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Analysing 120 Years Olympics Dataset Exploratory Data Analysis

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Abstract: ***Olympic games are an event where athletes from all over the world participate to compete with each other. In this paper, we have tried to study the data of Olympic games from the year 1896 – 2016.***
To study the dataset and derive conclusions we have used different python libraries which are used for Data Analysis. Libraries such as 'numpy', 'pandas', 'matplotlib', 'seaborn' are used to study the dataset.
The purpose of this paper is to analyse the country wise participation, participation of female athletes, participation of female athletes in Summer and Winter Olympics, age distribution of participants and performance analysis in Olympics from 1896 to 2016.
Keywords: Olympic Games, Participants, Analysis, Female

I. INTRODUCTION

The Olympic Games are known as the world's best athletic competitions. More than 200 nations are participating in this event, which takes place once every 4 years. And in these four years, they exchanged Summer and Winter Olympics every two years. The body, known as the International Olympic Committee, oversees all aspects of the Olympic Games. An eye-catching event worldwide and gives all athletes the opportunity to bring fame to their nation. Athletes from different countries compete in these games. It is considered a sign of brotherhood. The Olympic logo is the five interlocking rings that represent the unity between the five continents - America, Africa, Australia, Europe and Asia. The colours are blue, yellow, black, green, and red. The rings are placed on a white background that forms the flag.
Different countries regularly host games at the Olympics.

Table 1: Cities hosted Olympic game

City	Years	Occurrence
Athena	[2004 1906 1896]	3
London	[2012 1948 1908]	3
Sankt Moritz	[1928 1948]	2
Paris	[1900 1924]	2
Stockholm	[1912 1956]	2
Los Angeles	[1932 1984]	2
Lake Placid	[1980 1932]	2
Innsbruck	[1964 1976]	2
Albertville	[1992]	1
Rio de Janeiro	[2016]	1
Roma	[1960]	1
Salt Lake City	[2002]	1
Sarajevo	[1984]	1
Sapporo	[1972]	1
Nagano	[1998]	1
Seoul	[1988]	1
Sochi	[2014]	1

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Squaw Valley	[1960]	1
St. Louis	[1904]	1
Sydney	[2000]	1
Tokyo	[1964]	1
Torino	[2006]	1
Oslo	[1952]	1
Montreal	[1976]	1
Munich	[1972]	1
Moskva	[1980]	1
Antwerpen	[1920]	1
Atlanta	[1996]	1
Barcelona	[1992]	1
Beijing	[2008]	1
Berlin	[1936]	1
Calgary	[1988]	1
Chamonix	[1924]	1
Cortina dAmpezzo	[1956]	1
Garmisch-Partenkirchen	[1936]	1
Grenoble	[1968]	1
Helsinki	[1952]	1
Lillehammer	[1994]	1
Melbourne	[1956]	1
Mexico City	[1968]	1
Amsterdam	[1928]	1
Vancouver	[2010]	1

Table 1 depicts the list of cities that have host Olympic games from 1896 – 2016. Athena has hosted total 3 Olympic events including the first one in 1896

II. ANALYSIS AND VISUALIZATION

The Olympic data set with data collection from 1896 to 2016 has been analysed. This dataset contains 271116 rows and 14 columns.

A. Indentifying Country Wise Participation in Olympics (1896 – 2016)

There are many reasons for the success of the Olympic Games. One of the key factors is the participation of athletes. Figure 1 shows the top 10 participating countries in the Olympic games from 1896 – 2016 where United States(17,847) tops the list followed by France(11,988), Great Britain(11,404), Italy(10,260), Germany(9326), Canada(9279), Japan(8289), Swedan(8052), Australia(7513), and Hungary(6547).

