

Digital humanities assignment #2

1. Description of the tool used

The tool I used for this assignment is Python. Python is a powerful programming language that is widely used for data analysis and visualization. It has a large ecosystem of libraries and tools that can be used to perform a wide range of data-related tasks, including reading and writing data from various file formats, cleaning and preprocessing data, transforming and manipulating data, and visualizing data using plots and charts. One of the most popular libraries for data visualization is Matplotlib, which I included in the assignment. Also I used folium to draw the Belgium map, and networkx to figure out the social network among the authors. These libraries provide a variety of functions and features for creating interactive and visually appealing plots and charts, which can be used to create more complex visualizations.

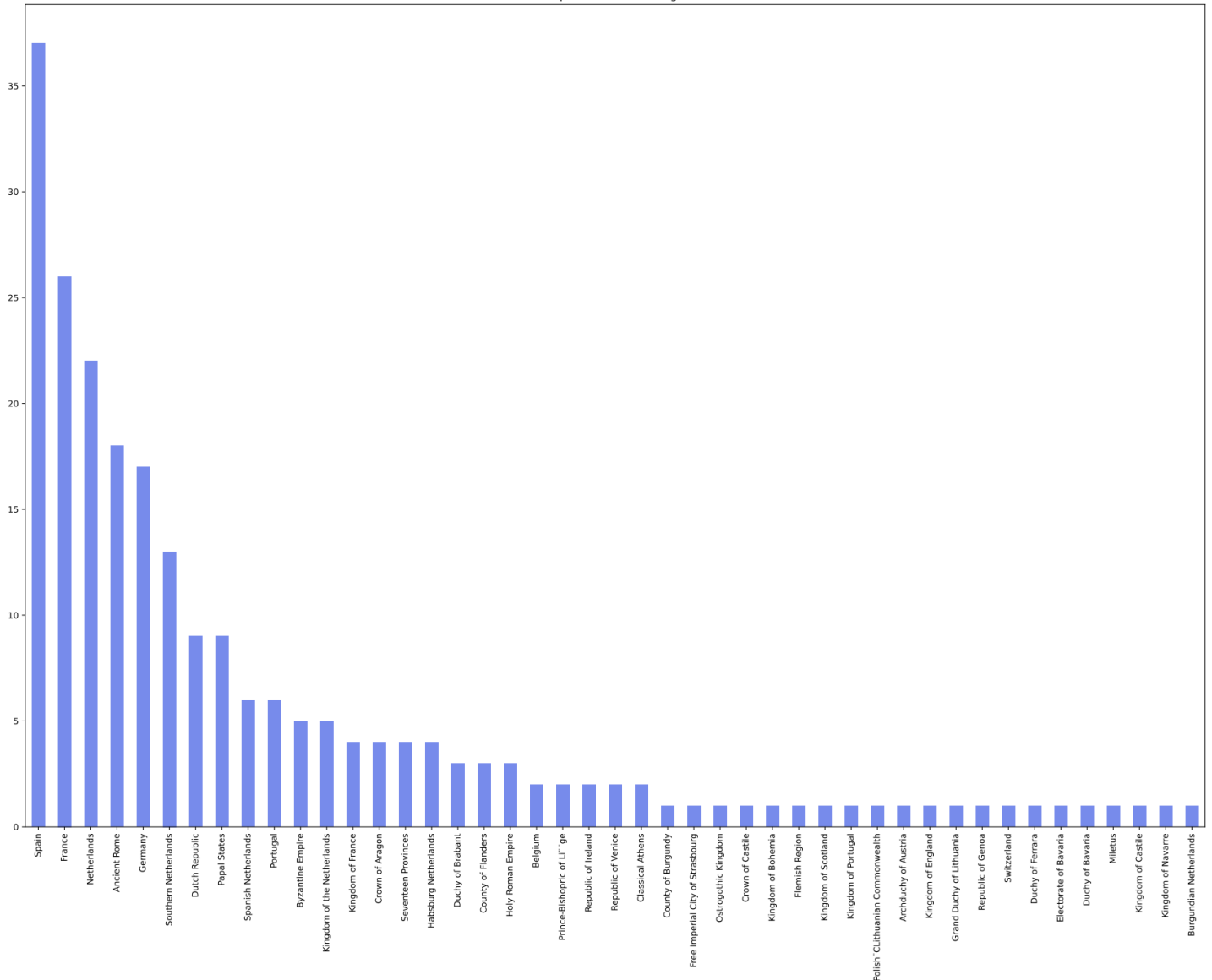
2. Results (and discussion) of the data analysis

i) Descriptive analysis

a) Information about authors

Citizenship

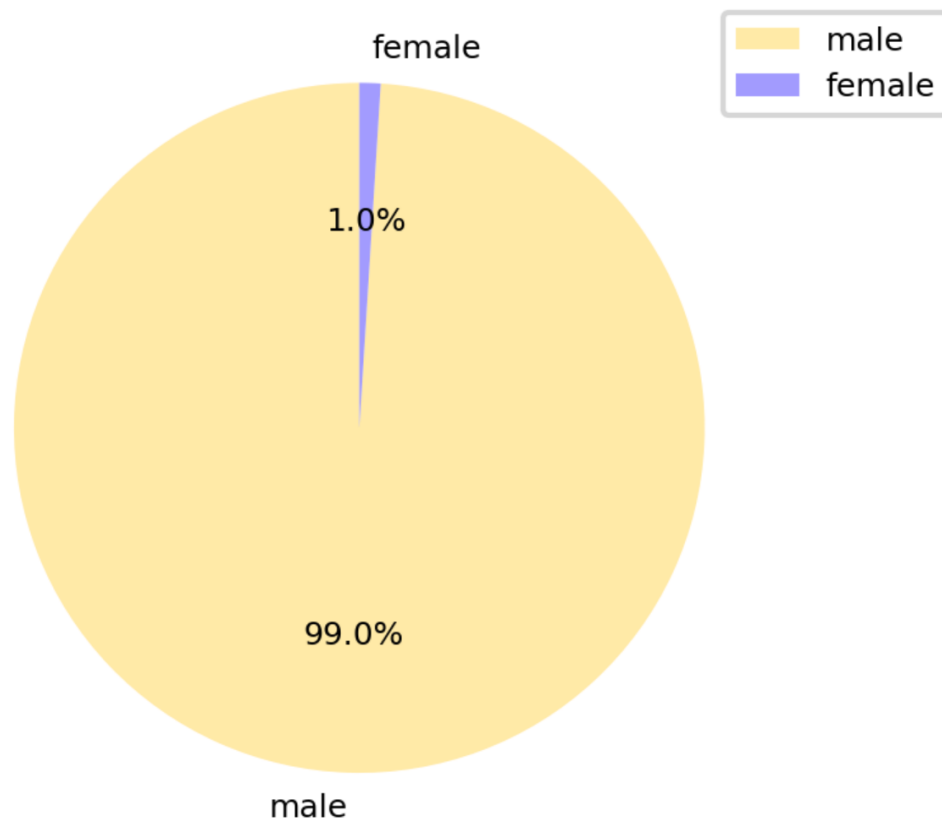
citizenship distribution among authors



Here we can see that the top five citizenship of the ancient book authors are Spain, France, Netherlands, Ancient Rome and Germany. The citizenship were mostly nearby countries instead of Belgium because Belgium as a country did not exist in the early 17th century. During this time period, the region that is now Belgium was part of the Spanish Netherlands, which was a territory in the Low Countries controlled by the Spanish monarchy. The Spanish Netherlands included present-day Belgium, Luxembourg, and parts of the Netherlands and France, which is the reason why Spain, France and Netherlands contributed to most of the author citizenship. It was not until the end of the 18th century that Belgium emerged as an independent nation, following the French Revolution and the subsequent breakup of the Holy Roman Empire.

