MVP SAMAJ'S

K.T.H.M. COLLEGE, NASHIK-02

(K.R.T. ARTS, B.H. COMMERCE AND A.M.SCIENCE COLLEGE)

A

PROJECT REPORT

ON

"STATISTICAL ANALYSIS OF ONLINE SHOPPING"

Submitted to,

SAVITRIBAI PHULE PUNE UNIVERSITY

In the partial fulfilment of

T.Y.B.Sc.(STATISTICS)

BY

Mr. PATIL BHAGWAN DHUDAKOO

Mr. DIVEKAR VISHAL PRADIP

Mr. MAHAJAN PARESH ANIL

Mr. SHEKADE GANESH NARAYAN

Mr. BHAMARE DHANANJAY SANJAY

Under the guidance of

DR. A. S. PADHYE

K.T.H.M. COLLEGE, NASHIK-02

M.V.P. Samaj's

K. T. H. M. COLLEGE, NASHIK-02

MARCH-2017-18

CERTIFICATE

This is to certify that the project report entitled "**Statistical Analysis of Online Shopping**".

It is a bona fide work carried out by,

1) Patil Bhagwan Dhudakoo
2) Divekar Vishal Pradip
3) Mahajan Paresh Anil
4) Shekade Ganesh Narayan
5) Bhamare Dhananjay Sanjay

Students of T.Y.B.Sc. (Statistics) K.T.H.M.COLLEGE, Nashik-2, for the partial fulfilment of Degree of Graduation of "**Savitribai Phule Pune University**".

Dr. A. S. Padhye
Project Guide

Dr. A. S. Padhye
H.O.D. (Statistics)
K.T.H.M. College, Nashik-02

Date:

Place: Nashik

ACKNOWLEDGEMENT

No endeavour achieves success without the advice and the co-operation of other, the help of whom went a long way while working in this project. I am very happy to present report on "**Statistical Analysis of Online shopping**" which is prepared as part of the final year of graduation in Science.

A project of such a comprehensive coverage could not have materialized without the systematic guidance of our guide and other teachers. I feel greatly delighted in expressing my immense gratitude towards constant encouragement, which greatly helped me in making this project a reality.

I take this opportunity to sincerely thank Dr. A.S. Padhye, Head of the department Of Statistics, K.T.H.M. College, Nashik for her valuable guidance and suggestions. Also I would like to thank all the professors of our department for all possible help.

We would like to express our sincere thanks to our project guide Prof .P.S. Padhye for her valuable guidance, support and motivation given to us whenever needed, without whom it would not have been possible for us to complete this project work.

I would also like to thank all the people who gave their valuable time for filling my questionnaire while collecting the data.

Lastly I want all my project group members and also all my other friends who were ever co-operative to make this project a success.

Thank you everyone!!!

Declaration by The Students

We declare that the project entitled "**Statistical Analysis of Online Shopping**" submitted by us for the partial fulfilment of our Bachelor Degree of Science in Statistics during 2017-2018 is original work.

We further declare that the analysis has been carried out based on the primary data collected through questionnaire by us.

Names of Students:

1. Patil Bhagwan Dhudakoo
2. Divekar Vishal Pradip
3. Mahajan Paresh Anil
4. Shekade Ganesh Narayan
5. Bhamare Dhananjay Sanjay

Date:

Place: Nashik

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Data Collection Of Online Shopping Data

Sr.No.	Age	Gender	Qualification	Occupation	Income	Location	Q.1	Q.2	Q.3	Q.4	Q.5	Q.6	Q.7	Q.8	Q.9	Q.10	Q.11	Q.12	Q.13	Q.14	Q.15
1	2	1	3	2	3	1	1	2	3	4	2,3	1,2	1,3	4	2	1	2	2	3	2	1
2	1	1	3	1	-	1	1	5	2	4	3	2,3	1	1,4	1 (I)	2	1	1	1	3	1
3	2	1	3	2	2	1	1	1	3	1	1	1,2	1,3	2	2	2	1	2	3	5	1
4	2	1	3	2	2	1	1	1	2	4	3	1	1,4	2	2	2	2	1	5	5	1
5	1	1	3	1	-	2	1	5	2	2	3	1,2	1,4	1,3	1 (I)	2	1	1	5	2	1
6	1	1	3	1	-	2	1	1	3	1	3	2	1,2	1	1	2	1	1	5	2	1
7	1	2	2	4	-	1	1	5	4	3	2	2,4	1,3	1,4	2	2	1	2	4	4,5	1
8	2	1	4	3	5	2	1	5	4	4	2	1,2	1	2,4	1 (I)	3	2	1	1,5	1,2	1
9	1	1	2	5	2	2	1	4	2	2	1	1,2	1,3	1,4	1 (I,II)	4	2	2	4	2,3	1
10	1	1	3	1	-	2	1	5	3	4	3	2,3	1	1,4	1(I,IV)	2	1	1	1,4	2,4	1
11	1	1	3	1	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	2	1	1	4	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	1	1	1	2	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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18	3	1	2	2	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	1	1	3	1	-	2	1	1	1	2	3	2,3	1,3	1,4	1 (III)	2	1	1	4	2,5	1
20	2	1	3	2	2	1	1	5	2	3	3	1,2	1,4	1,4	2	2	2	1	5	5	1
21	1	1	2	1	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	1	1	2	1	-	2	1	5	1	4	3	2	1	1,2	1 (I)	4	1	1	4	2	1
23	4	1	1	2	2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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29	4	1	2	3	5	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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31	3	1	3	3	3	1	1	1	3	2	2,3	2	1	1	1(II)	2	2	2	1	5	1
32	2	1	3	2	2	1	1	5	2	3	2	2	1,3	1,3	2	2	1	2	2	4	1
33	2	1	3	4	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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36	1	1	3	1	-	1	1	1	2	4	3	2,3	1	1,4	2	1	2	1	4	5	1
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38	1	1	3	1	-	1	1	5	2	2	3	1,2	1,4	1	1(II)	4	2	1	3	5	1
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40	1	1	3	1	-	1	1	5	4	3	1	2,3	1	4	1(IV)	1	2	2	2	5	1
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94	2	2	3	2	3	2	1	5	4	3	3	2	5	3	2	2	1	2	4,5	2,3	1
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98	3	1	4	2	4	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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120	3	1	1	3	2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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140	1	1	2	2	-	1	1	3	2	1	1	3	1	1	2	2	1	2	2	1	1
141	3	1	2	2	2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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173	1	2	1	4	-	2	1	5	4	4	3	4	1	1	2	2	1	2	4	5	1
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198	2	1	2	2	2	2	1	2	3	2	3	1	1	1	2	2	1	2	4	5	1
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202	3	1	3	5	3	2	1	4	3	4	3	3	1	1	2	1	1	2	2	5	1
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205	3	1	3	3	2	2	1	4	4	4	4	3	2	1	2	2	1	2	2	5	1
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210	1	1	3	1	-	2	1	1	2	4	3	3	1,3	1,2	2	2	1	2	1	3,5	1
211	1	1	3	1	-	2	1	1	1	2	3	3	1,3	1,2	2	1	1	2	1	3	1
212	1	1	2	1	-	2	1	5	4	4	3	6	1	4	1 (II)	3	1	2	1	3	1
213	1	1	3	1	-	2	1	4	4	2	3	3	1,3	1,2	1 (V)	2	1	2	4	3	1
214	1	1	3	1	-	2	1	5	4	2	3	3	1	4	2	2	1	1	2	4	1
215	1	1	2	1	2	2	1	1	1	2	3	1,2	3	1,2	1 (I)	2	1	1	2,4	5	1
216	2	1	2	5	-	2	1	5	4	4	3	2,3	1,2	1,2	2	2	1	1	3	4	1
217	1	2	3	1	-	2	1	1	4	2	3	3	1	1	2	1	1	2	2	5	2
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220	1	1	3	5	1	2	1	5	4	4	3	6	2	1	1 (V)	2	1	1	2	4	1
221	4	1	3	5	1	2	1	5	4	4	3	1,3	1	1	2	1	1	1	4	3	1
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224	3	1	3	5	1	2	1	5	4	4	3	6	1	4	1 (III)	2	1	2	1	5	2
225	3	1	1	5	1	2	1	4	3	3	3	1,3	3,4	1	1 (III)	2	2	1	2	2	1
226	2	1	2	2	2	2	1	4	1	1	1	2	1	2	1	4	2	1	3	1	1
227	3	1	4	2	5	2	1	3	3	1	3	3	1	2	1	2	1	2	3	3	1
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230	2	2	3	2	2	2	1	5	4	3	3	4	2,3	3	1 (III)	2	2	2	4	2	1
231	3	2	2	4	1	1	1	4	2	2	1,3	1,4	1,3	4	2	1	2	1	2	5	1
232	3	1	3	2	2	2	1	3	4	3	1	1	1,4	4	2	3	1	2	4	2	1
233	3	2	4	3	4	2	1	5	4	4	1	5	1	2	2	1	1	1	3	5	1
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235	4	1	4	2	3	2	1	5	4	2	1	5	1	3	2	2	1	2	4	2	1
236	1	1	2	1	-	2	1	4	2	2	3	3	3	1	2	1	1	1	4	5	2
237	4	1	4	2	4	1	1	3	4	4	1	4	1,3	3	2	2	1	1	4	2	1

238	4	1	4	2	5	1	1	5	4	3	1,3	5	4	4	1 (V)	3	2	1	3	5	1
239	4	1	4	2	4	1	1	5	4	1	1	4	1	2	1 (II)	2	1	1	1	5	2
240	1	1	1	5	1	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
241	1	1	2	1	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
242	1	1	1	5	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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244	1	2	2	1	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
245	1	2	2	1	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
246	3	1	3	2	2	2	1	5	4	4	1,3	1,6	1,3	1,3	2	2	1	2	1,4	2,5	1
247	4	1	3	5	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
248	1	2	2	1	-	1	1	4	4	2	3	3,4	1,3	1,2	1 (II)	2	1	1	2,3	1,5	1
249	1	2	2	1	-	1	1	5	4	2	3	3,4	2,3	1,3	2	2	1	1	2,4	2,5	1
250	1	1	2	1	-	2	1	5	4	4	1,3	2,3	1,3	1,2	1 (II)	2	1	1	2,4	2,3	1
251	2	1	2	2	1	2	1	5	2	2	3	6	1,3	1,2	1 (III)	2	1	1	4	5	1
252	1	1	3	3	2	1	1	2	3	4	1,3	1,2	1,3	2	1(V)	2	1	1	3	4	1
253	2	1	3	1	4	2	1	2	2	3	3	3	2	2	1	2	1	1	5	4	1
254	2	1	3	3	2	1	1	2	3	3	1	2	3	2	1	2	1	1	3	3	1
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256	1	1	3	2	1	1	1	5	4	4	3	5	1,3	3	2	2	1	1	3	4	1
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258	1	1	2	1	-	2	1	5	4	4	3	2,3	1,2	4	2	2	1	1	1,3	2	1
259	1	1	3	1	-	2	1	2	4	4	3	2,3	3	3	1 (III)	3	2	1	2	4,5	1
260	1	1	2	1	-	2	1	2	4	3	3	6	1,3	1,2	2	2	1	2	3	1	2
261	1	1	2	1	-	2	1	4	3	4	3	2,3	1,2	1	2	2	1	1	2,4	5	1
262	3	1	3	2	2	2	1	2	4	4	1,3	2,6	1	1	2	2	1	2	4,5	5	1
263	1	1	3	1	1	2	1	5	3	3	1,3	3	1	1,2	2	1	1	2	1,4	2	1
264	1	1	3	1	-	2	1	5	2	4	3	1,2	4,5	1,2	1 (III)	2	1	1	2	4	2
265	1	1	3	1	-	2	1	5	4	4	3	6	3	1,2	2	1	2	1	4	2	1
266	2	1	3	2	1	2	1	2	4	4	1,3	2,3	2	3	2	1	1	1	3	2,4	1
267	1	1	3	3	5	1	1	2	1	2	1	2	3	2	1 (I)	1	2	1	3	1	1
268	2	1	3	3	5	1	1	3	1	2	2	4	1	3	1 (III)	2	1	2	3	1	1
269	1	1	4	3	4	1	1	1	3	2	1	1	4	1	1 (III)	4	1	2	4	2	1
270	1	1	3	2	2	1	1	2	1	2	3	2	1	3	1 (I)	2	2	2	2	4	1
271	1	1	3	2	1	1	1	1	1	4	2	1	2	3	1 (II)	3	1	2	2	1	1
272	1	1	3	2	2	1	1	2	1	2	1	4	3	2	1 (I)	2	2	1	3	2	1
273	1	1	3	3	2	1	1	1	3	4	3	1	1	3	1 (II)	3	1	1	2	3	2
274	1	1	3	3	2	1	1	3	1	2	1,3	3	2	1	2	1	2	1	2	1	1
275	1	1	3	2	1	1	1	2	1	1	3	2	4	2	1 (I)	2	2	2	2	1	1
276	2	1	4	3	3	1	1	2	1	2	1	2	3	2	1 (I)	1	1	2	3	1	2
277	1	1	3	2	1	1	1	2	1	3	4	1	2	2	2	2	1	1	3	4	1