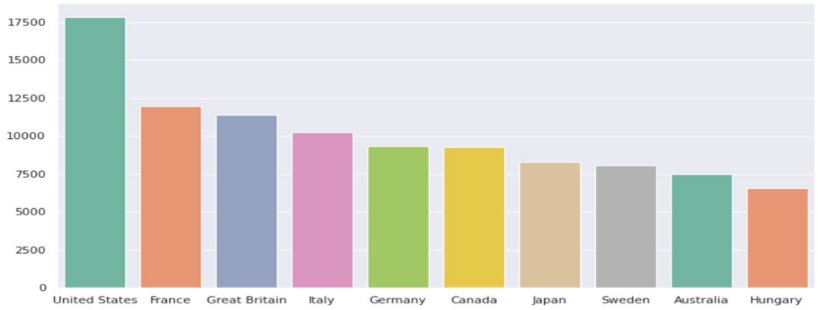


Fig 1: Top 10 Country wise participation of atheletes

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B. Identifying Gender Wise Distribution of Participants

The total number of participants in Olympics from 1896 – 2016 is 271,116 from which the number of male participants is 196594 i.e., 72.5% and the number of female participants is 74522 i.e., 27.5%.

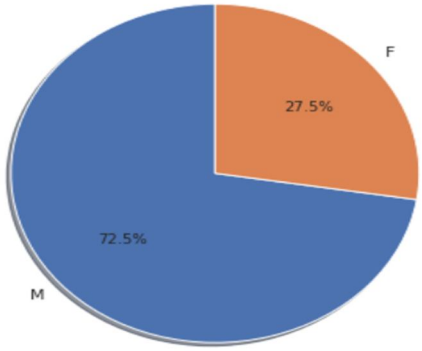


Fig 2: Gender Distribution of Male and Female atheletes

Increase in number of Females participation over the years



Fig 3: Increase in Female participation over the time

Figure 3 shows, the number of female athletes was gradually increasing from 1900 – 1980 and later, the number of female athletes has increased tremendously till 2016

C. Identifying Female Participation in Summer And Winter Olympic 1896 – 2016

Summer and Winter Games include different games for different seasons. There are individual and group events for men and women. Some events are held indoors, others outside. Summer Games have many different events than winter games.

1) *Sports in Summer Olympics:* Basketball, Judo, Football, Tug-Of-War, Athletics, Swimming, Badminton, Sailing, Gymnastics, Art Competitions, Handball, Weightlifting, Wrestling, Water Polo, Hockey, Rowing, Fencing, Equestrianism, Shooting, Boxing, Taekwondo, Cycling, Diving, Canoeing, Tennis, Modern Pentathlon, Golf, Softball, Archery, Volleyball, Synchronized Swimming, Table Tennis, Baseball, Rhythmic Gymnastics, Rugby Sevens, Trampolining, Beach Volleyball, Triathlon, Rugby, Lacrosse, Polo, Cricket, Ice Hockey, Racquets, Motorboating, Croquet, Figure Skating, Jeu De Paume, Roque, Basque Pelota, Alpinism, Aeronautic

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2) *Sports in Winter Olympics:* Speed Skating, Cross Country Skiing, Ice Hockey, Biathlon, Alpine Skiing, Luge, Bobsleigh, Figure Skating, Nordic Combined, Freestyle Skiing, Ski Jumping, Curling, Snowboarding, Short Track Speed Skating, Skeleton, Military Ski Patrol, Alpinism

Figure 4 shows the increase in number of Female participants over the years in Summer Olympics and figure 5 shows the increase in number of Female participants over the years in Winter Olympics from 1896 – 2016.