Gender

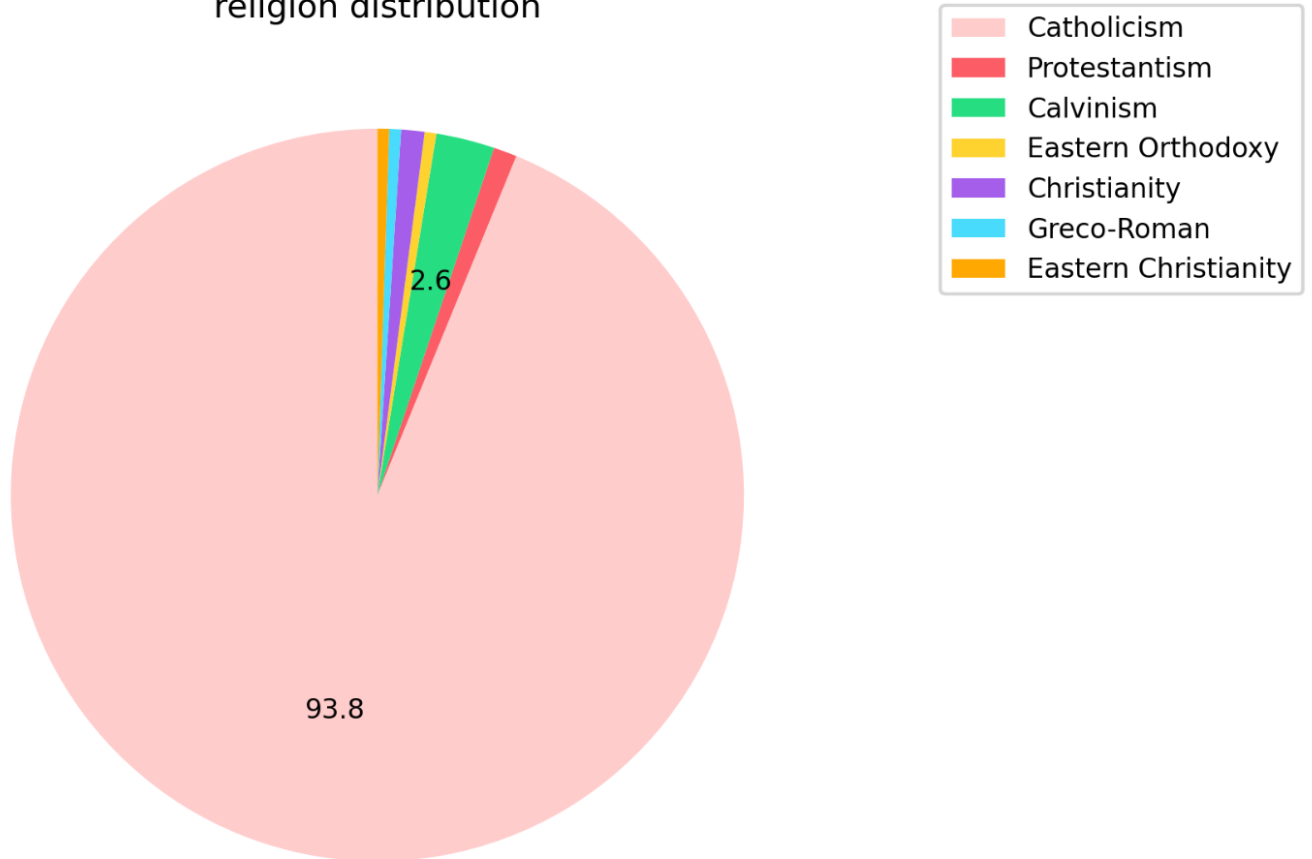
Gender distribution among authors



In the printed publication present at the Library of Leuven dating from 1601 to 1625, the male authors occupy 99% , while only 1% of the authors are female. In fact, the gender imbalance in the authorship of printed books in the early 17th century was not unique to Belgium, but was a widespread phenomenon throughout Europe. There are a number of factors that may have contributed to this imbalance, including social and cultural norms that discouraged or prohibited women from pursuing education and careers as writers, and the limited access to the publication fields. In many cases, women did not have the same access as men to the resources and networks necessary to produce and distribute printed materials. This may have made it more difficult for women to get their work published and disseminated.