278	1	1	2	1	-	1	1	1	1	2	3	4	1	2	2	3	2	1	4	1	1
279	1	1	3	1	-	1	1	1	3	2	1	2	1	4	1 (II)	3	1	1	4	2	1
280	1	1	3	1	-	2	1	2	1	2	3	2	1	1	1 (IV)	4	2	2	1	2	1
281	1	2	3	1	-	1	1	2	3	2	1	1	2	3	1 (IV)	2	2	1	2	2	2
282	1	2	3	1	-	2	1	1	2	1	2	3	4	1	1 (III)	2	2	2	2	1	1
283	1	2	3	1	-	2	1	1	3	4	3	1	1	3	2	3	1	2	2	3	1
284	1	2	3	1	-	2	1	3	2	4	1	2	3	3	1 (II)	3	1	2	2	2	2
285	1	2	3	3	2	1	1	5	2	1	3,5	2	1	3	1 (II)	3	2	1	2	1	1
286	1	2	3	1	-	1	1	1	2	1	2	3	4	1	1 (V)	2	1	1	2	2	1
287	1	2	3	1	-	1	1	1	4	2	3	2	1	1	2	4	1	2	2	1	1
288	2	1	3	3	3	1	1	3	3	2	3,4	2	1	3	2	3	2	1	1	1	2
289	2	1	3	2	3	1	1	2	2	1	1	2	1	3	1 (IV)	4	2	1	2	1	1
290	2	1	3	2	3	1	1	5	1	2	1	5	3	4	1 (I)	2	1	1	3	4	2
291	2	1	3	2	2	1	1	2	3	4	1	2	3	2	2	2	1	2	1	1	2
292	1	2	3	1	-	2	1	3	2	4	3	3	2	1	1 (III)	2	1	2	4	1	1
293	2	1	3	3	5	1	1	3	4	4	5	1	2	2	1 (II)	1	1	1	3	4	1
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295	1	1	3	2	3	1	1	2	2	1	2	1	2	3	2	2	2	2	1	1	1
296	1	1	3	2	3	1	1	1	1	3	4	1	3	2	1 (III)	4	1	2	1	2	1
297	1	1	3	2	3	1	1	5	1	2	2	5	3	4	1 (I)	2	2	1	2	4	1
298	1	1	3	2	3	1	1	1	2	2	4	3	1	3	2	2	2	1	2	2	2
299	1	1	3	1	-	1	1	3	2	1	2	2	1	3	1 (III)	4	1	2	1	1	1
300	1	1	3	2	1	1	1	1	2	2	1	3	4	1,3	1 (I)	4	1	2	2	1	1
301	2	1	3	2	2	1	1	1	4	3	4	1	1	2	1 (I)	2	1	1	4	3	1
302	1	1	3	2	2	1	1	2	1	3	3	1	2	3	2	1	2	2	3	1	1
303	1	1	3	1	-	1	1	2	1	2	1	2	3	2	1 (III)	1	1	1	5	3	1
304	1	1	3	1	-	1	1	1	3	4	3	1	1	3	1 (II)	3	1	1	2	3	1
305	1	1	3	1	-	1	1	2	4	1	2	3	3	1	2	4	1	1	4,5	2	1
306	1	1	3	1	-	1	1	3	1	2	2	4	1	3	2	2	2	2	3	1	1
307	1	2	3	1	-	1	1	1	3	4	2	1	2	3	1 (III)	3	1	2	1	1	1
308	1	2	3	1	-	2	1	2	1	1	3	1	2	1	1 (II)	2	1	1	2	2	1
309	1	1	3	1	-	2	1	1	2	4	3	1	2	2	1 (I)	3	2	2	4	2	1
310	1	2	3	1	-	2	1	2	1	2	3	2	1	3	2	2	1	2	2	4	1
311	1	1	3	1	-	1	1	1	3	2	4	2	1	3	1 (III)	3	1	2	4	2	2
312	1	1	3	1	-	1	1	3	2	1	2	1	3	1	2	4	1	2	4,5	2	1
313	1	1	3	1	-	2	1	2	1	2	3	2	3	1	1 (III)	2	2	1	4	3	1
314	1	1	3	1	-	1	1	2	1	3	1	2	2	1	2	1	1	1	1	4	1
315	1	1	3	1	-	2	1	2	2	3	4	1	1	2	2	1	1	2	3	4	1
316	1	1	3	1	-	2	1	2	1	1	2	3	4	1	2	4	1	2	3	4	1
317	1	1	3	1	-	1	1	2	2	1	1	2	1	2	1 (IV)	3	2	1	3	3	1

318	4	1	2	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
319	4	1	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
320	4	1	1	5	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
321	4	2	2	4	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
322	3	2	2	4	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
323	1	2	4	1	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
324	1	1	3	1	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325	2	1	4	3	4	1	1	5	4	3	2	1	2	2,4	2	2	2	2	4,5	1,4	2
326	3	2	3	2	1	1	1	5	1	2	3	6	1	1,4	2	4	1	1	2,4	5	2
327	4	1	3	2	3	1	1	4	4	1	1,3	3,6	1,2	1,2	1(II)	4	2	1	1,5	1,4	1
328	3	2	3	4	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
329	3	1	4	3	4	1	1	5	3	4	2,3	1,2	1,3	1,4	1(II)	4	2	1	1,3	1,2	2
330	4	2	2	4	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
331	3	2	3	2	2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
332	4	2	3	4	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
333	4	1	2	3	2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
334	3	1	4	2	3	2	1	5	4	4	1,3	2,3	1,5	1,4	1(I,IV)	3	2	1	1,3	3,5	1
335	4	1	4	3	4	2	1	5	3	2	2	1,2	1,4	4	1(I)	1	2	2	1	1,5	2
336	4	2	1	4	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
337	4	2	3	2	4	1	1	5	3	2	2,3	1,4	1,3	1,2	2	2	1	1	3	5	1
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339	2	2	2	4	1	2	1	2	4	2	3	2,4	1,3	1,2	1(I)	2	2	1	1	1	1
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344	4	1	3	3	3	1	1	3	4	2	2,3	6	1,5	3	2	1	2	2	1	1	1
345	2	1	2	5	1	2	1	4	3	2	3	6	1,2	1,2	2	1	1	1	4	2	1
346	3	2	1	4	1	2	1	5	3	1	3	2,4	2,4	3	1(V)	2	2	1	1	2	1
347	4	2	3	4	1	1	1	5	4	4	3	6	5	3	1(V)	4	2	2	1	1	2
348	4	1	1	5	1	2	1	5	2	2	1,3	2	3	1,2	1(III)	3	2	1	1	1	2
349	1	1	3	1	1	1	1	4	3	1	3	2	2	3	2	2	1	1	2	2	1
350	1	1	2	3	4	1	1	3	4	4	2	2,5	1,3	3	2	1	1	2	1	5	1
351	1	1	2	1	-	2	1	5	4	4	3	2	3	3	1(II)	1	1	1	4	2	1
352	2	1	3	2	2	1	1	2	3	3	2	2	1	2	1(III)	1	1	2	1	1	1
353	1	1	3	1	-	2	1	2	2	3	3	3	1	2	1(I)	2	1	1	1	4	1
354	1	1	2	1	-	2	1	4	3	1	3	2	1	1	1(I)	1	1	1	1	2	1
355	1	1	2	1	-	1	1	1	1	3	2	3	1	2	1(II)	2	1	2	4	3	1
356	3	1	4	2	2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
357	1	1	3	1	-	1	1	2	4	2	3	2	1	3	2	2	1	1	1	2	1

358	2	2	3	5	-	2	1	4	4	4	3	2	5	3	2	2	1	2	3	2	1
359	1	1	2	1	-	1	1	2	4	4	1	2	1	3	2	2	1	2	1	3	2
360	2	2	4	4	-	1	1	5	4	1	3	1,6	2	2	1(I)	2	1	2	2	5	2
361	1	1	3	1	-	1	1	5	4	4	1	3	1	3	2	2	1	2	1	5	1
362	1	2	4	1	-	1	1	5	4	3	1	4	1	4	1(III)	4	1	1	1	2	1
363	2	1	4	1	2	1	1	1	2	1	4	2	3	4	1(II)	2	1	2	4	3	1
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366	2	1	4	2	4	1	1	1	3	4	2	2	1	3	1(I)	2	1	2	1	1	1
367	2	1	4	2	6	1	1	5	4	4	1	2	1	2	1(I)	2	1	2	5	2	2
368	2	1	4	1	3	1	1	2	3	3	3	2	1	3	2	2	1	1	4	3	1
369	2	1	3	2	3	1	1	3	3	3	1	2	3	3	1(I)	2	1	1	1	2	1
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373	1	2	3	5	-	1	1	3	2	3	1,3	2	1	4	2	2	1	1	4	2	1
374	2	1	4	2	5	1	1	3	4	2	2	2	1	4	1(II)	1	1	1	2	1	1
375	2	1	3	1	1	1	1	3	4	4	3	3	1	4	1(I)	2	1	2	5	4	1
376	2	1	1	3	3	1	1	5	4	4	1	2	3	2	1(II)	4	2	2	4	5	1
377	1	1	3	1	-	1	1	5	4	3	3	2	2	2	1(I)	2	1	1	3	3	1
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379	1	1	3	2	1	1	1	5	2	4	3	2	1	3	1(I)	2	1	1	1	2	1
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382	2	2	4	4	-	1	1	2	2	2	3	1	1	4	2	2	1	1	1	1	1
383	2	2	4	2	4	1	1	3	4	4	1	2	3	3	1(II)	2	1	1	2	3	1
384	1	2	3	1	-	1	1	4	2	2	3	1	1	2	1(III)	2	1	1	1	2	1
385	1	1	2	1	-	2	1	5	2	4	1	2	2	4	2	1	1	1	5	3	1
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387	1	1	3	1	-	2	1	2	2	4	3	2	3	2	1(II)	2	1	2	1	3	1
388	1	1	4	2	2	1	1	5	4	3	1	2	3	2	1(II)	4	1	2	4	5	1
389	4	2	4	2	6	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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393	4	1	4	2	4	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
394	3	2	3	3	2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
395	2	1	2	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
396	2	1	2	2	1	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
397	3	2	1	4	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

398	4	1	1	5	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
399	4	2	1	4	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
400	4	2	1	4	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-

INTRODUCTION

This project about online shopping is very helpful where the customers can directly buy the products or items from home through internet connection on mobile. Customers get home delivery when they shop online. This system helps to choose products faster and easier at one place. This system can also help to save time and of travelling to the seller's place.

An online store is a virtual store on the internet where users can browse the catalogue and select products of interest. In the 21st century people are opting online shopping as a need of a hour. The objective of this project is to study online shopping according to following attributes: Age, Income, Area, Education, Occupation

Data are collected through questionnaire and analysed using statistical tools and techniques.

MOTIVATION

Statistics as a subject has been taught to us for three years at graduate level. During this time, we have come to know different application of the subject in copious fields. There has always been an urge to do some real life project applying various statistical tools to get some valid conclusions.

In the final year of our graduation we got this opportunity to do a project of our choice.

We selected the topic "**STATISTICAL ANALYSIS OF ONLINE SHOPPING**" as it is another option to buy or sell products online rather than offline [i.e. market, mall, shopping, etc.] In the 21^{ST} century, people are attached to internet in various manners, and thus online shopping, therefore we thought if we could conclude some prominent conclusion on the best of our knowledge and capability.

To meet our project objective, we analysed data using MS-word, MS-excel, R software etc. The conclusions obtained by us have created interest in our mind and we would be looking forward to work on the same on a larger extent.

ABSTRACT

The idea behind doing this project is to know how many people shop online. The necessary statistical information for the proper execution of the project was collected by the means of questionnaire [SURVEY], a specimen of which is appended with the project.

Our Objectives to study the effects of different aspects such as age, gender, area, qualification, occupation etc. on online shopping.

We represent the data by graphically by using pie charts and bar diagrams. We used chi-square test for checking dependency of attributes and for testing equality proportion we use proportion test.

At the end we came up with the conclusion regarding various characteristics related to expenditure of people on online shopping.

Key words: Online shopping, Chi – square test, Proportion test

METHODOLOGY

There are five students in this project group. The first objective was to decide the sample size and method of sampling. To decide about method of sampling we needed to know the total number of people who shop online in their daily lives. But due to some restriction we could not get the exact figure. Therefore, we collected a sample of 400 people from age 15 and above, each member of this group collected the data of 80 people.

It was decided that no particular method of sampling be followed for the above stated reasons. As per the objectives of the project we framed a questionnaire of 15 questions which have been designed to cover all necessary information for the survey. The initial part of questionnaire consisted questions about the personal details, for example: - gender, age group, status of individual, education etc. The latter part of the questionnaire covered information regarding online shopping. Because of this format of questionnaire, we could test the interdependence of different attributes. The major part of the project involves collection of data from the people of different fields and simultaneously ensuring the randomness in the procedure of the data.

