



AY: 2020/21

CIS7030 - Geospatial Analysis - 20 Credit Hours

Term 1

Module Leader: Angesh Anupam

Assessment Brief

Assessment Title:  
**Mapping Global GDP**

WRIT1 100 %

HAND-OUT DATE: 2<sup>nd</sup> December 2020

HAND-IN DATE: 22<sup>nd</sup> January 2021

## Contents

Learning Outcomes .....	3
Assessment Requirements / Tasks (include all guidance notes) .....	3
Assessment Criteria.....	6
Submission Details .....	6
Feedback .....	6
Marking Criteria .....	7
Additional Information .....	9
Referencing Requirements (Harvard) .....	9
Mitigating Circumstances .....	9
Unfair Practice.....	9

## Learning Outcomes

This assessment is designed to demonstrate a student's completion of the following Learning Outcomes:

- Demonstrate an understanding of concepts underlying geospatial analysis and apply them on real life data.
- Carry out social analytics in combination with geospatial data, applying appropriate techniques on social information.
- Design, prototype and implement geospatial applications.
- Identify and describe emerging technologies and research areas relevant to geospatial analytics.

## Assessment Requirements / Tasks (include all guidance notes)

### **1.1 Review on different techniques used for geospatial analysis and social media information analysis**

Please perform a detailed review on the following applications,

- QGIS
- Open Street Map
- Twitter
- GeoPandas

You are free to use the available resources (academic papers, articles, official documentation etc.) for your research however the sources must be cited appropriately. Your review should cover the following aspects of **each** application,

- Brief introduction
- Functionality
- Common use in different areas (business, social study, public health etc.)
- Strengths and limitations

### **1.2 Report on the importance of geospatial analysis in different areas and how these areas are benefiting from geospatial analysis.**

Among the prominent areas of applications for geospatial analysis – Sustainable Development, Public Safety, Health & Human Services, Transportation, and Education **choose** any **THREE** areas. You can find the details about these areas of applications through the URL, <https://www.esri.com/en-us/industries/>. Write a report, explaining current state, what are the challenges, what solutions are available and the future direction.

The solutions for the Task 1.1 and Task 1.2 **MUST** be presented in a single PDF document.

## 2.1 Apply geospatial visualisation tool (e.g. GeoPandas) on the dataset provided

This task requires you to use the two datasets (world population and world GDP) accessed from the World Bank. Both of these datasets are available on the Moodle under the Assessment folder. Use the GeoPandas or similar visualisation tool to plot a set of choropleth maps representing the world GDP per capita for the years 1995, 2005, and 2015 respectively. This task requires you to use both the datasets simultaneously for calculating the GDP per capita.

The solution for this task should describe all the major steps taken for generating the choropleth maps. If a Python based tool like GeoPandas is used then the solution should be in a Jupyter notebook form (.ipynb), wherein all the functions, libraries and coding steps should be explained in a lucid manner. In this case, the major steps for generating the choropleths would typically involve, importing the datasets using appropriate Python libraries, data cleaning, geospatial operations, and plotting. The Jupyter notebook should be able to reproduce the choropleth maps without any error. If some other non-Python based visualisation tools are used, then the solution for this task should include a written description about the major steps undertaken for generating the choropleth maps as well as an appropriate number of supporting screenshots should also be presented.

## 2.2 Analyse the datasets and answer specific questions. For plotting within this section, you can use any visualisation tool.

- For year 2015, plot the GDP per capita for only the countries having population greater than 300000000. Very briefly interpret the generated plot.
- For year 2015, plot the GDP per capita for only the countries having population less than 70000000. Very briefly interpret the generated plot.
- For year 2015, plot the GDP per capita for only the countries having gross GDP between 450000000000 US Dollar and 8920000000000 US Dollar. Very briefly interpret the generated plot.
- What is the percentage change in the GDP per capita from 1995 to 2015, for the country having the highest population in 2015?
- Plot the mean per capita GDP (from 1995 to 2015) of all the countries. Very briefly interpret the generated plot.
- Present a correlation plot between mean population of each country and mean per capita GDP (from 1995 to 2015). Very briefly interpret the generated plot.

**NOTE:** For the Task 2.2, all the geospatial plots can be presented using choropleth maps or even using simpler heat maps. If a heat map is used for the visualisation then the countries names must clearly be visible on the plots.