Religion

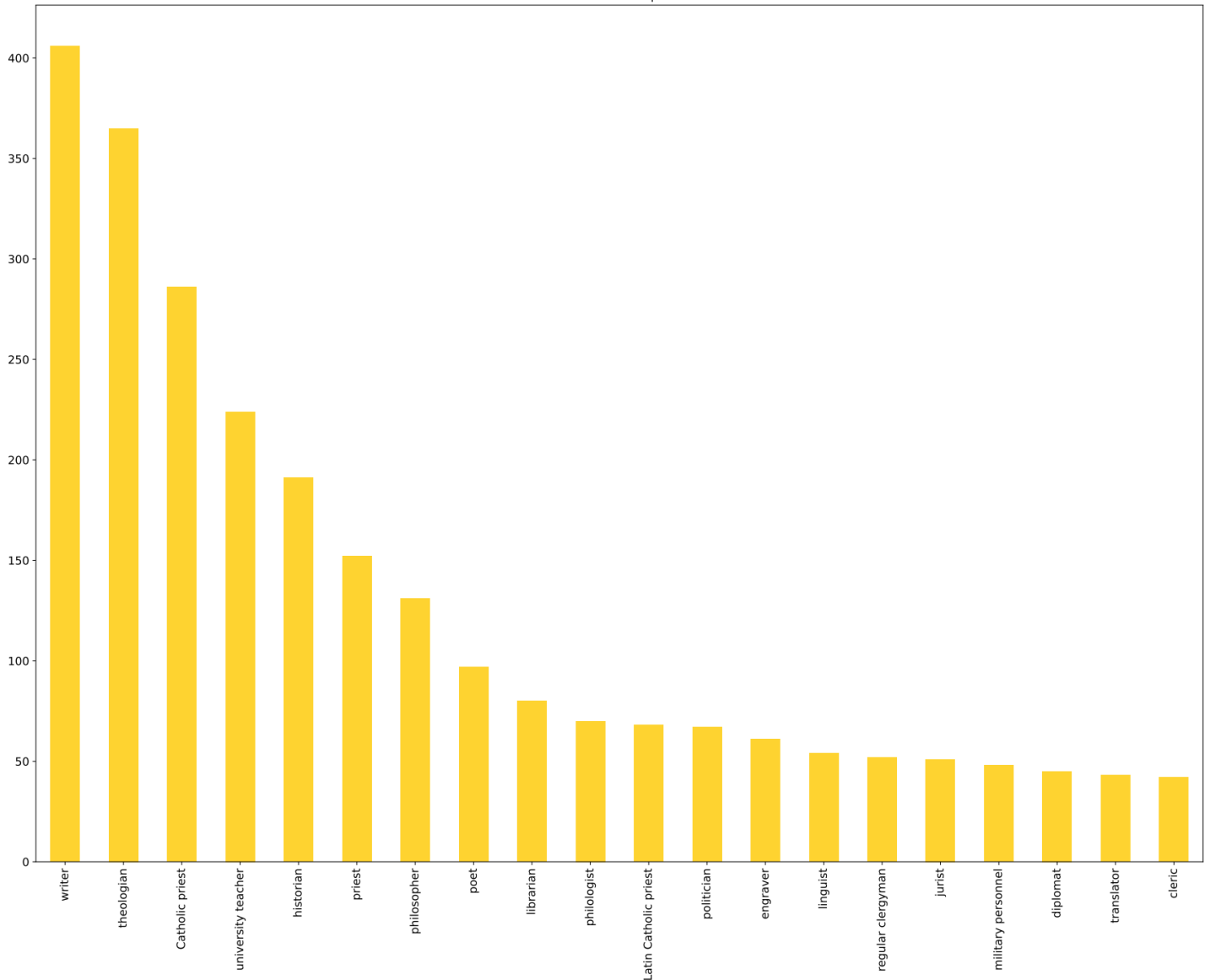
religion distribution



The authors were from a variety of religious traditions such as Catholicism, Protestantism, Calvinism, Eastern Orthodoxy, Greco-Roman religion and so on. This suggests that there was a diverse religious landscape in Belgium. But the religious belief was dominant by Catholicism, taking up 93.8% of all religions. This might be because during this time period, Belgium was a predominantly Catholic region, and it is likely that the vast majority of the population was Catholic. This may have made it more likely that the authors of these books were also Catholic. In addition, the influence of the Catholic Church: The Catholic Church played a significant role in the cultural and intellectual life of Belgium during this time period, and it is likely that many authors were affiliated with the Church in some way.

Occupation

the authors' occupation



The top 20 authors occupations are writer, theologian, Catholic priest, university teacher, historian, priest, philosopher, poet, librarian, philologist, Latin Catholic priest, politician, engraver, linguist, regular clergyman, jurist, military personnel, diplomat, translator, cleric.

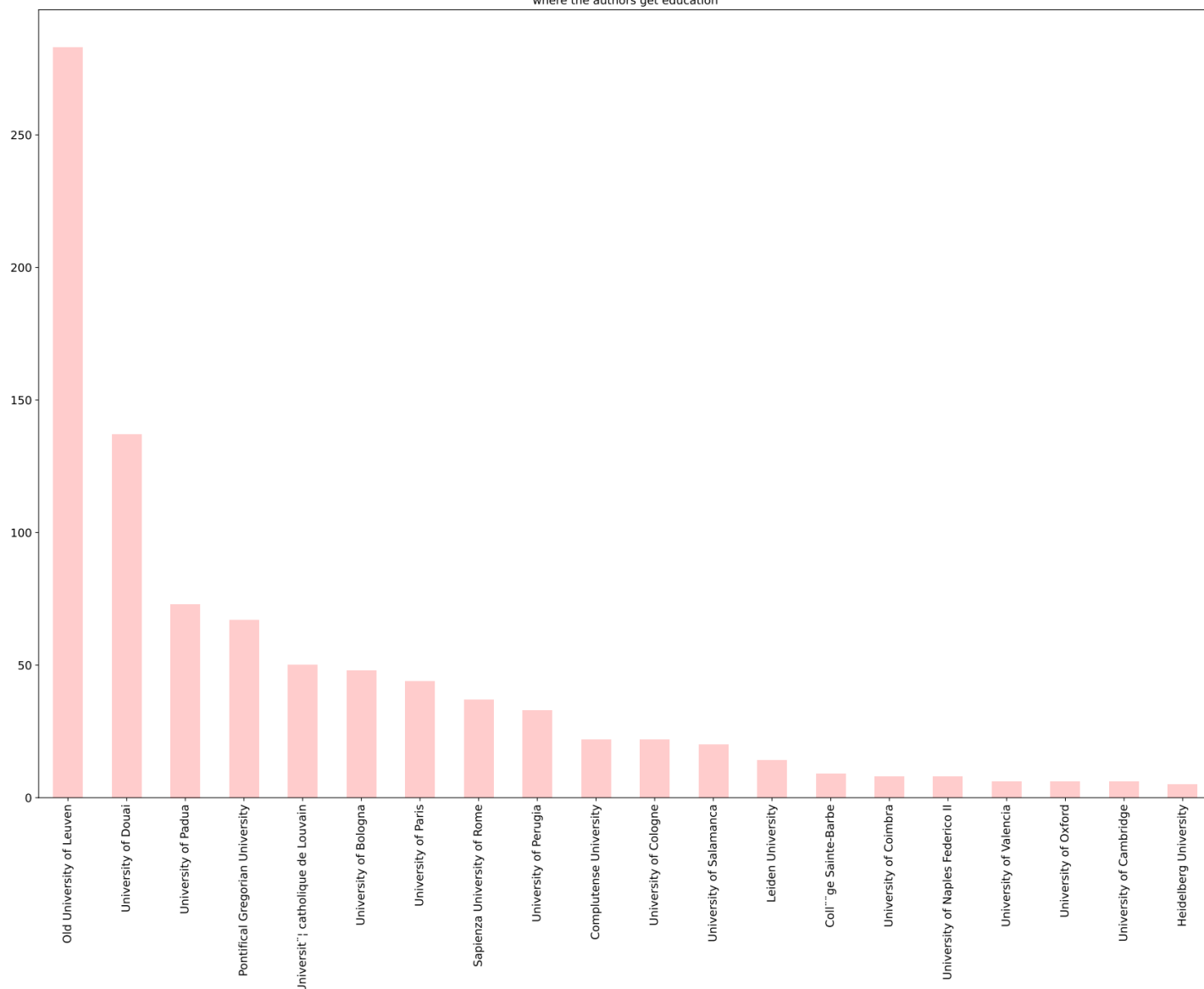
Some insights for the occupation distribution are listed as follows:

1. Intellectual and scholarly pursuits were important in the early 17th century. During this time period, there was a strong emphasis on intellectual and scholarly pursuits, and many authors were involved in academia or other fields that required advanced education and research skills. This may have contributed to the presence of occupations such as theologian, university teacher, historian, philosopher, and philologist among the authors represented in these books.

2. The Catholic Church had a great influence at that time. Many of the occupations listed, such as Catholic priest, regular clergyman, and cleric, are related to the Catholic Church. It is likely that many authors in Belgium had some involvement with the Church, which played a significant role in the cultural and intellectual life of the country.
3. There was a diverse range of industries within the publishing field. The publishing industry during this time period was a diverse field that included writers, poets, translators, and other professionals. This may have contributed to the presence of a wide range of occupations.

Education

where the authors get education



The authors are mostly educated in the following universities: Old University of Leuven, University of Douai, University of Padua, Pontifical Gregorian University, Université catholique de Louvain, University of Bologna, University of Paris, Sapienza University of Rome, University of Perugia, Complutense University, University of Cologne, University of Salamanca, Leiden

University, College Sainte-Barbe, University of Coimbra, University of Naples Federico II, University of Valencia, University of Oxford, University of Cambridge, Heidelberg University.

