- Emergency savings
- College savings
- Prescriptions

However, just because you have this amount set aside doesn't mean you should stop saving. If your monthly budget is set up to continue adding a small amount per month into your emergency savings, you will be able to plan and pay for unexpected expenses that come your way without falling into debt or missing important bills.

Yearly Budget to handle unexpected expenses:

Unexpected expenses and savings	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Total	Average
Emergency Savings	₹ 50,000	₹ 53,000	₹ 56,180	₹ 59,551	₹ 63,124	₹ 66,911	₹ 281,855	₹ 46,976
Unexpected expenditure	₹ 25,000	₹ 10,000	₹ 30,000	₹ 10,000	₹ 40,000	₹ 45,000	₹ 160,000	₹ 26,667
College Savings	₹ 23,000	₹ 24,380	₹ 25,843	₹ 27,393	₹ 29,037	₹ 30,779	₹ 160,432	₹ 26,739
Total	₹ 98,000	₹ 87,380	₹ 112,023	₹ 96,944	₹ 132,161	₹ 142,690	₹ 602,287	₹ 100,381

Yearly unexpected expenses bar graph:**A.2 Plan for Savings and Investments for retirement**

Several retirement plans help in accumulating a considerable sum for your retired life. Some of them are listed below:

National Pension System

National Pension System (NPS) is a government scheme which intends to provide social security to the working class. Employees working in the public, government, and private sectors can invest in this scheme. Moreover, even those employed in the unorganised sector can also invest in NPS. Under this scheme, the employees will invest in a pension account at regular intervals.

Public Provident Fund

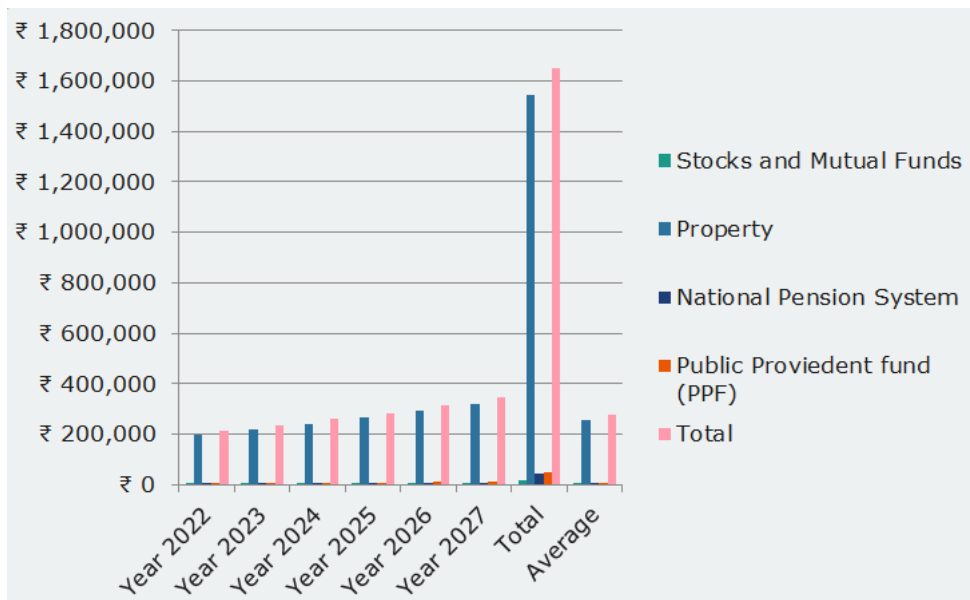
Public Provident Fund (PPF) is a government savings scheme covered under Section 80C of the Income Tax Act, 1961. You can save up to Rs 46,800 a year in taxes by investing in PPF. You can invest up to Rs 1,50,000 a year, and these accounts come with a lock-in period of 15 years. Investing in PPF is an excellent way of planning your retirement as it offers an attractive rate of return.

Mutual Funds

Mutual funds are one of the best private schemes to plan your retirement. These are capable of offering returns in the range of 12% to 15% a year. Also, when you invest with a long-term horizon, you will unleash the power of compounding. Since retirement planning is done with a long-term horizon, you can initially invest aggressively in equity funds and then switch your investments to debt funds as you near your retirement. Doing this will ensure that you have accumulated a considerable sum on which you can fall back in your retired life.

Yearly Budget for retirement savings:

Savings and Investments for retirement	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Total	Average
Stocks and Mutual Funds	₹ 2,000	₹ 2,200	₹ 2,420	₹ 2,662	₹ 2,928	₹ 3,221	₹ 15,431	₹ 2,572
Property	₹ 200,000	₹ 220,000	₹ 242,000	₹ 266,200	₹ 292,820	₹ 322,102	₹ 1,543,122	₹ 257,187
National Pension System	₹ 5,400	₹ 5,940	₹ 6,534	₹ 7,187	₹ 7,906	₹ 8,697	₹ 41,664	₹ 6,944
Public Provident fund (PPF)	₹ 6,600	₹ 7,260	₹ 7,986	₹ 8,785	₹ 9,663	₹ 10,629	₹ 50,923	₹ 8,487
Total	₹ 214,000	₹ 235,400	₹ 258,940	₹ 284,834	₹ 313,317	₹ 344,649	₹ 1,651,141	₹ 275,190

Yearly budget for retirement bar graph:**A.3 Plan for Health Insurance**

Health insurance provides financial protection in case you have a serious accident or illness. For example, a broken leg can cost up to \$7,500. Health coverage can help protect you from high, unexpected costs.