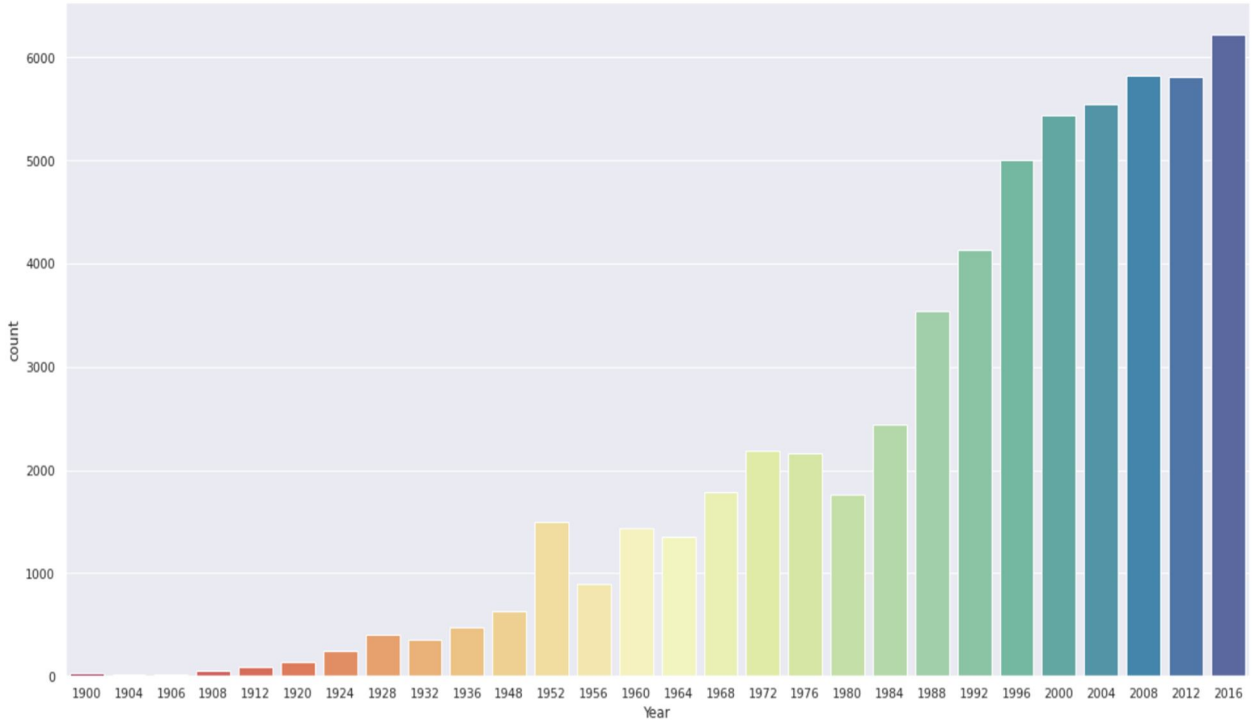


Fig 4: Count of female participants in Summer Olympics

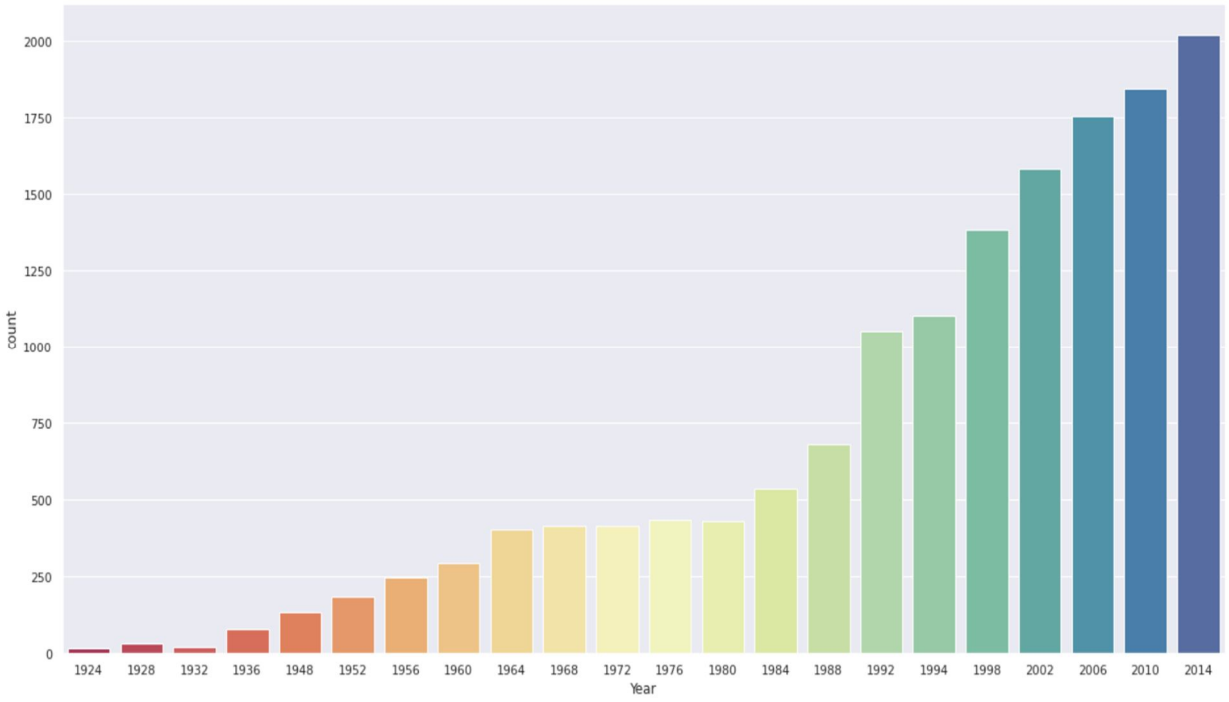


Fig 5: Count of female participants in Winter Olympics

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D. Identifying Age Distribution of Participants in Olympics from 1896 - 2016

Figure 6 shows the overall age distribution of atheletes in Olympic games. According to figure, the maximum number of athletes participating is in the 20-30 age group followed by the 30 – 40 age group. The number of atheletes above age 40 is very less.

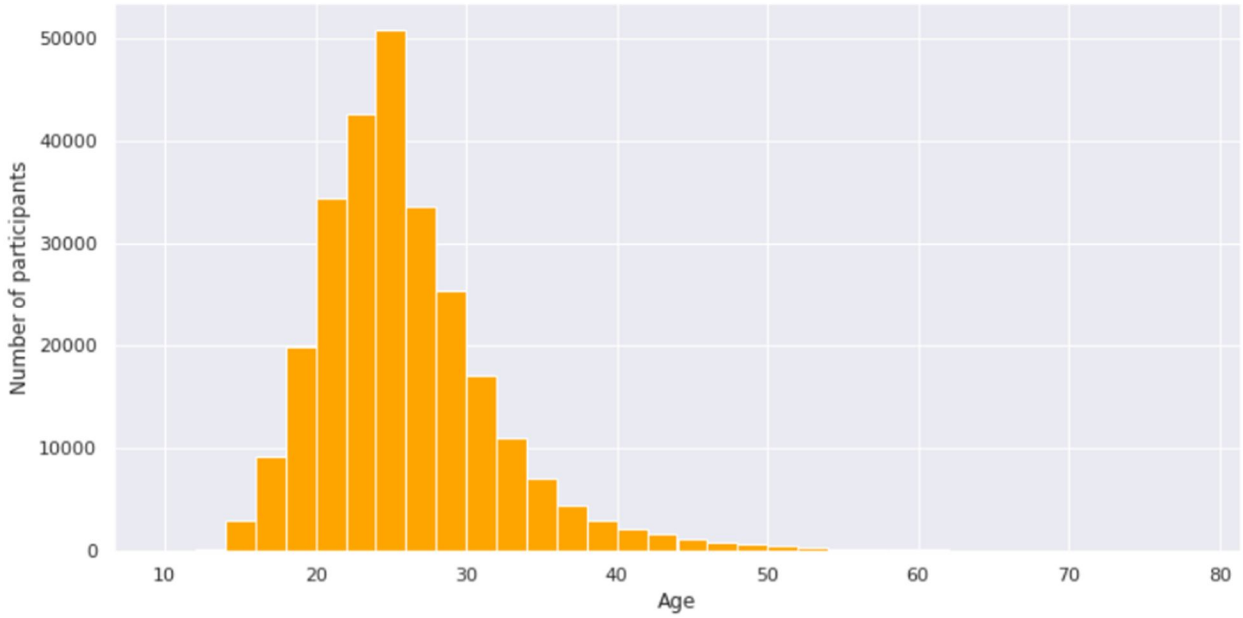


Fig 6: Age Distribution of Atheletes

E. Identifying Country Wise Performance in Olympics from 1896 – 2016

In an Olympic games, when any athelete wins the particular sport event he/she gets awarded with a medal. Performance of a particular country is determined by the number of medals it has won. Figure 7 shows that top 10 countries to win most number of medals. USA tops the medal tally with 2638 medals followed by Russia with 1599 medals, Germany with 1301 medals, UK with 678 medals, Italy with 575 medals, France with 501 medals, Sweden with 479 medals, Canada with 463 medals, Hungary with 432 medals and Norway with 378 medals in the span of 120 years of Olympics from 1896 – 2016.