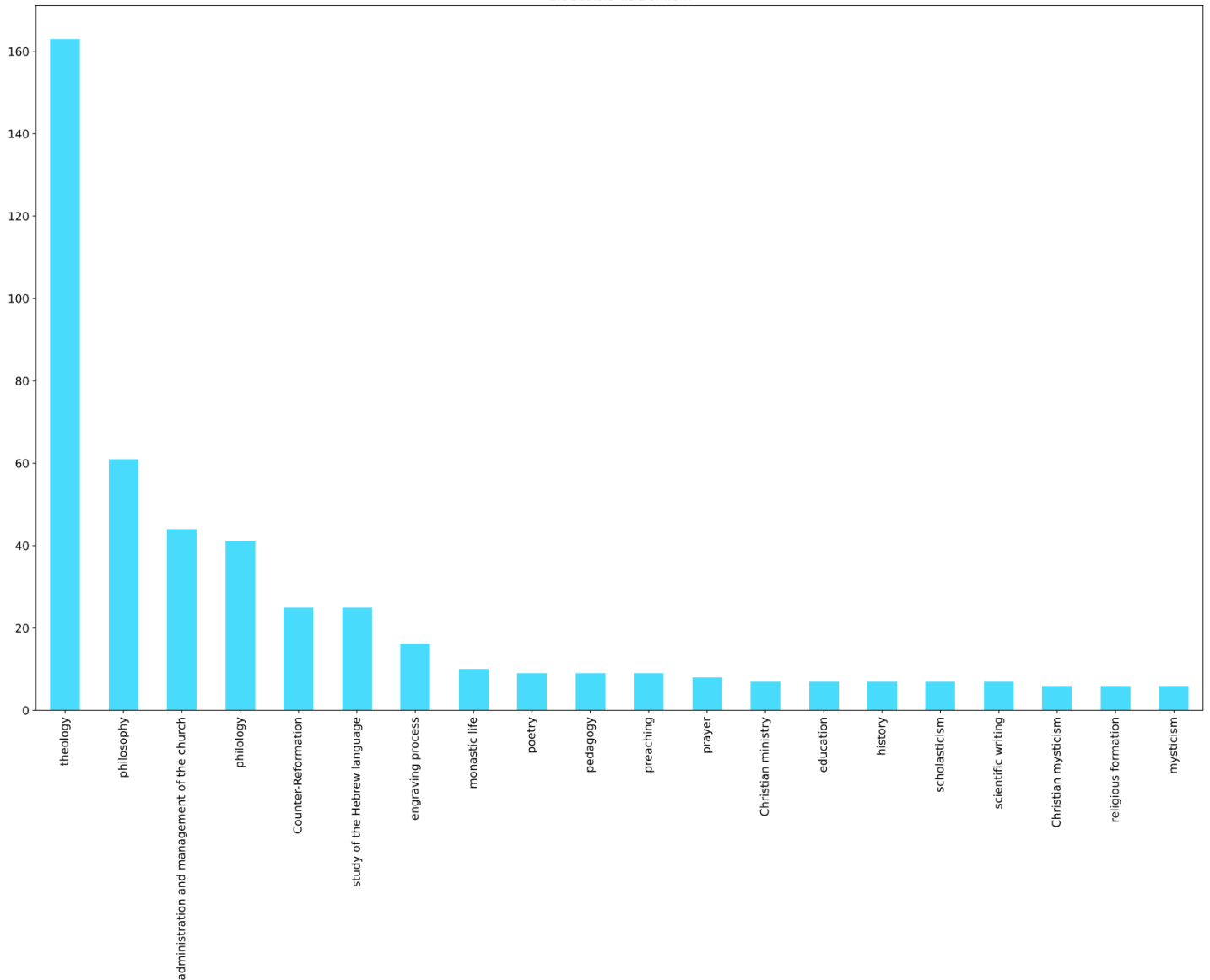
These are all universities that have a long history and are known for their contributions to education and research, which have played a key role in shaping the intellectual landscape of Europe and beyond.

There are a number of factors that may have contributed to the diverse educational backgrounds of the authors. Some possible reasons for this include:

1. The importance of higher education in the early 17th century: During this time period, higher education was highly valued and it was common for authors to have advanced degrees from universities. This may have contributed to the presence of a wide range of universities among the educational backgrounds of these authors.
2. The international nature of the publishing industry: The publishing industry during this time period was an international enterprise, with authors and publishers from different countries interacting and exchanging ideas. This may have contributed to the diverse educational backgrounds of the authors.

Field of work

the authors' field of work

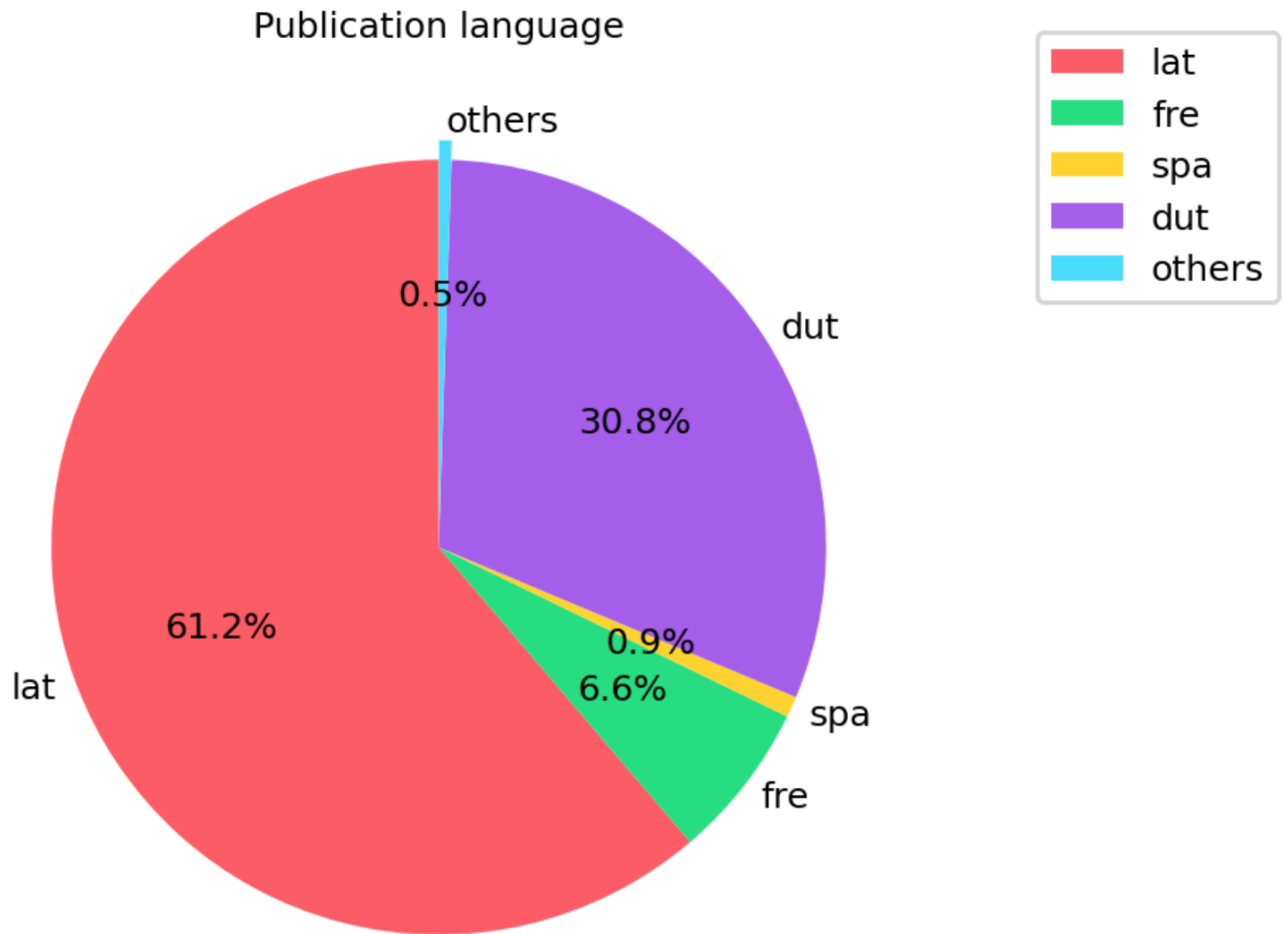


The authors are mostly in the field of work of theology, philosophy, administration and management of the church, philology, Counter-Reformation, study of the Hebrew language, engraving process, monastic life, poetry, pedagogy, preaching, prayer, Christian ministry, education, history, scholasticism, scientific writing, Christian mysticism, religious formation, mysticism.