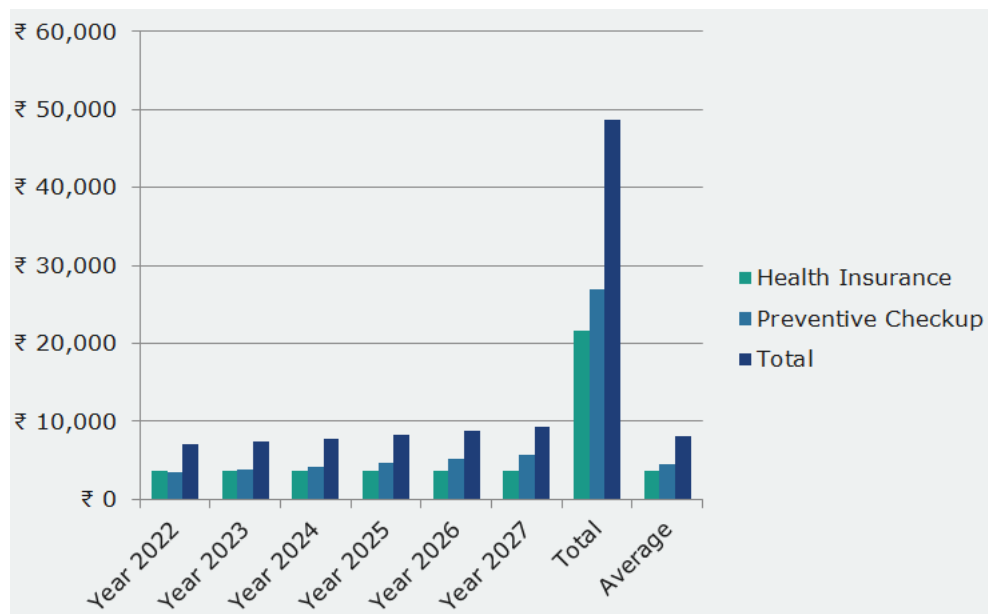
With Marketplace coverage, you'll get access to preventive services — like shots and screening tests — at no cost to you. Getting recommended preventive services is a key step to good health and well-being.

When you apply for insurance using the Health Insurance Marketplace, you'll find out if you qualify for savings that can make insurance less expensive. Before you apply, select your household size, state, and income range to see if you may qualify for financial help.

Budget for Health insurance:

Health Insurance	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Total	Average
Health Insurance	₹ 3,600	₹ 3,600	₹ 3,600	₹ 3,600	₹ 3,600	₹ 3,600	₹ 21,600	₹ 3,600
Preventive Checkup	₹ 3,500	₹ 3,850	₹ 4,235	₹ 4,659	₹ 5,124	₹ 5,637	₹ 27,005	₹ 4,501
Total	₹ 7,100	₹ 7,450	₹ 7,835	₹ 8,259	₹ 8,724	₹ 9,237	₹ 48,605	₹ 8,101

Yearly Bar chart for Health insurance:



A.4 Conclusion of the study with stance and justification

Importance of building budget:

A budget is a plan for using money to meet wants and needs. Having a budget is necessary for successful financial planning. By using a budget, you will learn how to live within your income and how to spend your money wisely. You will also develop good money management skills that will help you reach your financial goals.

Full Budget is shown below with 7% increment in income:

1	Personal 6 year Budget (income increment of 7%)								
2		Year 2022	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Total	Average
3	INCOME								
4	Salary	₹ 720,000	₹ 770,400	₹ 824,328	₹ 882,031	₹ 943,773	₹ 1,009,837	₹ 5,150,369	₹ 858,395
5	State Benefits	₹ 123,000	₹ 131,610	₹ 140,823	₹ 150,680	₹ 161,228	₹ 172,514	₹ 879,855	₹ 146,642
6	Investment income	₹ 10,000	₹ 10,500	₹ 11,025	₹ 11,576	₹ 12,155	₹ 12,763	₹ 68,019	₹ 11,337
7	Total	₹ 853,000	₹ 912,510	₹ 976,176	₹ 1,044,287	₹ 1,117,156	₹ 1,195,114	₹ 6,098,243	₹ 1,016,374
8									
9	Fixed Expenses	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Total	Average
10									
11	Mortgage/Rent	₹ 83,000	₹ 91,300	₹ 100,430	₹ 110,473	₹ 121,520	₹ 133,672	₹ 640,396	₹ 106,733
12	Groceries	₹ 15,000	₹ 16,200	₹ 17,496	₹ 18,896	₹ 20,407	₹ 22,040	₹ 110,039	₹ 18,340
13	Automobile loan	₹ 16,000	₹ 17,280	₹ 18,662	₹ 20,155	₹ 21,768	₹ 23,509	₹ 117,375	₹ 19,562
14	Electricity	₹ 11,000	₹ 11,550	₹ 12,128	₹ 12,734	₹ 13,371	₹ 14,039	₹ 74,821	₹ 12,470
15	Gas	₹ 4,500	₹ 4,590	₹ 4,682	₹ 4,775	₹ 4,871	₹ 4,968	₹ 28,387	₹ 4,731
16	Internet	₹ 6,000	₹ 6,000	₹ 6,000	₹ 6,000	₹ 6,000	₹ 6,000	₹ 36,000	₹ 6,000
17	Total	₹ 135,500	₹ 146,920	₹ 159,398	₹ 173,033	₹ 187,937	₹ 204,229	₹ 1,007,017	₹ 167,836
18									
19	Variable expences	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Total	Average
20	Food	₹ 35,000	₹ 20,000	₹ 33,000	₹ 20,000	₹ 35,000	₹ 35,000	₹ 178,000	₹ 29,667
21	Clothing	₹ 24,000	₹ 25,920	₹ 27,994	₹ 30,233	₹ 32,652	₹ 35,264	₹ 176,062	₹ 29,344
22	Utilities	₹ 0	₹ 5,000	₹ 0	₹ 0	₹ 7,000	₹ 0	₹ 12,000	₹ 2,000
23	Entertainment	₹ 2,400	₹ 0	₹ 230	₹ 67	₹ 70	₹ 880	₹ 3,647	₹ 608
24	Personal allowance	₹ 0	₹ 0	₹ 400	₹ 900	₹ 450	₹ 320	₹ 2,070	₹ 345
25	Total	₹ 61,400	₹ 50,920	₹ 61,624	₹ 51,200	₹ 75,172	₹ 71,464	₹ 371,779	₹ 61,963

26									
27	Health Insurance	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Total	Average
28	Health Insurance	₹ 3,600	₹ 3,600	₹ 3,600	₹ 3,600	₹ 3,600	₹ 3,600	₹ 21,600	₹ 3,600
29	Preventive Checkup	₹ 3,500	₹ 3,850	₹ 4,235	₹ 4,659	₹ 5,124	₹ 5,637	₹ 27,005	₹ 4,501
30	Total	₹ 7,100	₹ 7,450	₹ 7,835	₹ 8,259	₹ 8,724	₹ 9,237	₹ 48,605	₹ 8,101
31									
32	Savings and Investments for retirement	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Total	Average
33	Stocks and Mutual Funds	₹ 2,000	₹ 2,200	₹ 2,420	₹ 2,662	₹ 2,928	₹ 3,221	₹ 15,431	₹ 2,572
34	Property	₹ 200,000	₹ 220,000	₹ 242,000	₹ 266,200	₹ 292,820	₹ 322,102	₹ 1,543,122	₹ 257,187
35	National Pension System	₹ 5,400	₹ 5,940	₹ 6,534	₹ 7,187	₹ 7,906	₹ 8,697	₹ 41,664	₹ 6,944
36	Public Provident fund (PPF)	₹ 6,600	₹ 7,260	₹ 7,986	₹ 8,785	₹ 9,663	₹ 10,629	₹ 50,923	₹ 8,487
37	Total	₹ 214,000	₹ 235,400	₹ 258,940	₹ 284,834	₹ 313,317	₹ 344,649	₹ 1,651,141	₹ 275,190
38									
39	Unexpected expences and savings	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Total	Average
40	Emergency Savings	₹ 50,000	₹ 53,000	₹ 56,180	₹ 59,551	₹ 63,124	₹ 66,911	₹ 281,855	₹ 46,976
41	Unexpected expenditure	₹ 25,000	₹ 10,000	₹ 30,000	₹ 10,000	₹ 40,000	₹ 45,000	₹ 160,000	₹ 26,667
42	College Savings	₹ 23,000	₹ 24,380	₹ 25,843	₹ 27,393	₹ 29,037	₹ 30,779	₹ 160,432	₹ 26,739
43	Total	₹ 98,000	₹ 87,380	₹ 112,023	₹ 96,944	₹ 132,161	₹ 142,690	₹ 602,287	₹ 100,381
44									
45	Savings (Income-Expenses)	₹ 337,000	₹ 384,440	₹ 376,357	₹ 430,017	₹ 399,845	₹ 422,845	₹ 2,417,415	₹ 402,902

From the above budget we can conclude that on an average 4.02 lakh rupees can be saved yearly. Within 6 year a person can save an amount of 24.17 lakh rupees with annual increment of 7%.

Question No. 2

Prepare monthly Amortization schedule for loan assuming rate of interest for

Solution to Question No. 2:

B.1 Short term/Medium for 1-6 Years

Let us consider short term loan for purchasing a laptop the loan amount that we need is 67,000 rupees with interest rate of 6.5%. The loan period taken in consideration is 2 years.