QUESTIONNAIRE

The questionnaire is about the “Statistical Analysis of Online shopping”. We collected data from the people who live in city and villages, who are students, businessmen, persons form service sector, house wives and of other occupations.

Questionnaire used for collecting the data is as given below.

QUESTIONNAIRE

Name:

Age:

Gender:

A) Male B) Female

Qualification:

A) Up to 10^{th} B) 11^{th}&12^{th}

C) Graduate D) Post Graduate

Occupation:

A) Students B) Service

C) Business D) Housewife

E) Other

Monthly Income:

A) Less than 15,000 B) 15000 -30000

C) 30000 – 45000 D) 45000- 60000

E) 60000 – 90000 E) 90000 & Above

Location/Area:

A) Urban B) Rural

Q.1) Do you like to shop online?

A) Yes B) No

Q.2) If yes, how often do you make online purchase?

A) Once in a month B) Once in 2-3 months

C) More than in 6 months D) 1-3 times in a year

E) As and when required

Q.3) What is the average amount do you spend per purchase while shopping online?

A) Up to 500 B) 500-1000

C) 1000-5000 D) As and when required

Q.4) Generally when do you prefer making online purchase?

A) During festive season B) During heavy discount period

C) Depend on mood and desire D) As and when required

Q.5) How do you make payments mostly when shopping online?

A) Debit card B) Credit card

C) Cash on delivery D) Paytm wallet or other e-wallet

Q.6) Which type of product do you purchase online?

A) Garments B) Electronic Good

C) Books/Educational material D) Cosmetics

E) Toys / CD's / Video games F) Other (specify)

Q.7) Which website do you prefer for online shop?

A) Amazon B) Snapdeal

C) Flipkart D) Myntra

E) Other

Q.8) What are the reasons prefer for e-shopping?

A) Save money B) Save time

C) Convenient D) Range and availability of products

Q.9) Have you faced any problem in online purchasing?

A) Yes B) No

If yes, what kind of problems?

A) Delay in delivery B) Cheap Quality

C) Damaged product D) Non-delivery

E) Fake

Q.10) How do you rate your experience of online purchase?

A) Very much satisfied B) Satisfied

C) Not Satisfied D) Can't say

Q.11) Do you feel secure while shopping online?

A) Yes B) No

Q.12) Does cash on delivery option influences you to do online shopping?

A) Yes B) No

Q.13) Which feature do you think are necessary for online shopping websites to have?

A) Privacy and Secure Checkout B) Customer Friendly

C) Credibility D) Customer Service Centre

E) Comparison between different sites

Q.14) Rank the features which you consider important in stopping you from shopping online?

A) Hacking B) Risk of not getting what you paid for

C) Difficulty in returning products

D) Waiting to receive the product (delivering issues)

E) Not being able touch or see products

Q.15) Does “free shipping” option motivates you to shop online?

A) Yes B) No

QUESTIONNAIRE CODING

Age:

A) 15-25	B) 25-35	C) 35-45	D) 45&Above
1	2	3	4

Gender:

A)Male	B)Female
1	2

Qualification:

A)Up to 10^{th}	B)11^{th}&12^{th}	C)Graduate	D)Post Graduate
1	2	3	4

Occupation:

A) Student	B)Service	C)Business	D)Housewife	E)Other
1	2	3	4	5

Monthly Income:

A)<15000	15000-30000	30000-45000	45000-60000	60000-90000	90000&Above
1	2	3	4	5	6

Location/Area:

A)Urban	B)Rural
1	2

Q.1) Do you like to shop online ?

A)Yes	B)No
1	2

Q.2)If yes, how often do you make online purchase?

A)Once in a month	B)Once in 2-3 months	C)More than in 6 months	D)1-3 times in a year	E)As& when required
1	2	3	4	5

Q.3)What is the average amount do you spend per purchase while shopping online?

A)Up to 500	B)500-1000	C)1000-5000	D)As & when required
1	2	3	4

Q.4)Generally when do you prefer making online purchase?

A)During festive season	B)During heavy discount period	C)Depend on mood and desire	D)As & when required
1	2	3	4

Q.5) How do you make payments mostly when shopping online?

A)Debit card	B)Credit card	C)Cash on delivery	D) Paytm or other e-wallet
1	2	3	4

Q.6)Whichtype of product do you purchase online?

A)Garments	B)Electronics Goods	C)Books & Educational material	D)Cosmetics	E)Toys /CD's /Video games	F)Other
1	2	3	4	5	6

Q.7)Which website do you prefer for online shop?

A)Amazon	B)Snapdeal	C)Flipkart	D)Myntra	E)Other
1	2	3	4	5

Q.8) What are the reasons prefer for e-shopping?

A)Save money	B)Save time	C)Convenient	D)Range & availability of products
1	2	3	4

Q.9) Have you faced any problem in online purchasing?

A)Yes	B)No
1	2

If yes, what kind of problems?

A)Delay in delivery	B)Cheap Quality	C)Damaged product	D)Non delivery	F)Fake
1	2	3	4	5

Q.10) How do you rate your experience of online purchase?

A) Very much satisfied	B) Satisfied	C) Not Satisfied	D) Can't say
1	2	3	4

Q.11) Do you feel secure while shopping online?

A) Yes	B) No
1	2

Q.12) Does cash on delivery option influences you to do online shopping?

A) Yes	B) No
1	2

Q.13) Which feature do you think are necessary for online shopping websites to have?

A) Privacy and Secure Checkout	B) Customer Friendly	C) Credibility	D) Customer Service Centre	E) Comparison between different sites
1	2	3	4	5

Q.14) Rank the features which you consider important in stopping you from shopping online?

A) Hacking	B) Risk of not getting what you paid for	C) Difficulty in returning products	D) Waiting to receive the product (delivering issues)	E) Not being able touch or see products
1	2	3	4	5

Q.15) Does "free shipping" option motivates you to shop online?

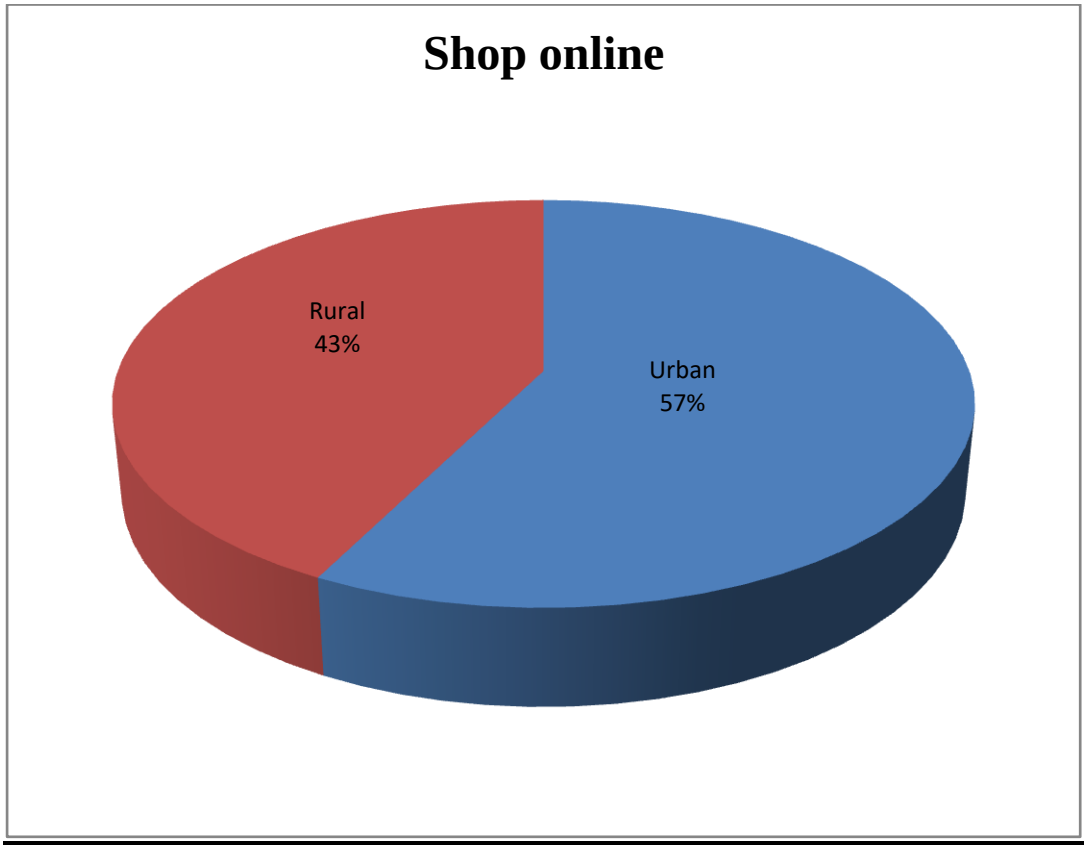
A) Yes	B) No
1	2

STATISTICAL ANALYSIS DATA

GRAPHICAL REPRESENTATION

A) PIE CHARTS :

1) Location wise shopping

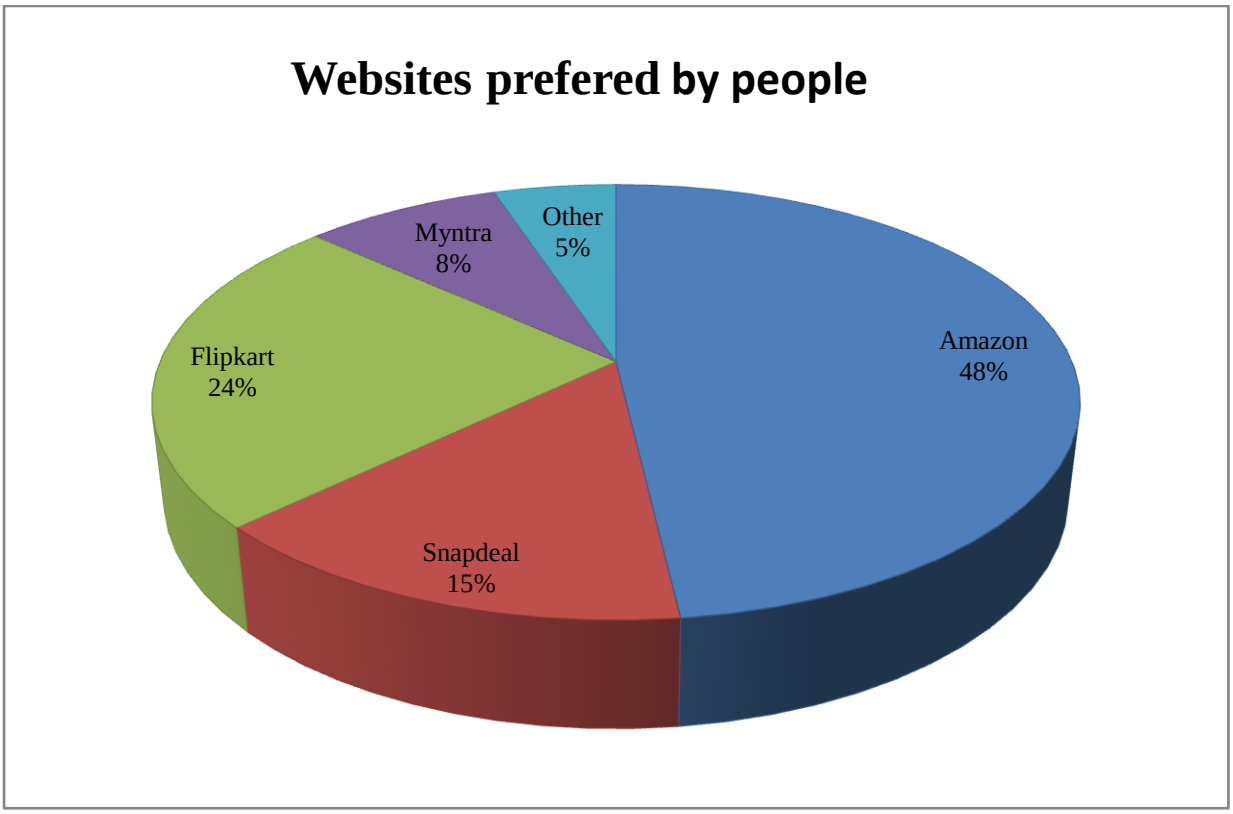


Conclusions:

- 57% People in urban area shop online.
- 43% People in rural area shop online.