The solution for the Task 2.2 should be presented in a Jupyter notebook (.ipynb), if a Python based tool is used. All the functions, libraries and coding steps should be explained in a lucid manner. The notebook should run without any error and all the results should easily be reproducible. Your brief interpretation about the generated plots should also be contained in this Jupyter notebook. If some other non-Python based visualisation tools are used, then the solution for this task should include a written description about the

major steps undertaken for generating the plots as well as an appropriate number of supporting screenshots should also be presented.

### **2.3 Social analytics**

In this task, you will apply sentiment analysis to Twitter data using the Python libraries TextBlob and Tweepy. Your analysis should cover the following major steps:

- Get 500 tweets on the topic, #Lockdown or #CovidLockdown with a Python script.
- Clean the tweets. Such as, removal of URLs from the tweets.
- Calculate the polarity values of the individual tweets and present them using a suitable visualisation such as, histogram.
- Analyse the public sentiments about the chosen topic (#Lockdown or #CovidLockdown) based upon the polarity values and make your recommendation about any future lockdown measures based upon the performed analysis.

The solution for the Task 2.3 should include a Jupyter notebook (.ipynb) describing all the major steps performed during the analysis. All the functions, libraries and coding steps should be explained in a lucid manner. The notebook should run without any error and all the results should easily be reproducible. Your interpretation about the results and recommendation for any future lockdown measures should also be contained in this Jupyter notebook.

## Assessment Criteria

<b>Part 1: Review/Report</b>	<b>35%</b>
1.1 Review on different techniques used for geospatial analysis and social media information analysis.	20%
1.2 Report on the importance of geospatial analysis in different areas and how these areas are benefiting from geospatial analysis.	15%
<b>Part 2: Application/Implementation</b>	<b>65%</b>
2.1 Apply geospatial visualisation application (e.g. GeoPandas) on the dataset provided.	20%
2.2 Analysing the dataset and answer specific questions.	30%
2.3 Social analytics.	15%

## Submission Details

Please see Moodle for confirmation of the Assessment submission date.

Submission will be by **4:00pm** on the deadline day.

**Any assessments submitted after the deadline will not be marked and will be recorded as a Non-Attempt.**

The assessment must be submitted as a zip file document through the Turnitin submission point in [Moodle](#). All the separate file (.pdf/ .ipynb etc.) corresponding to the various tasks (Task 1.1, 1.2, 2.1, 2.2, and 2.3) must be merged together as a single zip file.

Your assessment should be titled with your Student ID Number, module code and assessment id, e.g. st12345678 CIS7030 WRIT1

## Feedback

Feedback for the assessment will be provided electronically via [Moodle](#), and will normally be available 4 working weeks after initial submission. The feedback return date will be confirmed on Moodle.

Feedback will be provided in the form of a rubric and supported with comments on your strengths and the areas which you can improve.

All marks are preliminary and are subject to quality assurance processes and confirmation at the Examination Board.

Further information on the Academic and Feedback Policy is available in the Academic Handbook ([Vol 1, Section 4.0](#))

## Marking Criteria

<b>70 – 100% (Distinction)</b>	A strong theme is developed. Well formulated structure. Very few mistakes. Clear well punctuated sentences. Writing style clear and informative without being verbose. Demonstrates an in depth understanding of the techniques used for geospatial analysis, social media information analysis and importance of geospatial analysis in different areas. Evidence of wide range of appropriate, quality sources used, including appropriate academic journals and books. Clear ability to evaluate quality of sources. Quotations used appropriately and sparingly. All sources cited with no errors. Standard referencing style used with no (or minimal) errors/omissions. Fully working application that demonstrates excellent understanding of the Geospatial analysis and social analytics techniques with excellent justification. Able to utilise geospatial analysis tools for plotting, analysing data, with an excellent understanding of modelling of real-world problems with social information integration.
<b>60-69% (Merit)</b>	A clear theme is developed. Well written, clearly designed, containing some spelling mistakes. Demonstrates an understanding of the techniques used for geospatial analysis, social media information analysis and importance of geospatial analysis in different areas. Evidence of reading minimal amount of relevant publications (books/journals/web sites) of appropriate quality. Shows some ability to evaluate quality of sources. Citations attempted; most sources cited appropriately in the text. Some errors in use of standard referencing style. Fully working application that demonstrates a good understanding of the Geospatial analysis and social analytics techniques with a good justification. Able to utilise geospatial analysis tools for analysing data, with a good understanding of modelling of real-world problems with social information integration.
<b>50-59% (Pass)</b>	Clear structure to work. Suggests some understanding of the techniques used for geospatial analysis, social media information analysis and importance of geospatial analysis in different areas. However, it is accompanied with significant omissions. Some spelling mistakes. Basic sentence construction rules followed. Evidence of reading minimal amount of relevant publications (books/journals/websites). Some attempt made at evaluating quality of sources. Citations attempted; key sources cited; may include some errors. Correct referencing standard attempted, but with many errors. Clear message presented but contains errors that would have a significant impact. A working application that demonstrates some understanding of the geospatial analysis and social analytics techniques with a good justification. Able to utilise geospatial analysis tool for analysing data, with some understanding of modelling of real-world problems with social information integration.
<b>40-49% (Narrow fail)</b>	Some structure to the work. Reasonable discussion of the techniques used for geospatial analysis, social media information analysis and importance of geospatial analysis in different areas. Mostly appropriate level of discussion, but significant errors and omissions. Numerous spelling mistakes in the report. Contains some significant errors. Evidence of some research.