Details of loan are shown below:

Loan Details	
Loan amount	₹ 67,000.00
Annual interest rate	6.50%
Loan period in years	1
Start date of loan	07-12-21

Details of payment are shown below:

Pmt No.	Payment Date	Beginning Balance	Payment	Principal	Interest	Ending Balance
1	07-01-22	₹ 67,000.00	₹ 5,781.86	₹ 5,418.94	₹ 362.92	₹ 61,581.06
2	07-02-22	₹ 61,581.06	₹ 5,781.86	₹ 5,448.30	₹ 333.56	₹ 56,132.76
3	07-03-22	₹ 56,132.76	₹ 5,781.86	₹ 5,477.81	₹ 304.05	₹ 50,654.95
4	07-04-22	₹ 50,654.95	₹ 5,781.86	₹ 5,507.48	₹ 274.38	₹ 45,147.47
5	07-05-22	₹ 45,147.47	₹ 5,781.86	₹ 5,537.31	₹ 244.55	₹ 39,610.16
6	07-06-22	₹ 39,610.16	₹ 5,781.86	₹ 5,567.30	₹ 214.56	₹ 34,042.86
7	07-07-22	₹ 34,042.86	₹ 5,781.86	₹ 5,597.46	₹ 184.40	₹ 28,445.40
8	07-08-22	₹ 28,445.40	₹ 5,781.86	₹ 5,627.78	₹ 154.08	₹ 22,817.62
9	07-09-22	₹ 22,817.62	₹ 5,781.86	₹ 5,658.26	₹ 123.60	₹ 17,159.35
10	07-10-22	₹ 17,159.35	₹ 5,781.86	₹ 5,688.91	₹ 92.95	₹ 11,470.44
11	07-11-22	₹ 11,470.44	₹ 5,781.86	₹ 5,719.73	₹ 62.13	₹ 5,750.71
12	07-12-22	₹ 5,750.71	₹ 5,781.86	₹ 5,750.71	₹ 31.15	₹ 0.00

Loan summary:

Loan Summary	
Monthly payment	₹ 5,781.86
Number of payments	12
Total interest	₹ 2,382.32
Total cost of loan	₹ 69,382.32

B.2 Long term for 10-15 years

For long term loan we are considering long term loan to purchase my house.
To buy a house we are taking loan of 28.4 lakhs with interest rate of 8.3%.

The loan details are given below:

Loan Details	
Loan amount	₹ 2,840,000.00
Annual interest rate	8.30%
Loan period in years	10
Start date of loan	07-12-21

Payment details are shown below:

Pmt No.	Payment Date	Beginning Balance	Payment	Principal	Interest	Ending Balance
1	07-01-22	₹ 2,840,000.00	₹ 34,908.88	₹ 15,265.55	₹ 19,643.33	₹ 2,824,734.45
2	07-02-22	₹ 2,824,734.45	₹ 34,908.88	₹ 15,371.13	₹ 19,537.75	₹ 2,809,363.32
3	07-03-22	₹ 2,809,363.32	₹ 34,908.88	₹ 15,477.45	₹ 19,431.43	₹ 2,793,885.87
4	07-04-22	₹ 2,793,885.87	₹ 34,908.88	₹ 15,584.50	₹ 19,324.38	₹ 2,778,301.36
5	07-05-22	₹ 2,778,301.36	₹ 34,908.88	₹ 15,692.30	₹ 19,216.58	₹ 2,762,609.06
6	07-06-22	₹ 2,762,609.06	₹ 34,908.88	₹ 15,800.84	₹ 19,108.05	₹ 2,746,808.23
7	07-07-22	₹ 2,746,808.23	₹ 34,908.88	₹ 15,910.12	₹ 18,998.76	₹ 2,730,898.10
8	07-08-22	₹ 2,730,898.10	₹ 34,908.88	₹ 16,020.17	₹ 18,888.71	₹ 2,714,877.94
9	07-09-22	₹ 2,714,877.94	₹ 34,908.88	₹ 16,130.98	₹ 18,777.91	₹ 2,698,746.96
10	07-10-22	₹ 2,698,746.96	₹ 34,908.88	₹ 16,242.55	₹ 18,666.33	₹ 2,682,504.41
11	07-11-22	₹ 2,682,504.41	₹ 34,908.88	₹ 16,354.89	₹ 18,553.99	₹ 2,666,149.52
12	07-12-22	₹ 2,666,149.52	₹ 34,908.88	₹ 16,468.01	₹ 18,440.87	₹ 2,649,681.51
13	07-01-23	₹ 2,649,681.51	₹ 34,908.88	₹ 16,581.92	₹ 18,326.96	₹ 2,633,099.59
14	07-02-23	₹ 2,633,099.59	₹ 34,908.88	₹ 16,696.61	₹ 18,212.27	₹ 2,616,402.98
15	07-03-23	₹ 2,616,402.98	₹ 34,908.88	₹ 16,812.09	₹ 18,096.79	₹ 2,599,590.88
16	07-04-23	₹ 2,599,590.88	₹ 34,908.88	₹ 16,928.38	₹ 17,980.50	₹ 2,582,662.51
17	07-05-23	₹ 2,582,662.51	₹ 34,908.88	₹ 17,045.47	₹ 17,863.42	₹ 2,565,617.04
18	07-06-23	₹ 2,565,617.04	₹ 34,908.88	₹ 17,163.36	₹ 17,745.52	₹ 2,548,453.68
19	07-07-23	₹ 2,548,453.68	₹ 34,908.88	₹ 17,282.08	₹ 17,626.80	₹ 2,531,171.60
20	07-08-23	₹ 2,531,171.60	₹ 34,908.88	₹ 17,401.61	₹ 17,507.27	₹ 2,513,769.99
21	07-09-23	₹ 2,513,769.99	₹ 34,908.88	₹ 17,521.97	₹ 17,386.91	₹ 2,496,248.02
22	07-10-23	₹ 2,496,248.02	₹ 34,908.88	₹ 17,643.17	₹ 17,265.72	₹ 2,478,604.85
23	07-11-23	₹ 2,478,604.85	₹ 34,908.88	₹ 17,765.20	₹ 17,143.68	₹ 2,460,839.65
24	07-12-23	₹ 2,460,839.65	₹ 34,908.88	₹ 17,888.07	₹ 17,020.81	₹ 2,442,951.58
25	07-01-24	₹ 2,442,951.58	₹ 34,908.88	₹ 18,011.80	₹ 16,897.08	₹ 2,424,939.78