2) Most preferable websites for online shopping

Website	Total
Amazon	170
Snapdeal	52
Flipkart	84
Myntra	29
Other	18

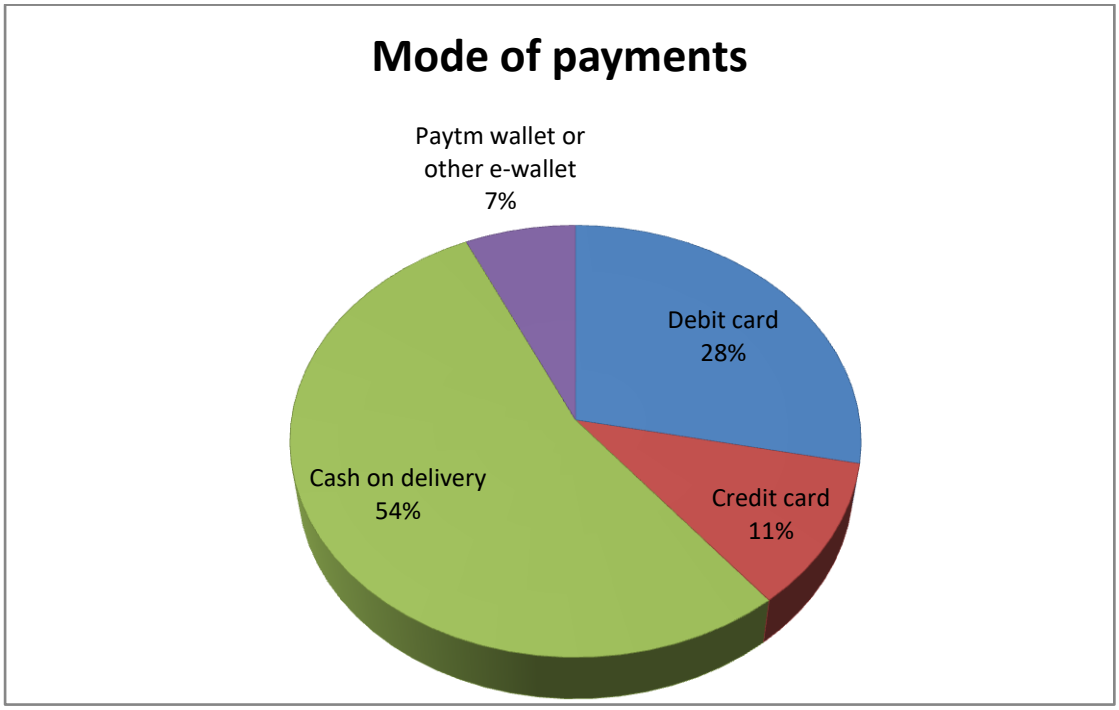


Conclusions:

- 48% People prefer Amazon website for online shopping.
- 15% People prefer Snapdeal website for online shopping.
- 24% People prefer Flipkart website for online shopping.
- 08% People prefer Myntra website for online shopping.
- 05% People prefer other websites for online shopping.

3) Mode of payments for online shopping.

Payments	Total
Debit card	90
Credit card	35
Cash on delivery	172
Paytm wallet or other e-wallet	22

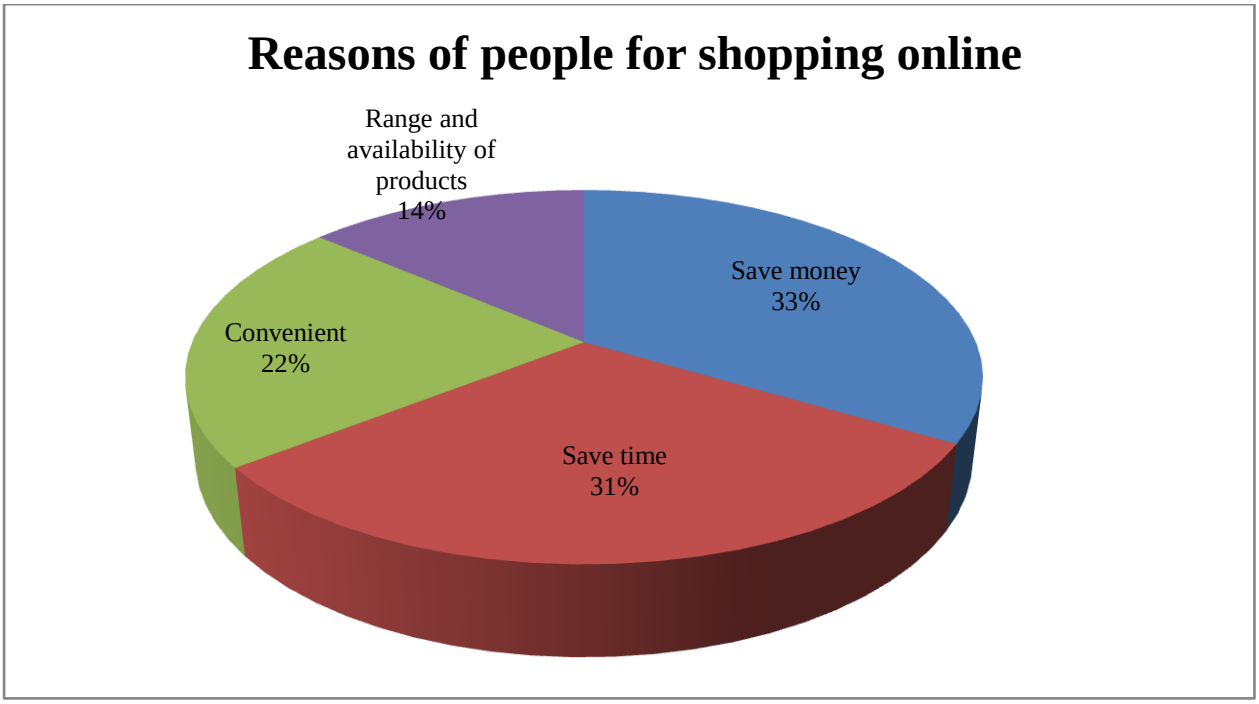


Conclusions:

- 28% People make payment with debit card.
- 11% People make payment with credit card.
- 54% People make payment with cash on delivery card.
- 07% People make payment with paytm wallet other e-wallet.

4)Reasons of people for shopping online

Reason of shopping	Total
Save money	115
Save time	106
Convenient	75
Range and availability of products	47



Conclusions:

- 33% People prefer online shopping for saving money.
- 31% People prefer online shopping for saving time.
- 22% People prefer online shopping because of convenience.
- 14% People prefer online shopping because of wide range of availability of products.

5) Experience of people on online shopping.

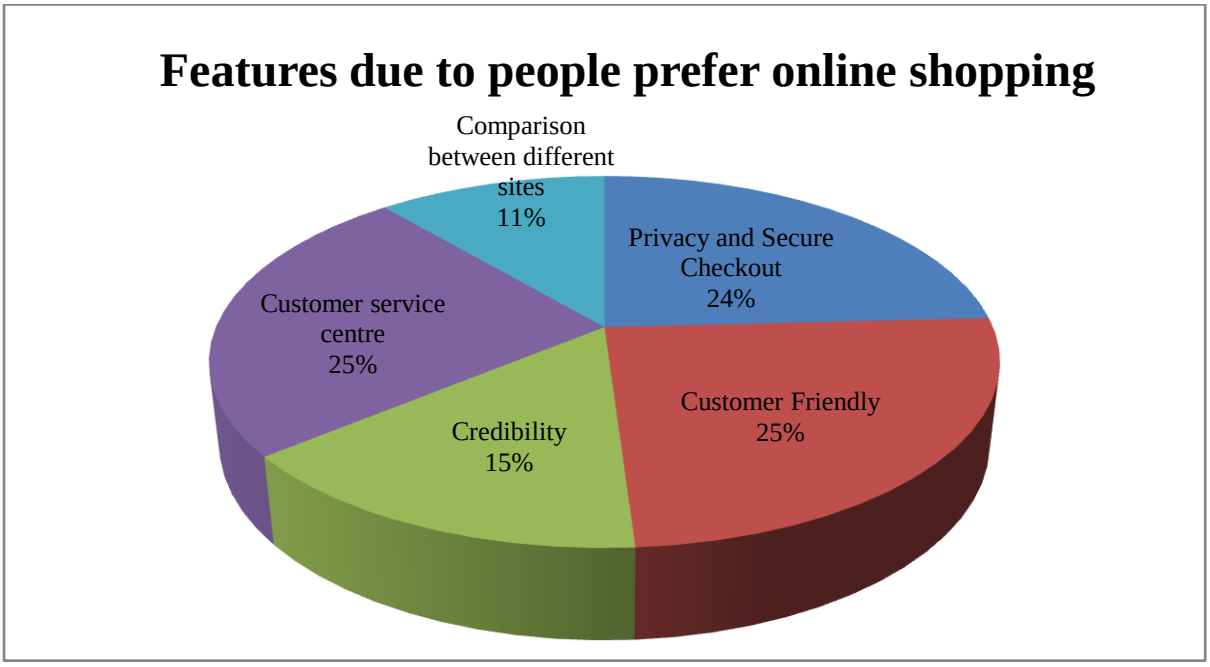
Experience	Total
Very much satisfied	69
Satisfied	154
Not satisfied	30
Can't say	34

Conclusion:

- 24% People are very much satisfied with online shopping.
- 54% People are satisfied with online shopping.
- 10% People are not satisfied with online shopping.
- 12% People are does not give their opinion about online shopping.

6) Feature that are necessary for online shopping websites to have.

Features	Total
Privacy and Secure Checkout	82
Customer Friendly	84
Credibility	51
Customer service centre	84
Comparison between different sites	38



Conclusion:

- 24% People think that privacy and secure check out is necessary for online shopping.
- 25% People think that customer friendly is necessary for online shopping.
- 15% People think that credibility is necessary for online shopping.
- 25% People think that customer service centre is necessary for online shopping.
- 11% People think that comparison between different sites is necessary for online shopping.

7) The risks that stop you from shop online.

Features	Total
Hacking	57
Risk of not getting what you paid for	90
Difficulty in returning products	52
Waiting to receive the product	54
Not being able to touch or see products	91

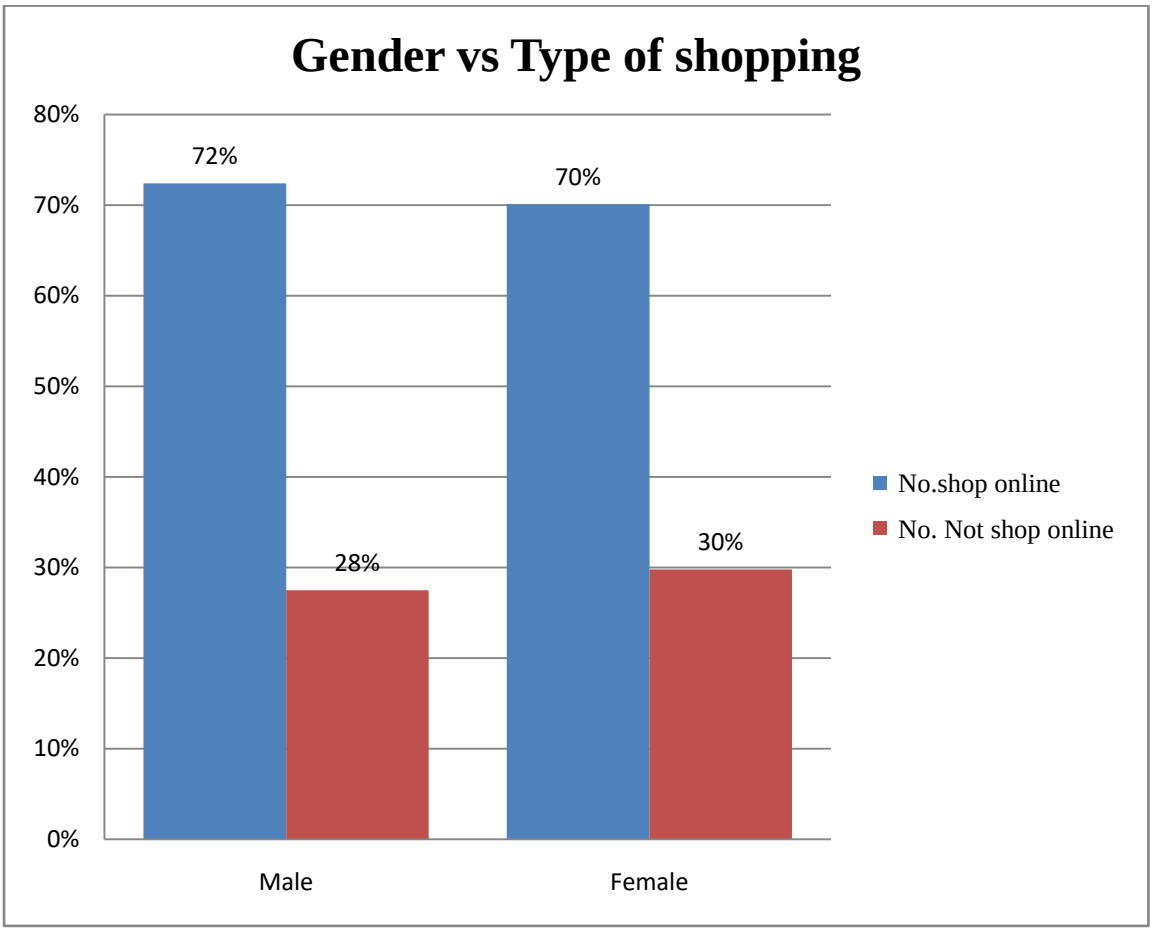
Conclusion:

- 17% People think that the risk hacking is stop from shop online.
- 26% People think that the risk of not getting what you paid for is stop from shop online.
- 15% People think that the difficulty in returning products is stop from shop online.
- 16% People think that the waiting to receive the product is stop from shop online.
- 26% People think that the not being able touches or see products is stop from shop online.