We can see that many fields of work listed have strong religious overtones. Theology, administration and management of the church, Christian ministry, and Christian mysticism are all directly related to religion and the practices of Christianity. Other fields of work, such as prayer, preaching, and monastic life, also have strong religious connotations. Overall, it appears that many of the authors were involved in fields of work that had a strong religious focus.

b) Information about publication

Publication language

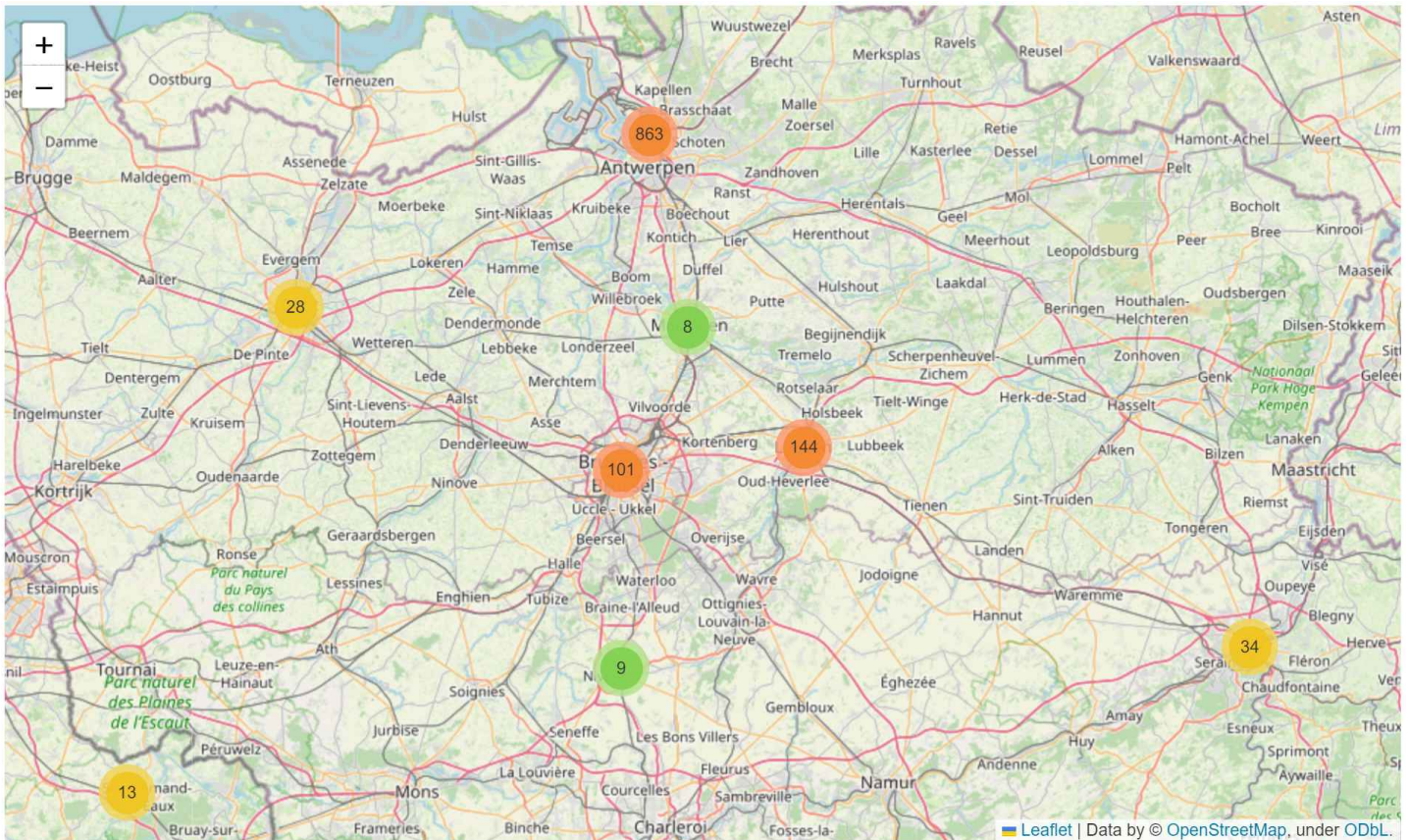


Here we can see that Latin language and Dutch contributed to approximately 90% of the publication languages. There are a number of factors that may have contributed to the dominance of Latin and Dutch as the languages of printed books in Belgium during the early 17th century. Some possible reasons for this include:

1. The dominance of Latin as a language of scholarship and higher education: During this time period, Latin was the dominant language of scholarship and higher education, and was widely used for the publication of scientific, philosophical, and literary works. This may have made it more likely that books published in Latin would be seen as more prestigious or influential.
2. The influence of the Catholic Church: Latin was the official language of the Catholic Church, and many books published in Belgium during this time period may have been religious texts intended for a Catholic audience. This may have contributed to the prevalence of Latin as a language of publication.

3. The use of Dutch as the language of everyday communication and commerce: Dutch was the dominant language spoken in Belgium during this time period, and was used for everyday communication and commerce. It is likely that books published in Dutch were more accessible to a wider audience and may have been more appealing to readers who were not fluent in Latin.

Publication location



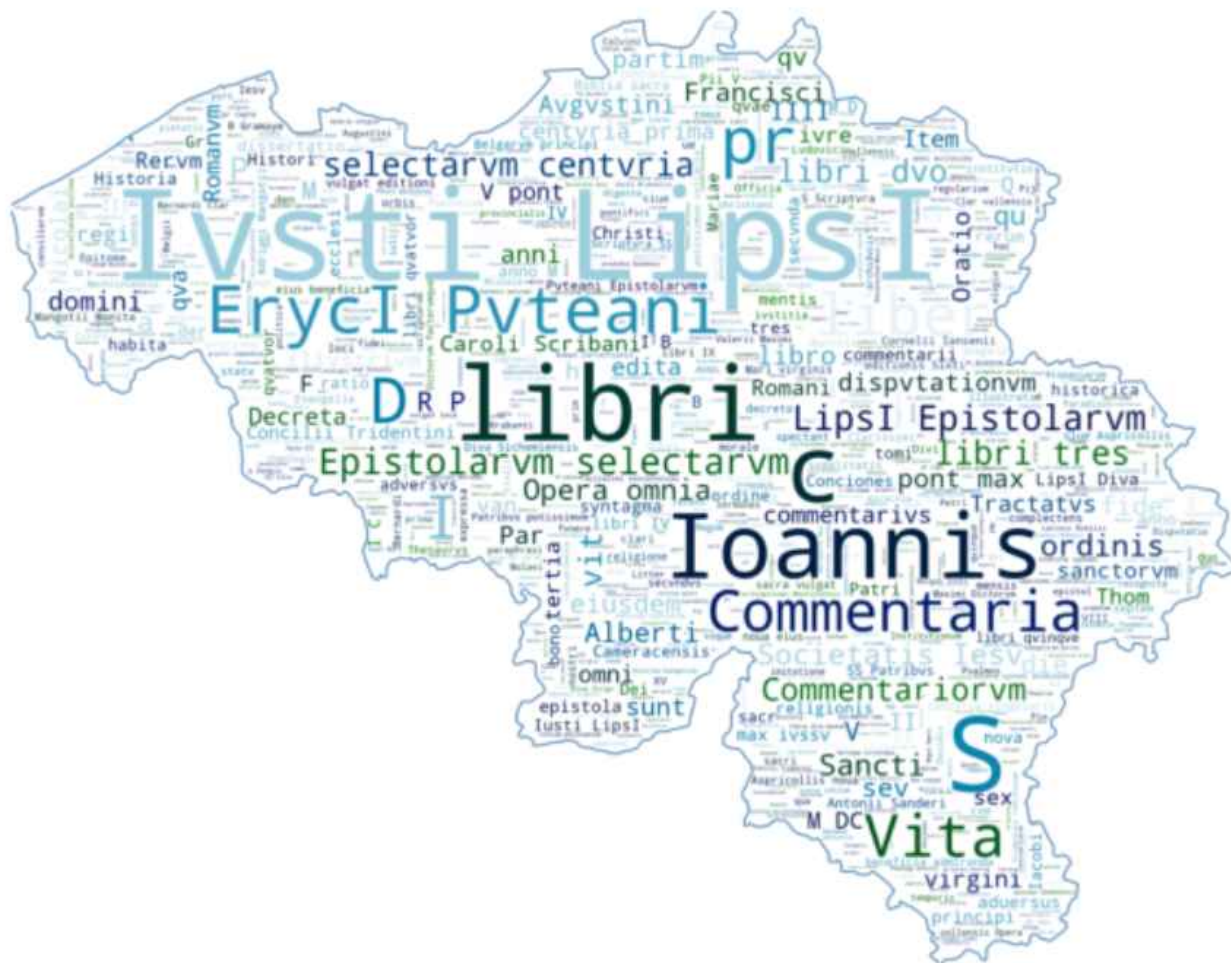
In this map we can see that the concentration of book production were in Antwerp, Leuven, and Brussels during the early 17th century. Some possible factors for this include:

1. The importance of these cities as centers of trade and commerce: Antwerp, Leuven, and Brussels were all major centers of trade and commerce during this time period, and it is likely that the publishing industry in these cities was supported by the economic prosperity of the region.
2. The presence of universities and other institutions of higher learning: Both Leuven and Brussels were home to important universities, which may have contributed to the concentration of book production in these cities. The presence of a well-educated population may have also made these cities more attractive to publishers.

ii) Linguistic analysis

From the analysis of publication languages above, we can see that these books were mostly published in Latin, Dutch and French, so I would focus on these three languages and conduct the linguistic analysis (mainly on the themes on the books).

a) Latin



As can be seen from the wordcloud, 'Ivsti Lipsi', 'Eryci Pvteani', 'Libri', 'Ioannis', 'Commetaria' appears a lot in the main title, which probably refer to peoples names and commentary. Then I took several complete titles to have a closer look at the books meaning.

L. Ivlii Flori Rerum a Romanis gestarvm libri IIII. A Ioanne Stadio emendati. ... Seorsvm excvsus In eos commentarius Ioannis Stadii ...

This means "The Four Books of the Deeds of the Romans by Lucius Julius Florus. Corrected by John Stadius. Separately printed commentary on these things by John Stadius."

Ivsti Lipsi sapienti? et litterarvm antistitis fama postuma

In Latin, "Ivsti Lipsi sapienti? et litterarvm antistitis fama postuma" means "Posthumous Fame of Justus Lipsius, Sage and Head of Letters." This phrase likely refers to a book that discusses the

reputation or legacy of Justus Lipsius, who was likely a scholar or intellectual known for his wisdom and expertise in literature. The phrase "fama postuma" suggests that the text is focused on Lipsius' reputation after his death.

Ivsti Lipsi Epistolarvm selectarvm centvria tertia ad Belgas.

This appears to be the title of a book that contains selected letters by Justus Lipsius, a 16th-century Flemish classical scholar, addressed to the people of the Netherlands (Belgians). "Ivsti Lipsi Epistolarvm selectarvm centvria tertia" translates as "The Third Century of Selected Letters by Justus Lipsius," and "ad Belgas" means "to the Belgians." The book or publication appears to contain a selection of letters by Justus Lipsius that are addressed to the people of the Netherlands.

Vita beatae Mariae Virginis

"Vita beatae Mariae Virginis" means "Life of the Blessed Virgin Mary." This phrase likely refers to a book or other text that tells the story of the life of the Virgin Mary, who is an important figure in Christianity.

Ignatii Loiol? vita, postremo recognita.

"Life of Ignatius Loyola, Recently Revised." This phrase likely refers to a book or other text that presents the life story of Ignatius Loyola, who was a Spanish priest and the founder of the Jesuit order. The text has been revised or updated.

Commentariolvs de vitae ratione et martyrio octodecim cartvsianorvm qvi in Anglia sub rege He[n]rico VIII. ob ecclesi? defensionem ac nefarii schismatis detestationem crudeliter trucidati sunt. [...] Vna cum noua historica relatione duodecim martyrum Cartusianorum Rur?mundensium qui anno M.D.DXXII. [!] angonem suum compleuerunt.

This title means "A Commentary on the Way of Life and Martyrdom of the Eighteen Carthusians Who in England Under King Henry VIII Were Cruelly Slaughtered for the Defense of the Church and the Detestation of the Wicked Schism. [...] Together with a New Historical Account of the Twelve Carthusian Martyrs of Ruremunda Who in the Year 1522 Completed Their Struggle." This phrase likely refers to a book or other text that provides a commentary on the lives and deaths of 18 Carthusian monks who were killed in England under King Henry VIII for their defense of the Church and opposition to schism. The text also includes a new historical account of 12 Carthusian martyrs from Ruremunda who died in 1522.

Statuta consistorialia et reformatio judiciorum spiritualium civitatis, patri?, seu ditionis, & di?cesis Leodiensis, jam recens edita, & in justum ordinem digesta.

This title means "Consistorial Statutes and Reform of the Spiritual Courts of the City, Province, or Dominion, and Diocese of Liège, Recently Published and Arranged in Proper Order." This phrase likely refers to a book or other text that contains statutes and reforms related to the spiritual courts in the city, province, or dominion of Liège and the diocese of Liège. The text has recently been published and arranged in a proper order.

Vita B.P. Ignatii qui religionem clericorum Societatis Iesu instituit

This title means "Life of the Blessed Priest Ignatius Who Established the Religious Order of the Clerks of the Society of Jesus." This phrase likely refers to a book or other text that tells the story of the life of the Blessed Priest Ignatius, who is also known as St. Ignatius of Loyola. Ignatius was the founder of the Jesuit order, a religious order of priests and brothers within the Roman Catholic Church.

From the typical titles above, some conclusions about the themes of the books can be drawn as below.

- Many of the titles refer to texts that discuss religious or spiritual topics, such as the lives of saints, the spiritual life and its perfection, and the virtues and vices of princes.
- Some of the titles refer to texts that contain advice or guidance on political or civil matters, such as politics or civil doctrine, the authority of a prince, and the virtues and vices of princes.
- A few of the titles refer to texts that provide commentary or analysis on historical events or figures, such as the deeds of the Romans, the life and martyrdom of Carthusian monks, and the life of Saint Norbert.
- Some of the titles refer to texts that have been recently revised or updated, or that include additional notes or commentary.

b) Dutch



From this wordcloud, 'oft', 'stadt', 'Gheboden', 'Antwerpen', 'leven', 'vanden', 'by mijnen' are highly emphasized. Through these city names, religious terms, and old word form, we can have an overall idea that these book have something to do with the local cities and religious belief, and we could also see the evolution of Dutch language. Here I also took several examples to illustrate the point.

De seuen ghetijden van onse lieve Vrouwe, ... met de seven psalmen, vigilien voor de dooden, ende meer andere schoon ghebeden.

This sentence means "The seven hours of our dear Lady, ... with the seven psalms, vigils for the dead, and other beautiful prayers." The wording of the sentence suggests that it is written in an old or archaic version of Dutch. The use of "ghetijden" for "hours" and "ghebeden" for "prayers" are characteristic of older Dutch writing. The word "Vrouwe" means "Lady" and is a term used to refer to the Virgin Mary, which indicates this book could be related to a church prayer.