	Sources mainly websites and/or class notes. Limited ability to evaluate quality of sources. Citations attempted; with errors/ omissions. Incorrect referencing standard used, but with minor errors. A partially working application that demonstrates some understanding of the Geospatial analysis and social analytics techniques with or without justification. Able to utilise geospatial analysis tool for analysing data, with satisfactory understanding of modelling of real-world problems with social information integration.
<b>0-39% (Fail)</b>	Unclear structure. Does not show full understanding of the issues. Writing style unclear. Many spelling/grammatical mistakes. Limited understanding or requirements. Missing or no evidence of research. Copyright restrictions infringed. Few or no sources cited in the text. Standard referencing style not used. Non-working or poor application that demonstrates little understanding of the geospatial analysis and social analytics techniques with poor justification. Not Able to utilise geospatial analysis tool for analysing data, with little or no understanding of modelling of real-world problems with social information integration. No learning outcomes are met in full although there may be minimal attainment in relation to one or two.



## Additional Information

### Referencing Requirements (Harvard)

The Harvard (or author-date) format should be used for all references (including images).

Further information on Referencing can be found at Cardiff Met's [Academic Skills](#) website.

### Mitigating Circumstances

If you have experienced changes or events which have adversely affected your academic performance on the assessment, you may be eligible for Mitigating Circumstances (MCs). You should contact your Module Leader, Personal Tutor or Year Tutor in the first instance.

An application for MCs, along with appropriate supporting evidence, can be submitted via the following link to the [MCs Dashboard](#)

Applications for MCs should ideally be submitted as soon as possible after circumstances occur & at the time of the assessment. **Applications must be submitted before the relevant Examination Board.**

Further information on the Mitigating Circumstances procedure is available in the Academic Handbook ([Volume 1, Section 5](#))

### Unfair Practice

Cardiff Metropolitan University takes issues of unfair practice **extremely seriously**. The University has distinct procedures and penalties for dealing with unfair practice in examination or non-examination conditions. These are explained in full in the University's Unfair Practice Procedure (Academic Handbook: [Vol 1, Section 8](#))

Types of Unfair Practice, include:

**Plagiarism**, which can be defined as using without acknowledgement another person's words or ideas and submitting them for assessment as though it were one's own work, for instance by copying, translating from one language to another or unacknowledged paraphrasing. Further examples include:

- Use of any quotation(s) from the published or unpublished work of other persons, whether published in textbooks, articles, the Web, or in any other format, which quotations have not been clearly identified as such by being placed in quotation marks and acknowledged.
- Use of another person's words or ideas that have been slightly changed or paraphrased to make it look different from the original.
- Summarising another person's ideas, judgments, diagrams, figures, or computer programmes without reference to that person in the text and the source in a bibliography or reference list.
- Use of services of essay banks and/or any other agencies.
- Use of unacknowledged material downloaded from the Internet.

- Re-use of one's own material except as authorised by the department.

**Collusion**, which can be defined as when work that has been undertaken with others is submitted and passed off as solely the work of one person. An example of this would be where several students work together on an assessment and individually submit work which contains sections which are the same. Assessments briefs will clearly identify where joint preparation and joint submission is specifically permitted, in all other cases it is not.

**Fabrication of data**, making false claims to have carried out experiments, observations, interviews or other forms of data collection and analysis, or acting dishonestly in any other way.