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Continued.....

95	07-11-29	₹ 828,088.60	₹ 34,908.88	₹ 29,181.27	₹ 5,727.61	₹ 798,907.33
96	07-12-29	₹ 798,907.33	₹ 34,908.88	₹ 29,383.11	₹ 5,525.78	₹ 769,524.23
97	07-01-30	₹ 769,524.23	₹ 34,908.88	₹ 29,586.34	₹ 5,322.54	₹ 739,937.89
98	07-02-30	₹ 739,937.89	₹ 34,908.88	₹ 29,790.98	₹ 5,117.90	₹ 710,146.91
99	07-03-30	₹ 710,146.91	₹ 34,908.88	₹ 29,997.03	₹ 4,911.85	₹ 680,149.88
100	07-04-30	₹ 680,149.88	₹ 34,908.88	₹ 30,204.51	₹ 4,704.37	₹ 649,945.37
101	07-05-30	₹ 649,945.37	₹ 34,908.88	₹ 30,413.43	₹ 4,495.46	₹ 619,531.94
102	07-06-30	₹ 619,531.94	₹ 34,908.88	₹ 30,623.79	₹ 4,285.10	₹ 588,908.16
103	07-07-30	₹ 588,908.16	₹ 34,908.88	₹ 30,835.60	₹ 4,073.28	₹ 558,072.56
104	07-08-30	₹ 558,072.56	₹ 34,908.88	₹ 31,048.88	₹ 3,860.00	₹ 527,023.68
105	07-09-30	₹ 527,023.68	₹ 34,908.88	₹ 31,263.63	₹ 3,645.25	₹ 495,760.04
106	07-10-30	₹ 495,760.04	₹ 34,908.88	₹ 31,479.87	₹ 3,429.01	₹ 464,280.17
107	07-11-30	₹ 464,280.17	₹ 34,908.88	₹ 31,697.61	₹ 3,211.27	₹ 432,582.56
108	07-12-30	₹ 432,582.56	₹ 34,908.88	₹ 31,916.85	₹ 2,992.03	₹ 400,665.71
109	07-01-31	₹ 400,665.71	₹ 34,908.88	₹ 32,137.61	₹ 2,771.27	₹ 368,528.10
110	07-02-31	₹ 368,528.10	₹ 34,908.88	₹ 32,359.90	₹ 2,548.99	₹ 336,168.20
111	07-03-31	₹ 336,168.20	₹ 34,908.88	₹ 32,583.72	₹ 2,325.16	₹ 303,584.48
112	07-04-31	₹ 303,584.48	₹ 34,908.88	₹ 32,809.09	₹ 2,099.79	₹ 270,775.40
113	07-05-31	₹ 270,775.40	₹ 34,908.88	₹ 33,036.02	₹ 1,872.86	₹ 237,739.38
114	07-06-31	₹ 237,739.38	₹ 34,908.88	₹ 33,264.52	₹ 1,644.36	₹ 204,474.86
115	07-07-31	₹ 204,474.86	₹ 34,908.88	₹ 33,494.60	₹ 1,414.28	₹ 170,980.26
116	07-08-31	₹ 170,980.26	₹ 34,908.88	₹ 33,726.27	₹ 1,182.61	₹ 137,254.00
117	07-09-31	₹ 137,254.00	₹ 34,908.88	₹ 33,959.54	₹ 949.34	₹ 103,294.45
118	07-10-31	₹ 103,294.45	₹ 34,908.88	₹ 34,194.43	₹ 714.45	₹ 69,100.03
119	07-11-31	₹ 69,100.03	₹ 34,908.88	₹ 34,430.94	₹ 477.94	₹ 34,669.09
120	07-12-31	₹ 34,669.09	₹ 34,908.88	₹ 34,669.09	₹ 239.79	₹ 0.00

Loan summary:

Loan Summary	
Monthly payment	₹ 34,908.88
Number of payments	120
Total interest	₹ 1,349,065.76
Total cost of loan	₹ 4,189,065.76

B.3 Conclusion of the study with stance and justification

Short-term and long-term loans may refer to the time period in which a loan is paid back. Short term loans are generally to be repaid within a few months or a year or so. Long-term loan repayments can last for a few years up to several years (such as 10-15) years.