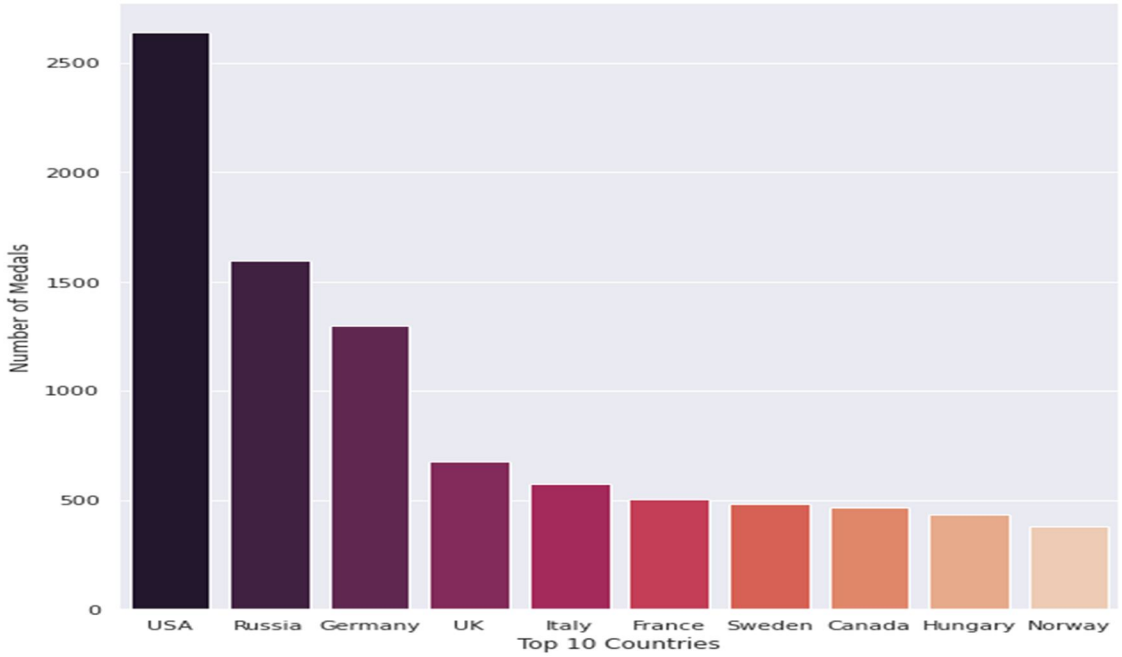


Fig 7: Top 10 Countries to win Gold Medals

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1) Gold Medal in sporting events for Athletes above 60 years



Fig 8: Medals in sporting events for atheletes above 60 years

Figure 8 shows the sporting events in which atheletes who are above 60 years have won medal. 1 medal in Art Competitions, 1 medal in Roque, 3 medals in Archery and 1 medal in shooting.

2) Height V/S Weight comparision of Olympic Medalists



Fig 8: Height V/S Weight of Olympic Medalists

III. CONCLUSION

After the detailed analysis of 120 years of Olympic dataset from 1896 – 2016, we conclude following :