B) BAR DIAGRAM

1)Gender wise proportion who shop online and not shop online

Gender	shop online	Not shop online
Male	200	76
Female	87	37

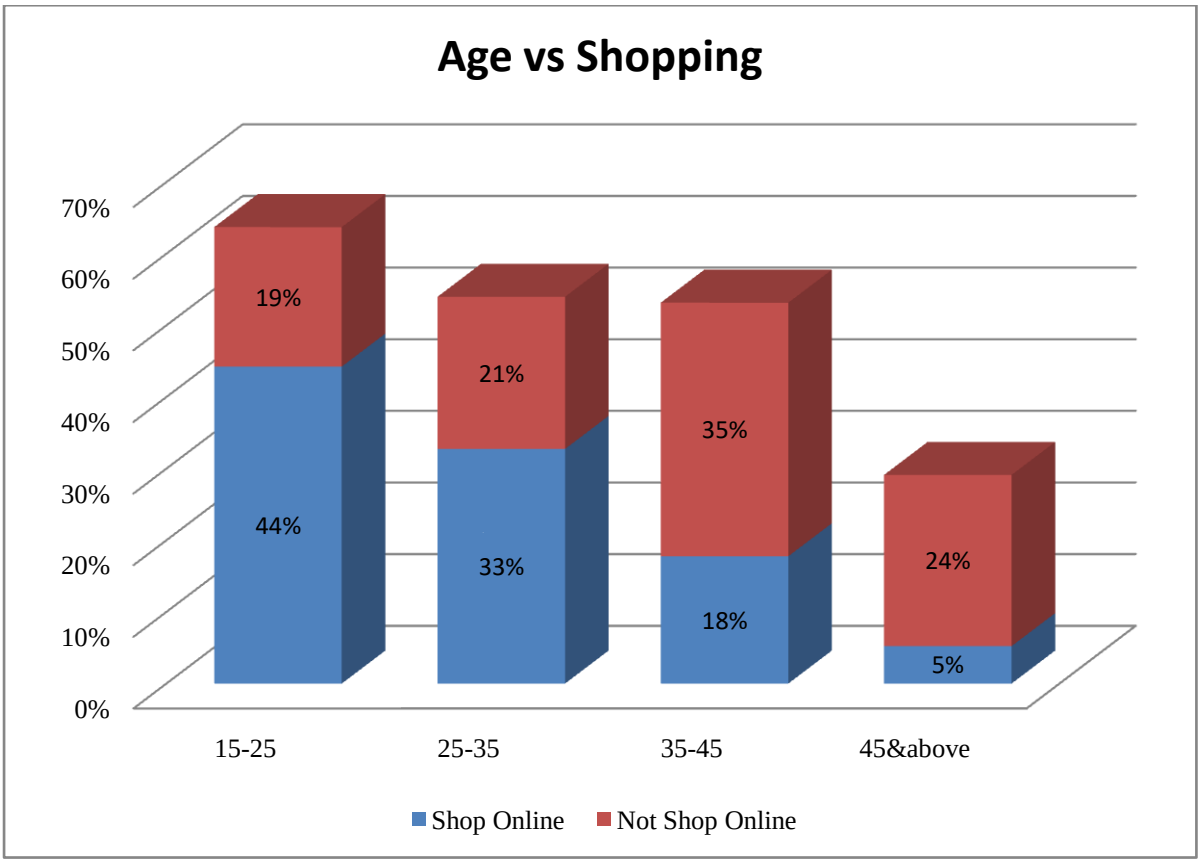


Conclusion:

- 72% Males prefer shop online.
- 28% Males do not prefer shop online.
- 70% Females prefer shop online.
- 30% Females do not prefer shop online.

2)Age vs. Shopping

Age	Shop Online	Not Shop Online
15-25	127	22
25-35	94	24
35-45	51	40
45&above	15	27

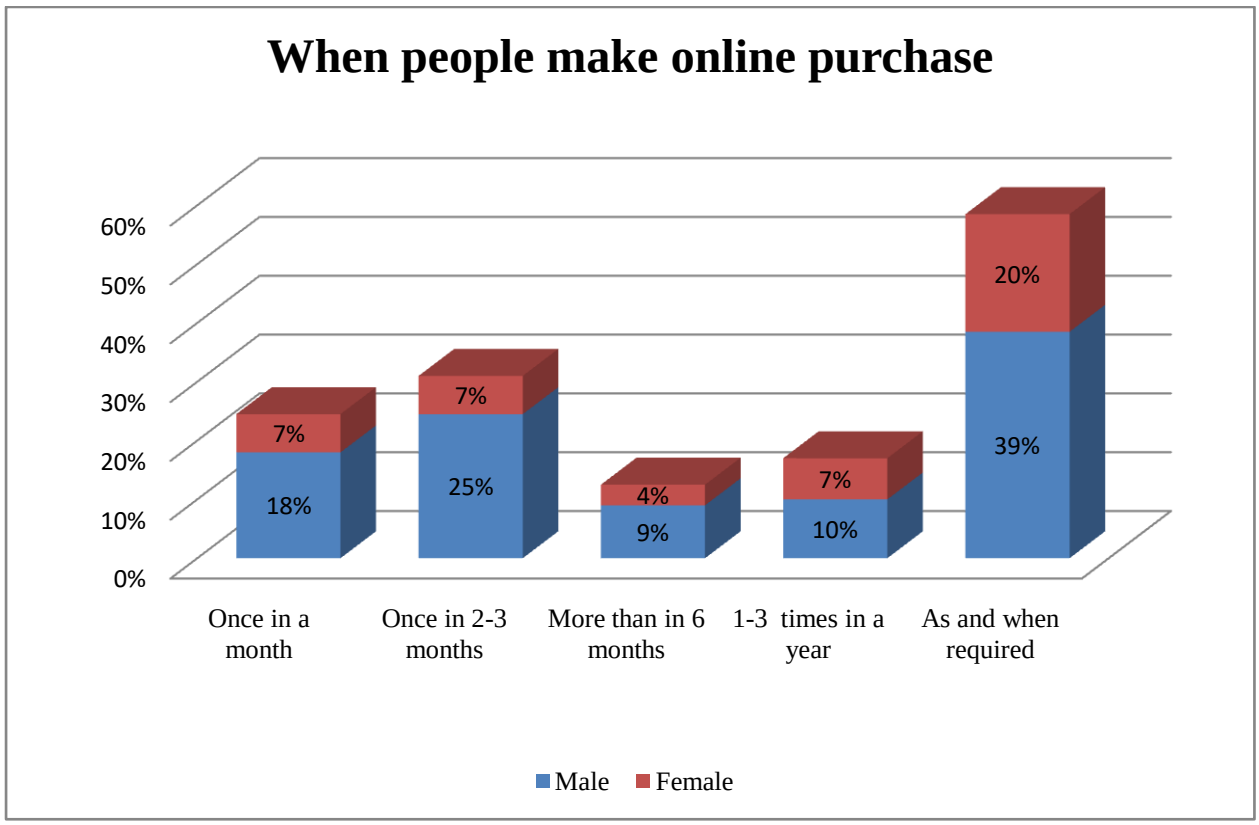


Conclusion:

- 44% People shop online and 19% peoples do not shop online of age group 15-25 years.
- 33% People shop online and 21% peoples do not shop online of age group 25-35 years.
- 18% People shop online and 35% peoples do not shop online of age group 35-45 years.
- 05% People shop online and 24% peoples do not shop online of age group 45 and above years.

3) How often do you make online purchase

Online Purchase	Male	Female	Total
Once in a month	36	13	49
Once in 2-3 months	49	13	62
More than in 6 months	18	7	25
1-3 times in a year	20	14	34
As and when required	77	40	117

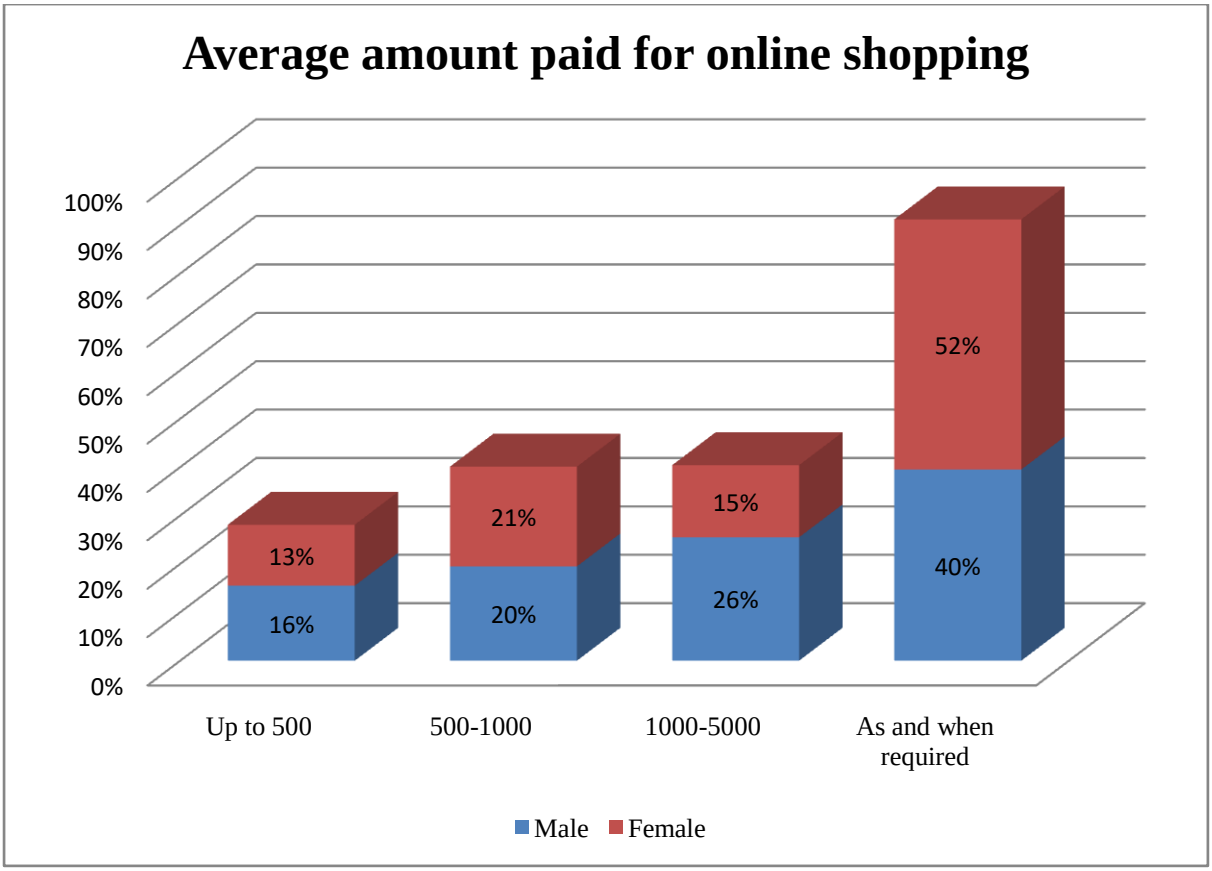


Conclusion:

- 18% Males and 07% females make online purchase once in month.
- 25% Males and 07% females make online purchase once in 2-3 months.
- 09% Males and 04% females make online purchase more than in 6 months.
- 39% Males and 20% females make online purchase as and when required.