Short-term loans are generally associated with a need for quick money in small amounts. Examples of these are cash advance loans and loans derived from peer-to-peer lending. Long-term loans are generally required for larger amounts or for dealing with bigger transactions such as a home purchase loan.

Some loans can either be short term loans or long terms loans, or somewhere in-between. An example of this is with car loans, which can either be for larger amounts or smaller amounts depending on the arrangement.

In the above examples,

For short term loan of 1 year we need to pay total interest of 2382 rupees .

While in our long term loan for 10 years we need to pay 13.49 lakh rupees.

In short term loan our initial loan amount was 67000 rupees but in our long term loan our initial loan amount was 28.4 lakhs.

Question No. 3

Prepare Personal Budget for the period of five years from 2022-2027 with the details assuming an income increment of 5-10% for each year which should include

Solution to Question No. 3:

C.1 Select two stocks of your choice listed in National stock exchange from different sector and collect previous five-year monthly data of share prices of selected stock and corresponding index data.

1)

Maruti Suzuki India Limited (MARUTI.NS)



NSE - NSE Real Time Price. Currency in INR

☆ Add to watchlist

7,234.60 +191.75 (+2.72%)

As of 01:21PM IST. Market open.

[Summary](#) [Chart](#) [Conversations](#) [Statistics](#) [Historical Data](#) [Profile](#) [Financials](#) [Analysis](#) [Options](#) [Holders](#) [Sustainability](#)

Time Period: Dec 07, 2016 - Dec 07, 2021 ▾

Show: Historical Prices ▾

Frequency: Monthly ▾

Apply

Currency in INR

↓ Download

Date	Open	High	Low	Close*	Adj Close**	Volume
Dec 01, 2021	7,191.00	7,380.00	7,021.00	7,042.85	7,042.85	3,501,461
Nov 01, 2021	7,401.00	8,368.00	6,990.70	7,067.80	7,067.80	18,121,227

2)

Tata Motors Limited (TATAMOTORS.NS)

NSE - NSE Real Time Price. Currency in INR

[★ Add to watchlist](#)**478.95** **+11.75** **(+2.51%)**

As of 01:22PM IST. Market open.

Summary[Chart](#)[Conversations](#)[Statistics](#)[Historical Data](#)[Profile](#)[Financials](#)[Analysis](#)[Options](#)[Holders](#)[Sustainability](#)

Previous Close	467.20	Market Cap	1.719T
Open	476.85	Beta (5Y Monthly)	2.09
Bid	478.60 x 0	PE Ratio (TTM)	N/A
Ask	478.95 x 0	EPS (TTM)	-36.99
Day's Range	471.00 - 479.00	Earnings Date	N/A
52 Week Range	156.70 - 536.70	Forward Dividend & Yield	N/A (N/A)
Volume	12,240,874	Ex-Dividend Date	Jul 18, 2016
Avg. Volume	43,095,308	1y Target Est	N/A

**C.2 Determine Systematic and Unsystematic risks of each stock**

Systematic risk refers to the risk inherent to the entire market or market segment. Systematic risk, also known as “undiversifiable risk,” “volatility” or “market risk,” affects the overall market, not just a particular stock or industry.

- Systematic risk is inherent to the market as a whole, reflecting the impact of economic, geopolitical, and financial factors.
- This type of risk is distinguished from unsystematic risk, which impacts a specific industry or security.

Unsystematic risk is the risk that is unique to a specific company or industry. It's also known as nonsystematic risk, specific risk, diversifiable risk, or residual risk. In the context of an investment portfolio, unsystematic risk can be reduced through diversification—while systematic risk is the risk that's inherent in the market.

- Unsystematic risk, or company-specific risk, is a risk associated with a particular investment.
- Unsystematic risk can be mitigated through diversification, and so is also known as diversifiable risk.