Costvymen der stadt van Loven, ende van haeren ressorte.

This phrase means "Costumes of the city of Louvain, and of its jurisdiction." The word "costvymen" is an older spelling of "costumes," and the use of "stadt" for "city" and "haeren" for "their" are characteristic of older Dutch writing.

Cathollicke sermoonen oft verclaringhen op alle de epistelen ende euangelien vanden gheheelen Vasten.

This sentence means "Catholic sermons or explanations on all the epistles and gospels of the entire Lenten season." The wording of the sentence also suggests that it is written in an old or archaic version of Dutch. The word "Cathollicke" is an older spelling of "Catholic," and the use of "ghe" before certain words is a characteristic of older Dutch writing. The word "vanden" is also an archaic way of saying "of the."

Gheboden ende wt-gheroepen by mijnen heeren ... der stadt van Antwerpen, op den xxiiij. decembris, 1619. Men laet weten ende ordonneert van 's heeren ende deser stadts wegen, dat een yeghelijck vande borgheren ende inghesetenen deser stadt sal schuldigh ende ghehouden zijn te betaelen den staeten impost op't vee ...

This sentence means "Commanded and called forth by my lords ... of the city of Antwerp, on the 24th of December, 1619. It is announced and ordained on behalf of the lord and the city that each of the citizens and inhabitants of this city shall be obliged and bound to pay the state tax on the livestock ... " The use of "gheboden" for "commanded" and "gheroepen" for "called forth" are characteristic of older Dutch writing. The phrase "by mijnen heeren" means "by my lords".

Based on these titles, it appears that the ancient books contain Catholic sermons, explanations and prayers, and possibly regulations or decrees issued by the city government, and the proclamation to inform the public. What's more, the books may also contain information about the costumes or traditions of the Belgium cities.

c) French

This title would read something like "Charters, statutes, and ordinances of police, of the city of Ath." This title seems to refer to a book that contains legal documents or regulations related to the city of Ath, specifically in regards to police or law enforcement. The word "chartes" means "charters" in French, "statuts" means "statutes", and "ordonnances" means "ordinances".

Chroniques des dvcs de Brabant,

This title would read something like "Chronicles of the dukes of Brabant." This title seems to refer to a book that contains a historical record or account of the dukes of Brabant, which was a historical region located in what is now Belgium.

La serenissime infante dv ciel, ov La vertv triomphante dv vice, declarée par xxv. discours & sermons prononcés en diuers lieux,

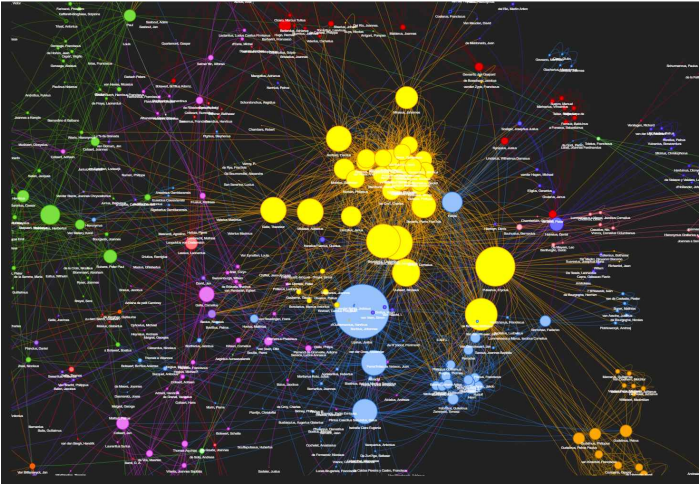
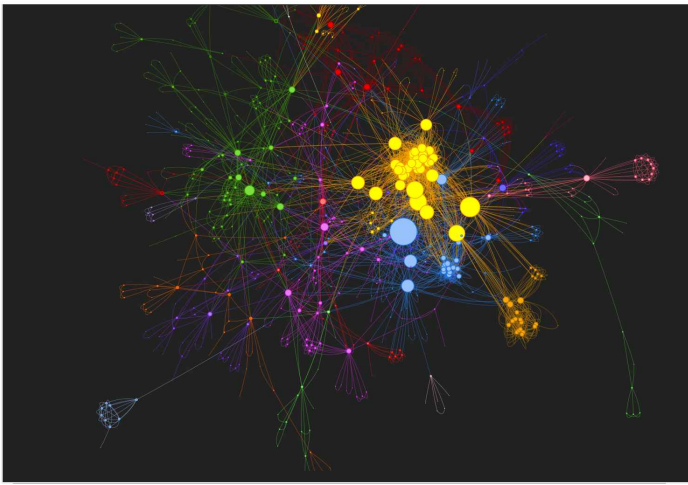
This title would read something like "The most serene infant of heaven, or Virtue triumphant over vice, declared through 25 discourses and sermons pronounced in various places". This title seems to refer to a book that contains a collection of 25 discourses or sermons on the theme of virtue triumphing over vice.

La vie, histoire, et miracles de la S. vierge et martyre de Iesv-Christ sainte Alene, reposant av covvent et cloistre de Forest, prés la ville de Bruxelles .

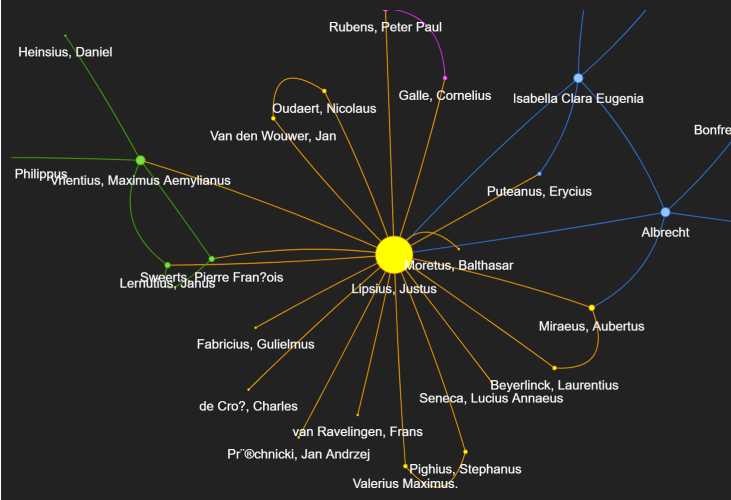
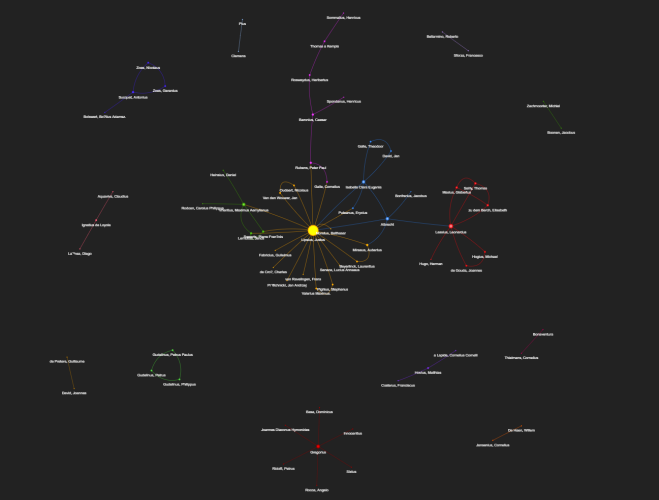
"The life, history, and miracles of the holy virgin and martyr of Jesus Christ, Saint Alena, resting in the convent and cloister of Forest, near the city of Brussels." This title seems to refer to a book that contains a account of the life, history, and miracles of a saint named Alena, who is described as a virgin and martyr of Jesus Christ. The book also mentions that Saint Alena is associated with a convent and cloister located in the town of Forest, near Brussels.