4)Online shopping amount vs. gender

Shopping amount	Male	Female	Total
Up to 500	31	11	42
500-1000	39	18	57
1000-5000	51	13	64
As and when required	79	45	124

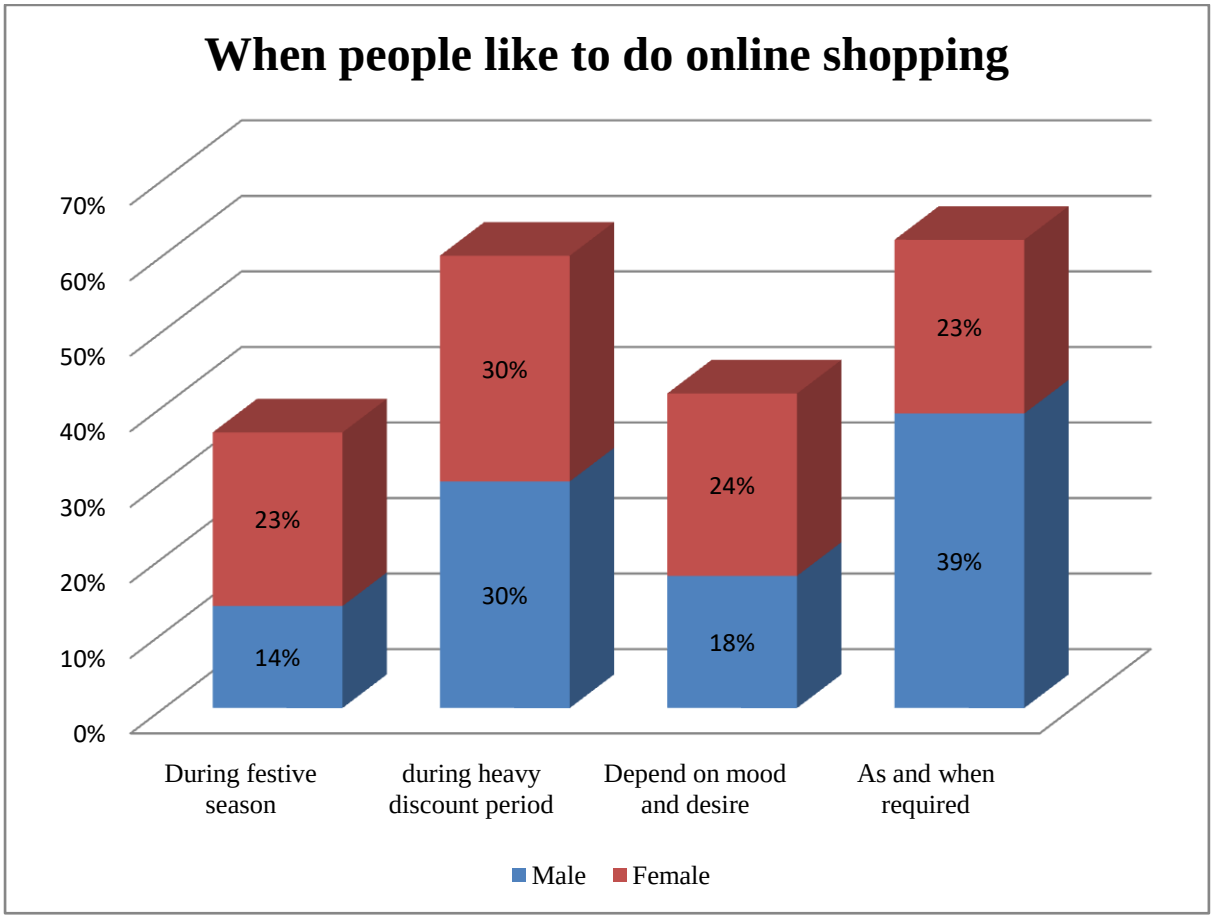


Conclusion:

- 16% Males and 13% females spend average amount up to Rs.500 on online shopping.
- 20% Males and 21% females spend average amount between Rs.500 to Rs.1000 on online shopping.
- 26% Males and 15% females spend average amount between Rs.1000 to Rs.5000 on online shopping.
- 40% Males and 52% females spend as and what amount required for online shopping

5)Generally when do you prefer making online purchase

Online Purchase	Male	Female	Total
During festive season	27	20	47
During heavy discount period	60	26	86
Depend on mood and desire	35	21	56
As and when required	78	20	98

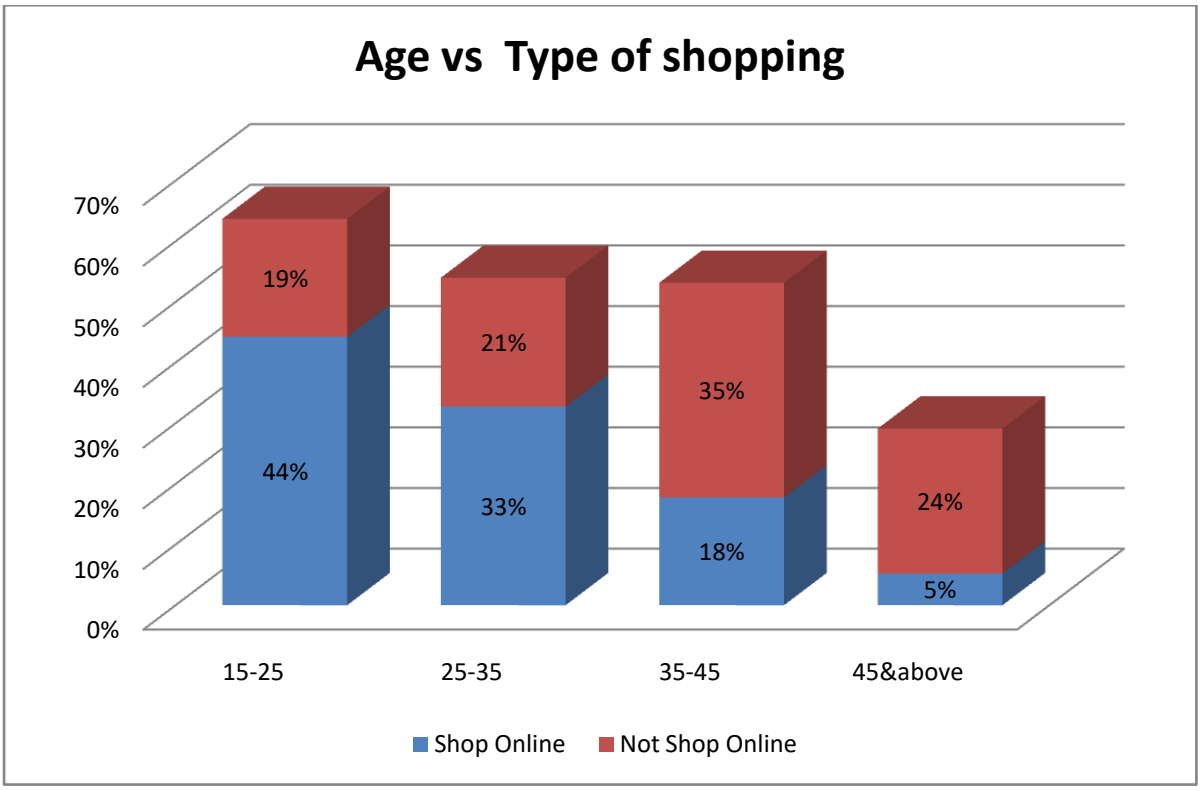


Conclusion:

- 14% Males and 23% females do online shopping during festive season.
- 30% Males and 30% females do online shopping during heavy discount period.
- 18% Males and 24% females do online shopping depend on mood and desire.
- 39% Males and 23% females do online shopping as and when required.

6)Age vs. Shopping

Age	Shop Online	Not Shop Online
15-25	127	22
25-35	94	24
35-45	51	40
45&above	15	27

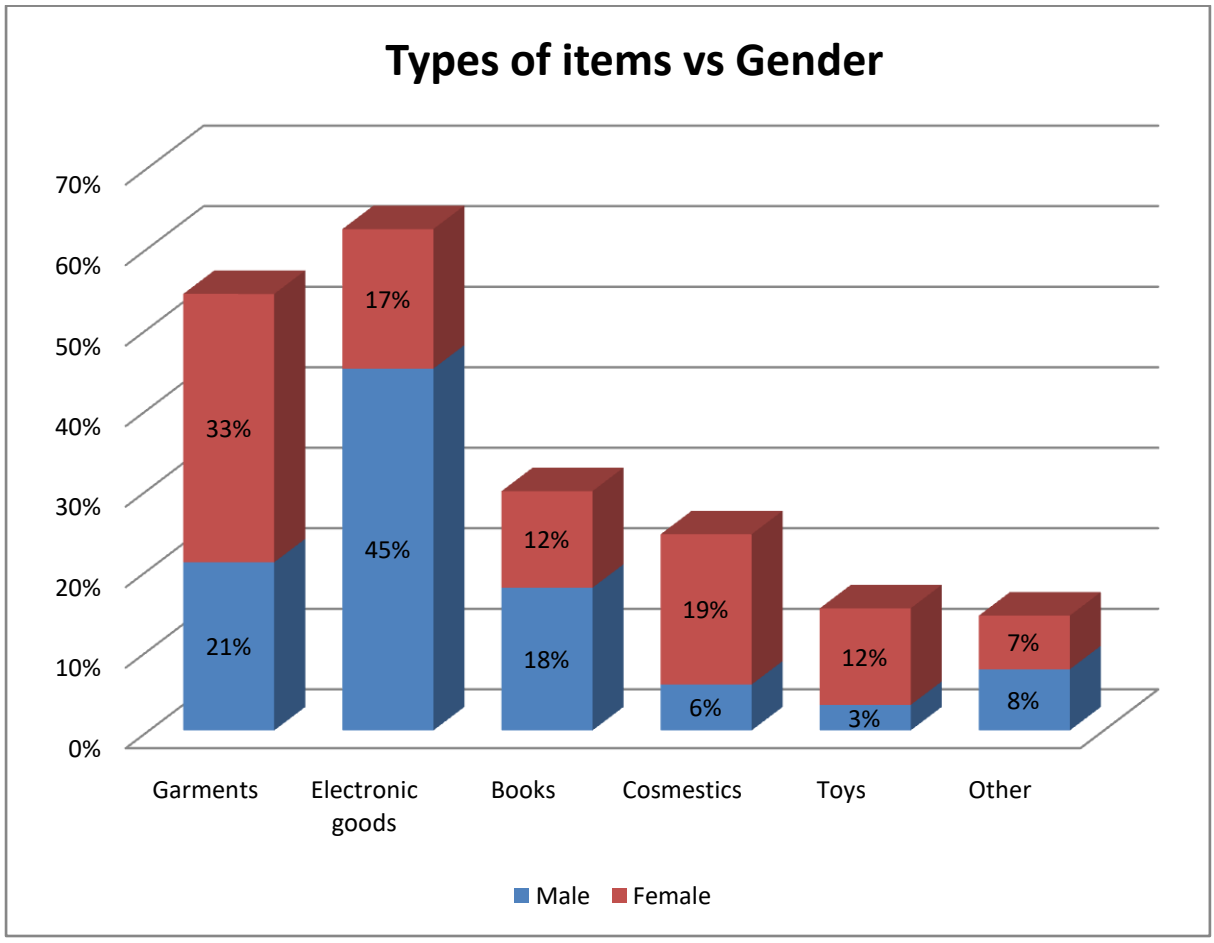


Conclusion:

- 44% People shop online and 19% peoples do not shop online of age group 15-25 years.
- 33% People shop online and 21% peoples do not shop online of age group 25-35 years.
- 18% People shop online and 35% peoples do not shop online of age group 35-45 years.
- 05% People shop online and 24% peoples do not shop online of age group 45 and above years.

7))Type of items vs. gender

Types of items	Gender	
	Male	Female
Garments	33	25
Electronic goods	71	13
Books	28	9
Cosmetics	9	14
Toys	5	9
Other	12	5

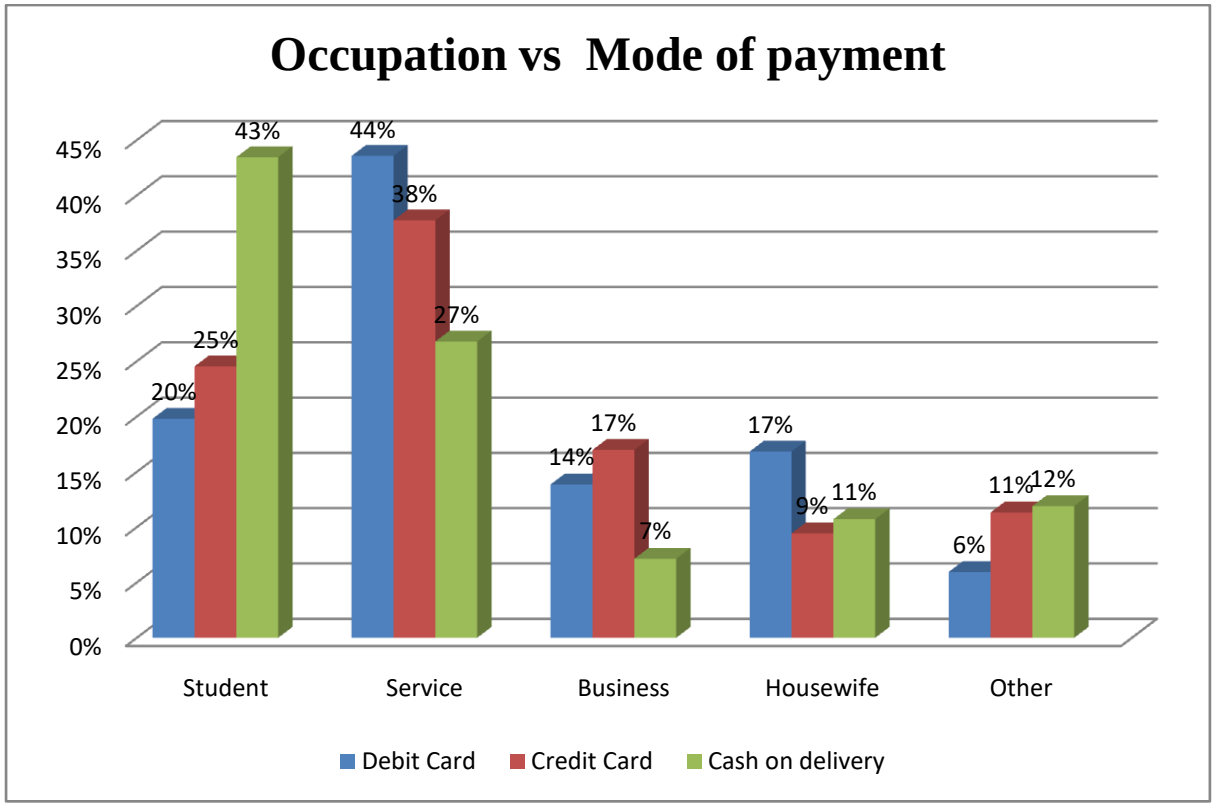


Conclusion:

- 21% Males and 33% females shop garments online.
- 45% Males and 17% females shop electronic goods online.
- 18% Males and 12% females shop books and educational material online.
- 06% Males and 19% females shop cosmetics online.
- 03% Males and 12% females shop toys online.
- 08% Males and 07% females shop other items online.