1	Date	Nifty 50	% change nifty	Tata motors	% change Tata motors	Maruti Suzuki	% change Maruti Suzuki
2	01-01-17	8561.299805		523.549988		5568.995605	
3	01-02-17	8879.599609	3.72%	456.75	-12.76%	5595.686523	0.48%
4	01-03-17	9173.75	3.31%	465.850006	1.99%	5683.743652	1.57%
5	01-04-17	9304.049805	1.42%	458.899994	-1.49%	6164.79834	8.46%
6	01-05-17	9621.25	3.41%	476.149994	3.76%	6813.084961	10.52%
7	01-06-17	9520.900391	-1.04%	432.549988	-9.16%	6819.321777	0.09%
8	01-07-17	10077.09961	5.84%	444.600006	2.79%	7322.389648	7.38%
9	01-08-17	9917.900391	-1.58%	376.549988	-15.31%	7275.384766	-0.64%
10	01-09-17	9788.599609	-1.30%	401.5	6.63%	7613.349609	4.65%
11	01-10-17	10335.29981	5.59%	428.399994	6.70%	7835.741699	2.92%
12	01-11-17	10226.54981	-1.05%	404.149994	-5.66%	8205.854492	4.72%
13	01-12-17	10530.7002	2.97%	431.850006	6.85%	9284.607422	13.15%
14	01-01-18	11027.7002	4.72%	399.5	-7.49%	9074.8125	-2.26%
15	01-02-18	10492.84961	-4.85%	369.899994	-7.41%	8446.1875	-6.93%
16	01-03-18	10113.7002	-3.61%	326.850006	-11.64%	8455.873047	0.11%
17	01-04-18	10739.34961	6.19%	340.399994	4.15%	8411.833984	-0.52%
18	01-05-18	10736.15039	-0.03%	282.5	-17.01%	8146.785156	-3.15%
19	01-06-18	10714.29981	-0.20%	269.299988	-4.67%	8421.99707	3.38%
20	01-07-18	11356.5	5.99%	264.100006	-1.93%	9085.166992	7.87%
21	01-08-18	11680.5	2.85%	267.5	1.29%	8680.412109	-4.46%
22	01-09-18	10930.4502	-6.42%	223.699997	-16.37%	7136.760742	-17.78%
23	01-10-18	10386.59961	-4.98%	179.100006	-19.94%	6426.23584	-9.96%
24	01-11-18	10876.75	4.72%	171.949997	-3.99%	7441.395996	15.80%
25	01-12-18	10862.54981	-0.13%	172.699997	0.44%	7250.932129	-2.56%
26	01-01-19	10830.9502	-0.29%	181.199997	4.92%	6450.274414	-11.04%
27	01-02-19	10792.5	-0.36%	177.449997	-2.07%	6633.405762	2.84%
28	01-03-19	11623.90039	7.70%	174.25	-1.80%	6480.771973	-2.30%

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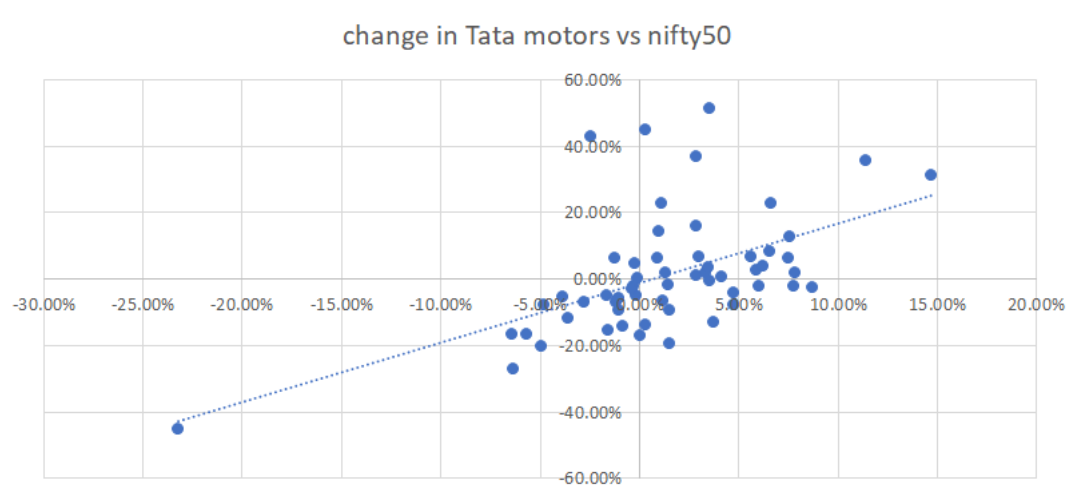
56	01-07-21	15763.04981	0.26%	293.950012	-13.44%	6933.493652	-7.16%
57	01-08-21	17132.19922	8.69%	287.299988	-2.26%	6802.727051	-1.89%
58	01-09-21	17618.15039	2.84%	333.350006	16.03%	7338.049805	7.87%
59	01-10-21	17671.65039	0.30%	483.700012	45.10%	7482.399902	1.97%
60	01-11-21	16983.19922	-3.90%	458.600006	-5.19%	7067.799805	-5.54%
61	01-12-21	17196.69922	1.26%	467.200012	1.88%	7042.850098	-0.35%
62							
63		monthly Nifty	annual Nifty	monthly Tata motors	annual Tata moto	monthly Maruti suzuki	annual Maruti suzuki
64		mean	1.34%	16.08%	1.26%	15.06%	0.80%
65		variance	0.293%	3.52%	3.095%	37.14%	0.780%
66							
67		Beta Tata motors	0.974738654				
68		beta Maruti suzuki	1.163610196				
69							
70							

TOTAL RISK = UNSYSTEMATIC RISK + SYSTEMATIC RISK	risk free rate (rf)= 6%
SYSTEMATIC RISK = BETA^2 * VARIANCE OF MARKET	RA = RF + (RM-RF)BETA

Tata motors sys risk =	3.34%
Tata motors unsys risk =	33.80%
Maruti suzuki sys risk =	4.76%
Maruti suzuki unsys risk =	4.61%

