Danmarkskort

Gruppe 18:

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1 Introduction

2 Background and problem area

2.1 Problem area

Project Map of Denmark should function as a map application, who's purpose is to map the the entirety of Denmark. The program must be interactable and include features such and zooming and moving the map around. Furthermore the program should be able take to points or addresses and find thew shortest path from point to point, this functionality should work for both cars, bikes and walking pedestrians. The program should also include several customization options for the user for example allow the user to add points of interest, exclude certain object on the map (building, nature ect.) or toggle dark mode. All of these features should be packaged in a coherent graphical user interface, where the user can easily interact and perform the features as listed earlier.

2.2 Usability requirements

The projects usability requirements are based on the project requirements sent to us my the course supervisor. We have changed and added usability requirements as necessary.

ID	Function
1	The user must be able to display any part of a map by using the mouse to move around the given map.
2	The user must be able to zoom in and out of a given map.
3	The user must be able to customize a map-view by selecting which elements should be displayed on a given map.
4	The user must be able to find the name of any given point by hovering their mouse over a given point.
5	The user must be able to find a given address by inputting a string into a search-bar.
6	The user must be able to click on any point of the map have that point be an input in route-finding
7	The user must be able to find the shortest route between two points and/or addresses.
8	The shortest route should be given in a form that is easy to understand and can be copy-pasted as plain text to the clipboard.
9	The user must be able to find a route for cars, bikes and bikes based on what vehicle the user has selected.
10	The user should be able to add any selected point and/or address as a point-of-interest.
11	The user-interface should be consistent with a layout the user is familiar with. e.g Google maps, Apple maps etc.

2.3 System requirements

The system requirements for the project can be seen in the following table. Generally the program should be able to run on any given computer that the program can be expected to run on.

ID	System requirement
1	The program must be written in Java.
2	The program must use the JavaFX framework for the user interface.
3	The program must run smoothly for everyday use and loadtimes should not exceed what is to be expected for a given filesize.
4	The program must be able to load any given zipped .osm file.
5	The program must have a default run-file if no other map-file was given.
6	The program should adjust to the given windows size and zoom level to save memory.
7	The program must be able to differentiate between different cartographic elements and draw different elements for each cartographic element.

3 Analysis

4 User manual

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9.1 Problem description - Noun and Verb Method

The map show the roads, buildings and other cartographic landmarks within Denmark. The map is created from a .osm file embedded with the program, the user can also add another .osm file to load a map of their choosing.
Every cartographic landmark has a color, a number of tags and sub-tags, buildings have addresses and roads have names. Possible actions for the user are displayed with a user-interface, these actions include; searching, zooming, color-change and route-finding.
The User can search on addresses, possible matches to the searched address will be shown. Selected matches will display the location on the map. The user can draw a route between two searched adresses or by clicking on the map, a description on how to proceed through the route is displayed by text, the route is the shortest route and changes depending on the method of transportation, methods of transportation include car, bike and walking. Cars can travel through routes composed of streets and highways, bikes can travel through bike lanes and walking allows travel through sidewalks. The user can zoom in and out of the map and the level of the zoom is shown. The name of roads is displayed the user can hover the mouse cursor over the road. The user can change the color of the map and filter the Cartographic elements shown on the map. The map adapts the layout depending on the size of the window.

Noun	Verbs
roads	show
buildings	created
landmark	add
map	load
.osm file	actions
landmarks	displayed
color	searching
tags	zooming
sub-tags	color-change
addresses	route-finding
roads	search
names	searched
user-interface	shown
address	selected
route	display
description	draw
text	clicking
shortest route	changes
car	travel
bike	composed
walking	allows travel
cars	zoom
routes	change
location	filter
user	adapts
level	hover
sidewalks	
mouse cursor	
layout	
size	
window	
highways	
bikes	

9.2 Background/verb

In 2004 wiki launched OpenStreetMap which revolutionised the way we map the world. OpenStreetMap made it easier to get an overview over parts of the world and made it much easier to transform real life cartography into data. In Denmark, OpenStreetMap have been utilized by rejseplanen.dk to make it possible for customers of public transport to map and plan their journey ahead of time.
In contrast to Google Maps OpenStreetMap is open source which makes it much easier to manipulate for the individual user.
Technologies such as this have made it easier to make GPS solutions for cars, bicycles, cell phones etc. Before online maps people had to rely on physical books (which took up space, where heavy, and not handy too use) in order to plan their journey. Furthermore having the cartographic data on a pc expands the ease of usability for multiple applications. If you for instance want to calculate the distance between two different points on a map having the cartographic data on a pc makes it much easier to calculate compared to having to do it by hand. Having the data on a pc makes it much easier to compare multiple different ways between two points to calculate which one is the shortest.

9.3 Log

9.3.1 9. of March

We started the day off by talking about how far each group member had come in the previous handins, so we could get a general feel of how well-versed each group member was in the "source material". Afterwards we agreed that we should get Noun/Verb method and CRC-Cards done by friday, so we could push it to the Git repository. We also agreed that we should have agendas and goals for upcoming meetings.

9.3.2 16. of March

Agenda

- Update since last time
- What do to next?
- Do you next any help with your task?

Log
Update since last time
We all made our own CRC card drafts and then held a meeting to compare our drafts and find the final CRC cards we would need for our project. Nicolaj spent some extra time reading over previous handins to get a sense of the code we will need to expands upon later, while he did that Mikkel and Christopher spent some time reading over previous material to prepare for writing the background and problem area section of the rapport.

What do to next?
Mikkel will be writing the background and problem area section of the report before the next meeting, while Christopher will be focusing on creating a simple user interface for the program. Nicolaj will be updating our code with implementations on calculating zoom level and dynamic file reading. Tim and Jakob will be making implementations of KD-Trees so we can implement it in our own code next meeting.

Do you next any help with your task?
No one will be needing extra help.

Goals accomblished today
Today we manged to create several sub-goals and spread the workload equally between us.

9.3.3 23. of March

Agenda

- Update since last time
- What do to next?
- Do you next any help with your task?

Log
Update since last time
Tim and Jakob are both still busy looking at KD-trees. Nicolaj finished implementing zoom levels and file reading. Mikkel was sick both is still working on the report. Christopher made a user interface with different buttons.

What do to next?
Christopher will be making improvements to the user interface while Nicolaj will look into drawing optimization. Mikkel will finish the background and problem area part of the report. Tim and Jakob will continue working on KD-trees.

Do you next any help with your task?
No one needed help.

Goals accomblished today
Several improvement made to the currenct program.

9.3.4 30. of March

Agenda

- Update since last time
- What do to next?
- Do you next any help with your task?

Log
Update since last time
Tim has decided to stop at ITU and is no longer part of the group. Because of this we have still not yet implemented KD-trees. Mikkel was able to finish the background and problem area parts of the report and Christopher was able to finish the UX elements and had ssome time to make the file reading easier and more user friendly. Because of the trouble with KD-trees Jakob has made progress on coloring instead.

What do to next?
Jakob and Mikkel will be looking at KD-trees and will try to implement is before next week. Mikkel will also continue writing the report. Nicolaj and Christopher will be looking at route-finding and general improvement of our program.

Do you next any help with your task?
Jakob asked for help with KD-trees and Mikkel joined the KD-tree super team!

Goals accomblished today
First part of the report was finished! And we had a presentable program for today's presentations.

9.3.5 6. of April

Agenda

- Update since last time
- What do to next?
- Do you next any help with your task?

Log
Update since last time

What do to next?

Do you next any help with your task?

Goals accomblished today