8)Occupation vs. Mode of payment

Occupation	Mode of payment		
	Debit Card	Credit Card	Cash on delivery
Student	20	13	73
Service	44	20	45
Business	14	9	12
Housewife	17	5	18
Other	6	6	20



Conclusions:

- 20% Students, 44% service, 14% business, 17% housewife, 6% other occupation peoples use debit card for payment.
- 25% Students, 38% service, 17% business, 9% housewife, 11% other occupation peoples use credit card for payment.
- 43% Students, 27% service, 7% business, 11% housewife, 12% other occupation peoples use cash on delivery for payment.

PROPORTION TEST

1. TESTING EQUALITY OF TWO POPULATION PROPORTION ($P_1=P_2$)

H_0: Proportion of males who shop online is same as that of females who shop online, i.e.

H_0: $P_1=P_2$

Vs

H_1: Proportion of males who shop online is not same as that of females who shop online, i.e.

H_1: $P_1 \neq P_2$

```
> x=c(200,87)
> n=c(276,124)
>prop.test(x,n)
```

2-sample test for equality of proportions with continuity correction

data: x out of n

X-squared = 0.1246, df = 1, p-value = 0.7241

alternative hypothesis: two.sided

95 percent confidence interval:

-0.07906284 0.12511240

sample estimates:

prop 1 prop 2

0.7246377 0.7016129

Conclusion:

- **Proportion of males and females who shop online is same.**

2. TESTING EQUALITY OF TWO POPULATION PROPORTION ($P_1=P_2$)

H_0: Proportion of males in urban who shop online is same as that of females in urban who shop online, i.e. $P_1=P_2$

Vs

H_1: Proportion of males in urban who shop online is not same as that of females in urban who shop online, i.e. $P_1\neq P_2$

> x=c(119,46)

> n=c(176,78)

>prop.test(x,n)

2-sample test for equality of proportions with continuity correction

data: x out of n

X-squared = 1.413, df = 1, p-value = 0.2346

Alternative hypothesis: two.sided

95 percent confidence interval:

-0.05206826 0.22485381

Sample estimates:

prop 1 prop 2

0.6761364 0.5897436

Conclusion:

- **Proportion of males in urban is same as that of females in urban who shop online, i.e. $P_1=P_2$**

3. TESTING EQUALITY OF TWO POPULATION PROPORTION ($P_1=P_2$)

H_0: Proportion of males in rural who shop online is same as that of females in rural who shop online, i.e. $P_1=P_2$

Vs

H_1: Proportion of males in rural who shop online is not same as that of females in rural who shop online, i.e. $P_1 \neq P_2$

```
> x=c(81,41)

> n=c(100,46)

>prop.test(x,n)

 2-sample test for equality of proportions with continuity correction

data:  x out of n

X-squared = 0.9821, df = 1, p-value = 0.3217

alternative hypothesis: two.sided

95 percent confidence interval:

 -0.21550619  0.05289749

Sample estimates:

   prop 1    prop 2

0.8100000 0.8913043
```

<u>Conclusion:</u>

- **Proportion of males in rural is same as that of females in rural who shop online, i.e. $P_1=P_2$**

4. TESTING EQUALITY OF TWO POPULATION PROPORTION ($P_1=P_2$)

H_0: Proportion of males in urban who shop online is same as that of males in rural who shop online, i.e. $P_1=P_2$

Vs

H_1: Proportion of males in urban who shop online is not same as that of males in rural who shop online, i.e. $P_1\neq P_2$

```
> x=c(119,81)

> n=c(176,100)

>prop.test(x,n)
```

2-sample test for equality of proportions with continuity correction

Data: x out of n

X-squared = 5.0755, df = 1, p-value = 0.02427

Alternative hypothesis: two.sided

95 percent confidence interval:

-0.24510415 -0.02262312

sample estimates:

prop 1 prop 2

0.6761364 0.8100000

Conclusion:

- **Proportion of males in urban is not same as that of males in rural who shop online, i.e. $P_1\neq P_2$**

5. TESTING EQUALITY OF TWO POPULATION PROPORTION ($P_1=P_2$)

H_0: Proportion of females in urban who shop online is same as that of females in rural who shop online, i.e. $P_1=P_2$

Vs

H_1: Proportion of females in urban who shop online is not same as that of females in rural who shop online, i.e. $P_1 \neq P_2$

> x=c(46,41)

> n=c(78,46)

>prop.test(x,n)

2-sample test for equality of proportions with continuity correction

Data: x out of n

X-squared = 11.17, df = 1, p-value = 0.0008314

Alternative hypothesis: two.sided

95 percent confidence interval:

-0.4602840 -0.1428375

sample estimates:

prop 1 prop 2

0.5897436 0.8913043

Conclusion:

- **Proportion of females in urban is not same as that of females in rural who shop online, i.e. $P_1 \neq P_2$**

CHI-SQUARE TEST FOR TESTING THE INDEPENDENCE OF TWO ATTRIBUTES:

We test independence of some pairs of attributes the rejection or acceptance of the respective null hypothesis would reflect on the severity of the attributes.

Procedure:

Computing system for independency /dependency:

In this section, we make a tabular form of n levels of attributes A & m levels of attributes B such as,

A B	$B_1, B_2,$ --------- $B_j,$ ---------,B_m	Total
A_1	$O_{11}, O_{12},$ --------, $O_{1j},$---------,O_{1m}	(A_1)
A_2	$O_{21}, O_{22},$---------,$O_{2j},$---------,O_{2m}	(A_2)
!	!	(!)
!	!	(!)
A_i	$O_{i1}, O_{i2},$----------, $O_{ij},$----------,O_{im}	(A_i)
!	!	(!)
A_n	$O_{n1}, O_{n2},$---------,$O_{nj},$---------,O_{nm}	(A_n)
Total	$(B_1), (B),$--------, $(B_j),$---------,(B_m)	N

Where,

Oij = Observed frequency corresponding to i^{th} row and j^{th} column.

.i.e. corresponding to $(i, j)^{th}$ Cell.

i = 1,2,,……..,m.

j = 1,2,……,n.

(Ai) = $\sum_{j=1}^{m}$ Oij = Total of observed frequency in the i^{th} row.

(Bj) = $\sum_{i=1}^{n}$ Oij = Total of observed frequency in the j^{th} column.

Where, Ai = i^{th} level of 1^{st} attribute

Bj = j^{th} level of 2^{nd} attribute

Here to test,

H_0: Two attributes A & B are independent.

Vs

H_1: Two attributes A & B are dependent.

Fix Level of significance (l.o.s.) = α

For carrying out above test we compute test statistic as follows,

$$X^2 = \sum_{i=1}^{n} \sum_{j=1}^{m} \frac{(Oij - Eij)^2}{Eij}$$

$$= \sum_{i=1}^{n} \sum_{j=1}^{m} \left(\frac{Oij^2}{Eij}\right) - N$$

Where,

Eij= Expected frequency corresponding to (i,j) cell.

$$= \frac{(Ai)(Bj)}{N}$$, i=1,2,……n.

j= 1,2-------m

N=Total frequency

Also Under Ho

$\chi^2 \sim \chi^2$ (n-1)*(m-1),d.f.

Decision Rule:

We reject Ho if

χ^2 (cal.) $> \chi^2$ (n-1)*(m-1),α

Otherwise accept Ho otherwise.

Conclusion:

CHI-SQUARE TEST

1.TEST FOR INDEPENDENCE OF TYPE OF SHOPPING AND LOCATION OF

TWO ATTRIBUTES ARE DEFIND AS:

A: Location

B: Types of shopping

Level of Significance (l.o.s.) = 0.05

TO Test:

H_0: Location and Types of shopping are independent

Vs

H_1: Location and Types of shopping are dependent

OBSERVATION TABLE:

Type of shopping	Location	
	Urban	Rural
Shop online	165	122
Not shop online	89	24

```
> x=matrix(c(165,122,89,24), byrow = T,ncol = 2)

> y=chisq.test (x)

> y

 Pearson's Chi-squared test with Yates' continuity correction

data:  x

X-squared = 14.921, df = 1, p-value = 0.0001121

> a=0.05

> pv=y$p.value
> pv

[1] 0.000112097
```

```
> if(pv<=a){cat("we reject Ho")}else{cat("we accept Ho")}
we reject Ho
```

Result: We reject Ho at 5% l.o.s.

Conclusion:

- **Location and types of shopping are dependent.**

2)TEST FOR INDEPENDENCE OF AGE GROUP AND AVERAGE AMOUNT SPEND PER PURCHASE

TWO ATTRIBUTES ARE DEFINED AS:

A: Age of person

B:Average amount spend per purchase

Level of significance(l.o.s)=0.05

To Test:

H_0: Age group and average amount spend per purchase on online shopping are independent

Vs

H_1: Age group and average amount spend per purchase on online shopping are dependent

OBSERVATION TABLE:

Age Group	Up To 1000	1000-5000	As and When Required
15-25	71	22	34
25-35	20	26	48
35& Above	6	16	42

```
> m=matrix(c(71,20,6,22,26,16,34,48,42),byrow = T,ncol = 3)

> c=chisq.test(correct = T)
> c

Pearson's Chi-squared test
data:  m
X-squared = 53.192, df = 4, p-value = 7.769e-11

> a=0.05

> pv=c$p.value
> pv

[1] 7.76872e-11

> if(pv<=a){cat("we reject Ho")}else{cat("we accept Ho")}
we reject Ho
```

Result: We reject Ho at 5% l.o.s.

Conclusion:

- **Age group and average amount spend per purchase on online shopping are dependent.**

3)TEST FOR INDEPENDENCE OF AGE GROUP AND FRQUENCY OF SHOPPING:

TWO ATTRIBUTES ARE DEFINED AS:

A: Age of person

B: Frequency of shopping

Level of significance(l.o.s.) = 0.05

TO TEST:

H_0: Age of person and frequency of shopping are independent

Vs

H_1: Age of person and frequency of shopping are dependent

OBSERVATION TABLE:

Age Group	Once in a month	Once in 2-3 months	More than in 6 months	1-3 times in a year	As and when required
15-25	36	31	10	10	44
25-35	10	25	11	12	36
35& Above	6	6	5	12	37

```
> m=matrix(c(36,31,10,10,44,10,25,11,12,36,6,6,5,12,37),byrow = T,ncol = 5)

> m
     [,1] [,2] [,3] [,4] [,5]
[1,]   36   31   10   10   44
[2,]   10   25   11   12   36
[3,]    6    6    5   12   37

> c=chisq.test(m)

> c

 Pearson's Chi-squared test

data:  m
X-squared = 29.715, df = 8, p-value = 0.0002373

> a=0.05

> pv=c$p.value
> pv

[1] 0.0002373143
```

```
> if(pv<=a){cat("we reject Ho")}else{cat("we accept Ho")}
we reject Ho
```

Result: We reject Ho at 5% l.o.s.

Conclusion:

- **Age of person and frequency of shopping are dependent.**

4)TEST FOR INDEPENDENCE OF GENDER AND TYPES OF ITEMS PURCHASED

TWO ATTRIBUTES ARE DEFINED AS:

A: Gender

B: Type of items purchased

Level of significance (l.o.s.) =0.05

TO TEST:

H_0: Type of products purchased by males and by females who shop online are independent

Vs

H_1: Type of products purchased by males and by females who shop online are dependent

OBSERVATION TABLE:

Types of products	Gender	
	Male	**Female**
Garments	33	25
Electronic goods	71	13
Books	28	9
Cosmetics	9	14
Toys	5	9
Other	12	5

```
> y=scan("clipboard")
Read 12 items
> x=matrix(y,byrow = T,ncol = 2)
> x
     [,1] [,2]
[1,]   33   25
[2,]   71   13
[3,]   28    9
[4,]    9   14
```

[5,] 5 9

[6,] 12 5

> chisq.test(x)

Pearson's Chi-squared test

data: x

X-squared = 30.298, df = 5, p-value = 1.288e-05

> a=0.05

> pv=c$p.value

> pv

[1] 1.288363e-05

> if(pv<=a){cat("we reject Ho")}else{cat("we accept Ho")}

we reject Ho

Result: We reject Ho at 5% l.o.s.