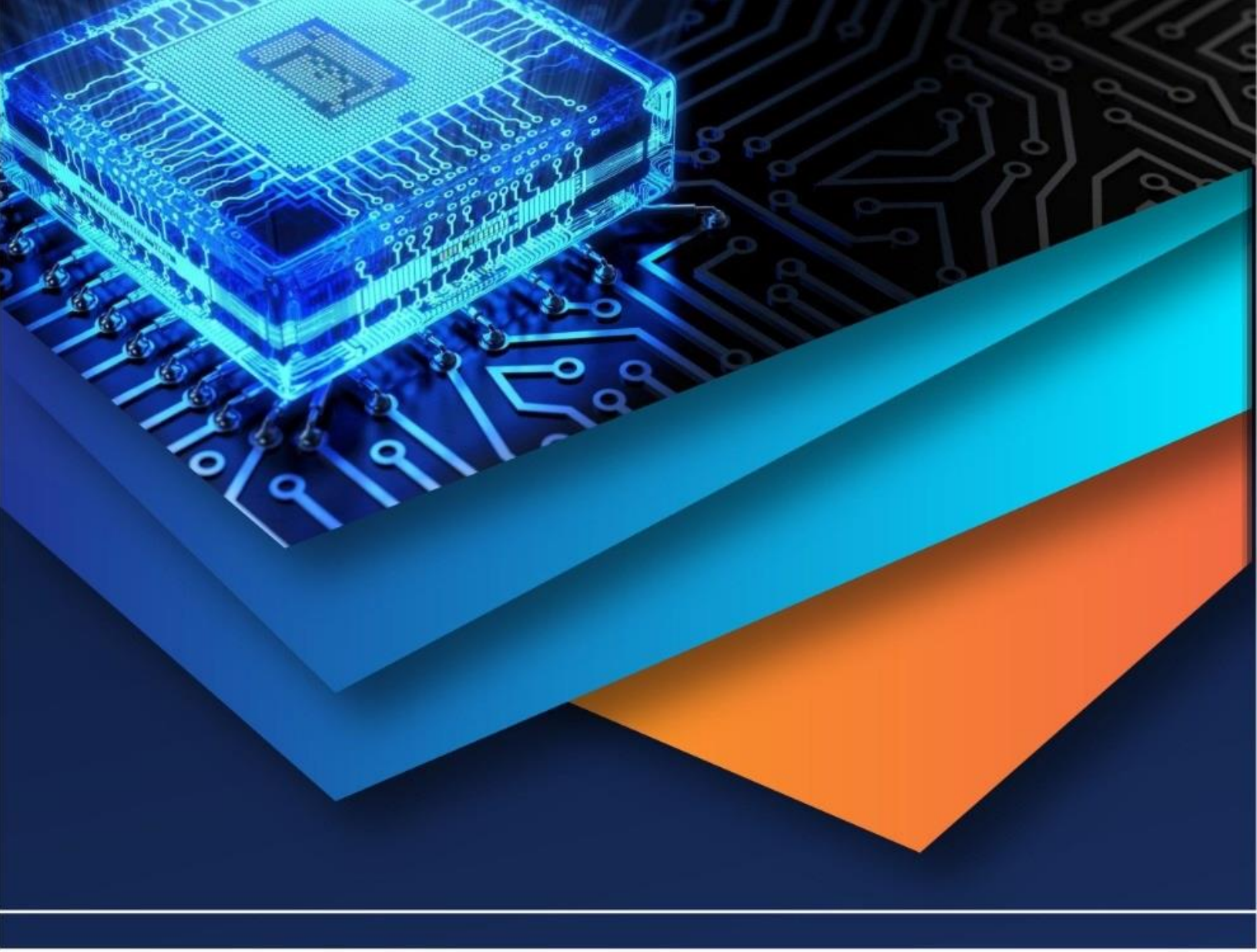
1) The more the number of participation of atheletes from a particular country, the higher the probability of winninag a medal of that country. United States has the highest number of participation (17,847) and has won most number of golds (2638).
2) Over the period of time, the number of participation of female atheletes is increased tremendously.
3) The participation of female atheletes in Summer Olympics is higher as compared to Winter Olympics games.
4) The maximun participation is of age group 20 – 30 years.
5) The atheletes who are above 60 years of age have won over all 6 gold medals.
6) Maximum number of males winning medals are from height ranges between 175 – 200 cms and from weight ranges between 80 – 120 kgs.
7) Maximum number of female winning medals are from height ranges between 150 – 170 cms and from weight ranges between 50 – 75 kgs.

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