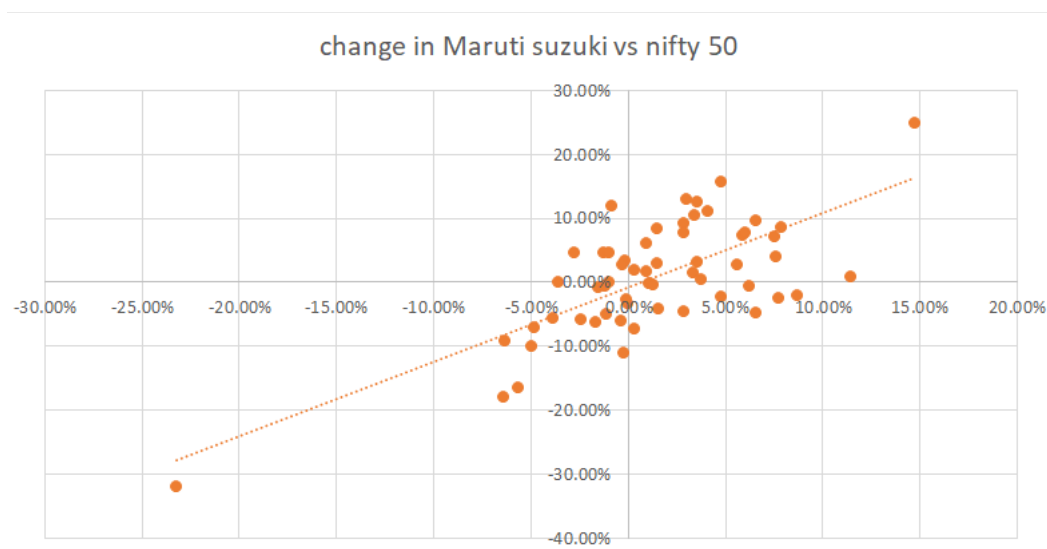
Tata motors summary output:

1	Tata SUMMARY OUTPUT								
2									
3	Regression Statistics								
4	Multiple R	0.550456488							
5	R Square	0.303002346							
6	Adjusted R Square	0.290774317							
7	Standard Error	0.148162981							
8	Observations	59							
9									
10	ANOVA								
11		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>significance F</i>			
12	Regression	1	0.543962476	0.543962	24.77933	6.279E-06			
13	Residual	57	1.251279322	0.021952					
14	Total	58	1.795241799						
15									
16		<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 95.0%</i>	<i>Upper 95.0%</i>
17	Intercept	-0.011419136	0.019881138	-0.57437	0.567977	-0.0512304	0.028392156	-0.0512304	0.028392156
18	X Variable 1	1.789333402	0.359456635	4.977884	6.28E-06	1.0695339	2.509132898	1.06953391	2.509132898
19									
20									
21									



Maruti Suzuki summary output:

1	MARUTI SUZUKI SUMMARY OUTPUT						
2							
3	<i>Regression Statistics</i>						
4	Multiple R	0.7128839					
5	R Square	0.5082035					
6	Adjusted R Square	0.4995755					
7	Standard Error	0.0624938					
8	Observations	59					
9							
10	<i>ANOVA</i>						
11		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
12	Regression	1	0.230038984	0.230039	58.9015943	2.38837E-10	
13	Residual	57	0.222612345	0.003905			
14	Total	58	0.452651329				
15							
16		<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
17	Intercept	-0.0075738	0.008385689	-0.90319	0.37022817	-0.024365892	0.009218
18	X Variable	1.1636102	0.151615636	7.674737	2.3884E-10	0.860005121	1.467215
19							



C.3 Determine the Expected return of the stocks using CAPM Model assuming risk free return as 6%.

The capital asset pricing model (CAPM) is a tool for figuring out risk of stock profit or losses (called returns).

It makes an assumption, which is that investors care only about two things: the average returns of stocks over, for example, ten years, and the volatility of annual returns around that average during the same period.

The main result of the model is that the return of a stock can be broken down in the sum of two things: a risk-free rate and a risk premium. This risk premium can be seen as the product of two things: a measure of the risk of the stock (called the "beta") and the average reward for risk in the market (the "equity risk premium", which is the return of the market over and above the risk-free rate).

Formula



$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

$E(R_i)$ = capital asset expected return

R_f = risk-free rate of interest

β_i = sensitivity

$E(R_m)$ = expected return of the market

Results:

risk free rate (rf)= 6%	
$RA = RF + (RM - RF)BETA$	
EXPECTED RETURN Tata motors	15.669%
EXPECTED RETURN Maruti suzuki	18.705%

Expected return of stocks of tata motors and maruti Suzuki is shown below:

C.4 Conclusion of the study with stance and justification

We can conclude that all systematic and unsystematic risks have been calculated accurately.

We should know that:

Systematic risk is uncontrollable in nature since a large scale, and multiple factors are involved. Whereas, unsystematic risk is controllable as it is restricted to a particular section. Unsystematic risks are caused due to internal factors that can be controlled or reduced in a relatively short time.

Systematic Risk affects many securities in the market due to widespread impact such as interest rate decreases by the Central Bank of a country. In contrast, Unsystematic risk will affect the stock/securities of a particular firm or sector, e.g., the strike caused by the workers of the Cement industry.