<u>Conclusion:</u>

- **Type of products purchased by males and that of by females is dependent.**

5.TEST FOR INDEPENDENE OF GENDER AND MODE OF PAYMENT

TWO ATTRIBUTES ARE DEFINED AS:

A: Gender

B: Mode of payment

Level of significance (l.o.s.) = 0.05

TO TEST:

H_0: The gender and mode of payment of online shopping are independent

VS

H_1: The gender and mode of payment of online shopping are dependent

OBSERVATION TABLE:

Mode of payment	Gender	
	Male	**Female**
Debit card	74	9
Credit card	25	10
Cash on delivery	111	60
Paytm wallet or other e-wallet	11	11

```
m=matrix(c(74,9,25,10,111,60,11,11),byrow = T,ncol = 2)
> c=chisq.test(m)
> c
Pearson's Chi-squared test
data:  m
X-squared = 21.108, df = 3, p-value = 9.999e-05
> a=0.05
> pv=c$p.value
```

> pv

[1] 9.998864e-05

> if(pv<=a){cat("we reject Ho")}else{cat("we accept Ho")}

we reject Ho

Result: We reject Ho at 5% l.o.s.

Conclusion:

- **The gender and mode of payment of online shopping are dependent.**

6. TEST FOR INDEPENDENCE OF QUALIFICATION AND STATUS OF SHOPPING

TWO ATTRIBUTES ARE DEFIEND AS:

A: Education

B: Status of shopping

Level of significance (l.o.s.) = 0.05

TO TEST:

H_0: Qualification and Status of shopping are independent

Vs

H_1: Qualification and Status of shopping are dependent

OBSERVATION TABLE:

Qualification	Status of shopping	
	Online	Not shop online
Up to 10th	26	56
11th & 12th	55	35
Graduate	155	16
Post Graduate	51	6

```
> m=matrix(c(26,56,55,35,155,16,51,6),byrow = T,ncol=2)

> m

     [,1] [,2]
[1,]   26   56
[2,]   55   35
[3,]  155   16
[4,]   51    6


> c=chisq.test(m)

> c
```

Pearson's Chi-squared test

data: m

X-squared = 108.84, df = 3, p-value = 2.2e-16

> a=0.05

> pv=c$p.value

> pv

[1] 1.94978e-23

> if(pv<=a){cat("we reject Ho")}else{cat("we accept Ho")}

we reject Ho

Result: We reject Ho at 5% l.o.s.

Conclusion:

- **Qualification and Status of shopping are dependent.**

7. <u>TEST FOR INDEPENDENCE OF MONTHLY INCOME AND NO. OF TIMES PEOPLES ONLINE SHOPPING:</u>

TWO ATTRIBUTES ARE DEFIEND AS:

A: Monthly Income

B: No. of times people shop online

Level of significance (l.o.s.) = 0.05

TO TEST:

H_0: Monthly income and no. of times people shop online are independent

Vs

H_1: Monthly income and no. of times people shop online are dependent

OBSERVATION TABLE:

Monthly Income	Once in 2-3 months	1-3 times in a year	As and when required
less than 15000	9	11	17
15000-30000	25	11	19
30000-45000	20	10	26
45000-60000	5	5	11
60000-90000	5	5	5

```
> x=scan("clipboard")

Read 15 items

> m=matrix(x,byrow = T,ncol = 3)

> m

     [,1] [,2] [,3]
[1,]    9   11   17
[2,]   25   11   19
[3,]   20   10   26
[4,]    5    5   11
[5,]    5    5    5
> chisq.test(m)

Pearson's Chi-squared test

data:  m
```

X-squared = 7.9285, df = 8, p-value = 0.4405

Result: We Accept Ho at 5% l.o.s.

Conclusion:

- **Monthly income and no. of times people shop online are independent.**

8. TEST FOR INDEPENDENCE OFEXPERIENCE OF PEOPLE OF ONLINE SHOPPING AND GENDER:

TWO ATTRIBUTES ARE DEFIEND AS:

A: People's experience of online shopping

B: Gender

Level of significance (l.o.s.) = 0.05

TO TEST:

H_0: Experience of males and females of online shopping are independent

Vs

H_1: Experience of males and females of online shopping are dependent

OBSERVATION TABLE:

Experience	Gender	
	Male	**Female**
Very much satisfied	45	24
Satisfied	106	48
Not satisfied	21	9
Can't say	28	6

```
> y=scan("clipboard")
Read 8 items
> x=matrix(y,byrow = T,ncol = 2)
> x
     [,1] [,2]
[1,]   45   24
[2,]  106   48
[3,]   21    9
[4,]   28    6
> chisq.test(x)
```

Pearson's Chi-squared test

data: x

X-squared = 3.2894, df = 3, p-value = 0.3491

Result: We Accept Ho at 5% l.o.s.

Conclusion:

- **Experience of males and females of online shopping are independent.**

9. TEST FOR INDEPENDENCE OF OCCUPATION AND MODE OF PAYMENT:

TWO ATTRIBUTES ARE DEFIEND AS:

A: Occupation

B: Mode of payment

Level of significance (l.o.s.) = 0.05

TO TEST:

H_0: Occupation and mode of payment are independent

Vs

H_1: Occupation and mode of payment are dependent

OBSERVATION TABLE:

Occupation	Mode of payment		
	Debit Card	Credit Card	Cash on delivery
Student	20	13	73
Service	44	20	45
Business	14	9	12
Housewives	17	5	18
Other	6	6	20

```
> y=scan("clipboard")

Read 15 items

> x=matrix(y,byrow = T,ncol = 3)

> x

     [,1] [,2] [,3]
[1,]   20   13   73
[2,]   44   20   45
[3,]   14    9   12
[4,]   17    5   18
[5,]    6    6   20

> chisq.test(x)

 Pearson's Chi-squared test
```

data: x

X-squared = 27.139, df = 8, p-value = 0.0006689

Result: We Reject Ho at 5% l.o.s.

Conclusion:

- **Occupation and mode of payment are dependent.**

10. TEST FOR INDEPENDENCE OF QUALIFICATION AND GENDER WHO SHOP ONLINE:

TWO ATTRIBUTES ARE DEFIEND AS:

A: Qualification

B: Gender

Level of significance (l.o.s.) = 0.05

TO TEST:

H_0: Qualification of males and females who shop online are independent

Vs

H_1: Qualification of males and females who shop online are dependent

OBSERVATION TABLE:

Qualification	**Gender**	
	M	**F**
Up to 10th	16	10
11th & 12th	43	12
Graduate	110	45
Post Graduate	31	20

```
> y=scan("clipboard")
Read 8 items
> x=matrix(y,byrow = T,ncol = 2)
> x
     [,1] [,2]
[1,]   16   10
[2,]   43   12
```

[3,] 110 45

[4,] 31 20

> chisq.test(x)

Pearson's Chi-squared test

data: x

X-squared = 4.7299, df = 3, p-value = 0.1927

Result: We Accept Ho at 5% l.o.s.

Conclusion:

- **Qualification of males and females who shop online are independent.**

11. <u>TEST FOR INDEPENDENCE OF REASONS FOR PREFERENCE OF ONLINE SHOPPING AND GENDER:</u>

TWO ATTRIBUTES ARE DEFIEND AS:

A: Reasons for preference of online shopping

B: Gender

Level of significance (l.o.s.) = 0.05

TO TEST:

H_0: Reasons for preference of online shopping of males and females are independent

Vs

H_1: Reasons for preference of online shopping of males and females are dependent

OBSERVATION TABLE:

Reasons	**Gender**	
	Male	**Female**
Save money	79	35
Save time	80	26
Convenient	46	29
Range and availability of products	34	13

```
> y=scan("clipboard")
Read 8 items
> x=matrix(y,byrow = T,ncol = 2)
> x
     [,1] [,2]
[1,]   79   35
[2,]   80   26
[3,]   46   29
[4,]   34   13
```

> chisq.test(x)

Pearson's Chi-squared testdata: x

X-squared = 4.3312, df = 3, p-value = 0.2278

Result: We Accept Ho at 5% l.o.s.

Conclusion:

- **Reasons for preference of online shopping of males and females are independent.**

12) TEST FOR INDEPENDENCE OF AGE AND SHOPPING STATUS OF TWO ATTRIBUTES ARE DEFINED AS:

TWO ATTRIBUTES ARE DEFIND AS:

A: Age

B: Status of shopping

Level of Significance (l.o.s.) = 0.05

TO TEST:

H_0: Age of persons who shop online and not shop online are independent.

Vs

H_1: Age of persons who shop online and not shop online are dependent.

OBSERVATION TABLE:

Age	Status of shopping	
	Shop Online	Not shop online
15-25	127	12
25-35	94	24
35-45	51	40
45&above	15	27

```
> x=scan("clipboard")
Read 8 items
> y=matrix(x,byrow=T,ncol = 2)
> y
     [,1] [,2]
[1,]  127   12
[2,]   94   24
[3,]   51   40
[4,]   15   27
> chisq.test(y)

 Pearson's Chi-squared test
```

data: y

X-squared = 70.255, df = 3, p-value = 3.763e-15

Result: We reject Ho at 5% l.o.s.

Conclusion:

- **Age of persons who shop online and not shop online are dependent.**

13) TEST FOR INDEPENDENCE OF AGE AND MALES IN URBAN AND IN RURALWHO SHOP ONLINE OF TWO ATTRIBUTES ARE DEFINED AS:

TWO ATTRIBUTES ARE DEFIND AS:

A: Age

B: Males who shop online

Level of Significance (l.o.s.) = 0.05

TO TEST:

H_0: Age of males in urban and in rural who shop online are independent.

Vs

H_1: Age of males in urban and in rural who shop online are dependent.

OBSERVATION TABLE:

	Shop Online	
	Location	
Age group	Urban	Rural
15-25	58	37
25-35	41	15
35-45	14	21
45&above	6	6

```
> x=matrix(y,byrow = T,ncol = 2)
> x
     [,1] [,2]
[1,]   58   37
[2,]   41   15
[3,]   14   21
[4,]    6    6
> chisq.test(x)
```

Pearson's Chi-squared test

data: x

X-squared = 10.46, df = 3, p-value = 0.01504

Result: We reject Ho at 5% l.o.s.

Conclusion:

- **Age of males in urban and in rural who shop online are dependent.**

14) TEST FOR INDEPENDENCE OF AGE AND FEMALES IN URBAN AND IN RURALWHO SHOP ONLINE OF TWO ATTRIBUTES ARE DEFINED AS:

TWO ATTRIBUTES ARE DEFIND AS:

A: Age

B: Females who shop online

Level of Significance (l.o.s.) = 0.05

TO TEST:

H_0: Age of females in urban and in rural who shop online are independent.

Vs

H_1: Age of females in urban and in rural who shop online are dependent.

OBSERVATION TABLE:

Age group	Shop Online	
	Location	
	Urban	Rural
15-25	23	9
25-35	17	21
35&above	6	11

```
> y=scan("clipboard")
Read 6 items
> x=matrix(y,byrow = T,ncol = 2)
> x
     [,1] [,2]
[1,]   23    9
[2,]   17   21
[3,]    6   11
> chisq.test(x)
```

Pearson's Chi-squared test

data: x

X-squared = 7.7549, df = 2, p-value = 0.0207

Result: We reject Ho at 5% l.o.s.

Conclusion:

- **Age of females in urban and in rural who shop online are dependent.**

Conclusions

1. Online shopping is more preferred in urban area as compared to rural area.
2. Number of males in urban is same as that of females in urban who shop online.
3. Number of males in rural is same as that of females in rural who shop online.
4. Number of males in urban who shop online is more than that of males in rural who shop online.
5. Number of females in urban who shop online is more than that of females in rural who shop online.
6. Small age people spend fewer amounts per purchase as compared to elder peoples.
7. People of age group 15-35 years shop more.
8. Online shopping depends on qualification.
9. Mode of payment preferred depends on occupation.
10. Mostly people like to do online shopping during heavy discount period as well as and when they required.
11. Mostly people prefer Amazon website.
12. Saving of time and money are main reasons of doing online shopping.
13. Usually people choose cash on delivery option for payment.
14. There is large number of peoples are satisfied with online shopping.
15. We observed that, people are doing online shopping because they want not only privacy and security but also customer service centre.
16. Most of the reasons of that stop people from doing online shopping are risk of not getting what you paid for and not being able to touch or to see products.

LIMITATIONS

1. Speaking about the limitations of the project, the first and foremost is that this is a preliminary survey of 400 persons due to limitations in time, we could reach out to only a small part of the population which could not be a good representative of the entire population.
2. The fact that people may not have revealed correct personal information, might have affected the authenticity of the data.

SCOPE

This project can open several new horizons and dimensions to have a deeper look into the usage of online shopping.

The issue can be further studied in detail to determine the convenience of online shopping. As in further we can gain knowledge about statistical inference and analysis.

By implementing better sampling techniques, a larger sample which is a better representative of the population can be taken to conduct the study at a greater depth.