From these examples above, we could see a similar pattern with the former two languages. These books likely deal with a variety of subjects, including religious themes, legal documents, historical accounts, and ethical or moral issues.

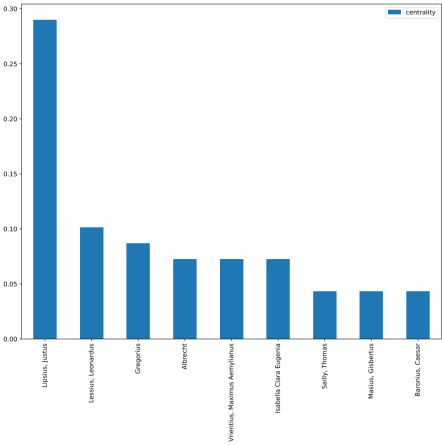
iii) Social network analysis



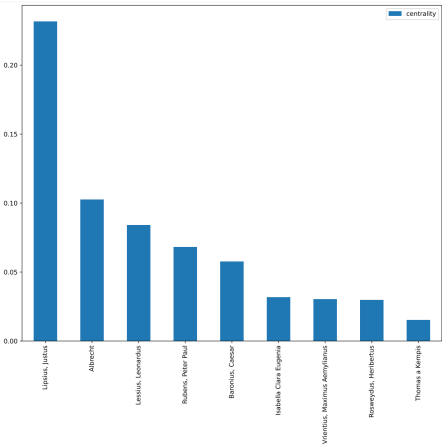
Since the whole network is too huge to be analyzed, and the lines were messy and intersected with one another, I selected the relationship between authors who have cooperated with each other for more than 3 times. The results are listed as follows.



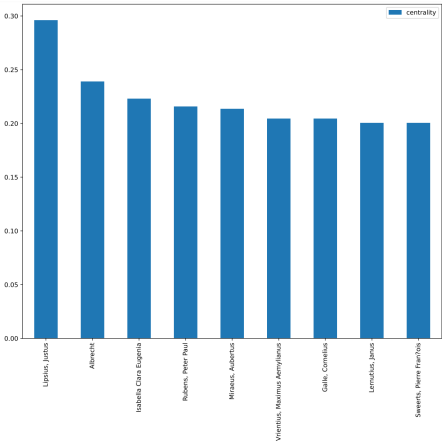
Social Network of authors



i. Degree Centrality



ii. Betweenness Centrality



iii. Closeness Centrality

From the graph and charts shown above, it seems that Justus Lipsius, Leonardus Lessius, Isabella Clara Eugenia, Albrecht and Vrientius, Maximus Aemylianus were all well-connected individuals within the social network of authors in Belgium in the early 17th century. Their high ranking in terms of degree centrality, betweenness centrality, and closeness centrality suggests that they had many connections within the network, were able to facilitate communication between other individuals in the network, and were able to reach other individuals in the network relatively quickly. This could indicate that they were influential figures within the author community and may have played important roles in the sharing of ideas and information.

Information about the prominent people:

1. **Justus Lipsius** (also known as Justus Lips) was a Flemish humanist and scholar who was active in the late 16th and early 17th centuries. He was born in 1547 in the town of Overijse, near Brussels, and studied at the University of Leuven before moving to the University of Paris to continue his studies. Lipsius is best known for his contributions to the fields of classical studies and philosophy, and he is considered one of the leading figures of the Northern Renaissance. Lipsius was a prolific writer, and his works cover a wide range of topics, including classical literature, philosophy, politics, and theology. Some of his most famous works include "De Constantia" ("On Constancy"), "De Militia Romana" ("On Roman Military Affairs"), and "Politicorum sive Civilis Doctrinae Libri Sex" ("Six Books of Politics or Civil Doctrine"). Lipsius is also known for his contributions to the development of Neo-Stoicism, a philosophical movement that drew inspiration from the teachings of the ancient Greek philosopher, Zeno of Citium. He died in 1606 in Leuven, Belgium.
2. **Leonardus Lessius** was a Belgian Jesuit theologian and moral philosopher who was active in the late 16th and early 17th centuries. He was born in 1554 in the city of Antwerp, Belgium, and studied at the University of Leuven before joining the Society of Jesus in 1572. Lessius is best known for his contributions to moral theology, and he is considered one of the leading figures of the Jesuit School of moral theology. Lessius' most famous work is "De justitia et jure" ("On Justice and Law"), a treatise on moral theology that was widely read and influential in the early modern period. In this work, Lessius discusses a wide range of topics, including natural law, the virtues and vices, the nature of justice, and the foundations of moral action. He died in 1623 in Antwerp, Belgium.

3. **Isabella Clara Eugenia** was a Spanish infanta (princess) who was the daughter of King Philip II of Spain and his fourth wife, Anna of Austria. She was born in 1566 in Madrid, Spain, and was the older sister of King Philip III of Spain. Isabella Clara Eugenia is best known for her role as co-regent of the Spanish Netherlands, a region that included modern-day Belgium and Luxembourg, from 1598 until her death in 1633. As co-regent of the Spanish Netherlands, Isabella Clara Eugenia played a significant role in the political and cultural life of the region. She worked to strengthen the Catholic faith in the region and to maintain Spanish control over the territories, which were frequently threatened by the Dutch Revolt and other conflicts. Isabella Clara Eugenia also supported the arts and promoted the development of trade and industry in the Spanish Netherlands. She died in 1633 in Brussels, Belgium.
4. **Albrecht of Nassau-Siegen**, a German nobleman and writer who was active in the early 17th century. Albrecht of Nassau-Siegen was born in Siegen, Germany, in 1559, and served as the governor of the Spanish Netherlands from 1609 until his death in 1634. He was known for his works on military strategy and tactics, and he wrote several books on the subject, including "De arte militari libri tres" ("Three Books on Military Art") and "Methode van te wercken by den slinger" ("Method of Working with the Sling"). Albrecht of Nassau-Siegen was also known for his military campaigns against the Dutch Republic, and he played a significant role in the Eighty Years' War between the Dutch and the Spanish.

3. Assessment on whether the structure/cleaning status of the dataset was suited to the task or whether additional manipulations were necessary

The cleaning status was not entirely suited to the task and therefore I added some additional manipulations to make the data feasible to be analyze.

First, the publication location column 264 has not yet been clustered and was a bit messy, with different transcription which refers to one place, for example 'Tot Brvessel', 'Tot Bruvssel', 'Tot Brvssele', 'Bruxelles' and 'Brvxelles' all refers to 'Brussels', so it took me some efforts to cluster the location with the cluster function in OpenRefine and manually.

Second, the publication language in column 41 was not extracted, so then I used the regular expression to extract the publication language, original language and middle language.

Third, the separation of column 245 is too detailed. To be concise, there is no need to split the column 245 into '245\$0\$0\$a', '245\$0\$2\$a', '245\$0\$4\$a', '245\$1\$0\$a', '245\$1\$2\$a', '245\$1\$3\$a', '245\$1\$4\$a' because all of them refers to main title according to the document of the

bibliographic record. So I used regular express to split the column again into main title, subtitle, and author names from title.

And finally, the structure of author information in column 700 is not desired since we have extracted the column to '700\$0\$ \$a' and '700\$1\$ \$a' seprately, which both contain the information about name of the author. Also we didn't add columns from the reconcile values, so I added them seprately to the author names which we've extracted from column 700, and then combined the two dataframes together later in pandas. Thankfully python pandas and other modules are powerful data analysis tools, which have infinite possibility to transform the data to the way we want.