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Assignment -3: Describe various types of mining software and their application in different mining operations.

\*What are Data Mining Software?

Data mining software refers to software that allows companies and other users to extract usable data from a large set of raw data to find correlation , patterns , and anomalies. The results of the data mining process help companies predict outcomes. The key techniques used by data mining software to mine data include statistical analyses, specific algorithms, machine learning, database statistics, and artificial intelligence.

The main goal of using these methods is to retrieve useful information from large dataset and transform it into a structure that is easy to understand and use when needed.In simple terms, data mining applications help companies gain insight from huge volumes of data and transform data into actionable information.

There are many data mining systems and some of them offer more advanced functionalities. Individual products also use different methods to process information and validate results. Therefore , your choice of data mining softaware will depend on your preferences or needs.

HERE ARE MANY SOFTWARE AND ITS APPLICATION: These are pointes below and further will be described.

1. Surfer
2. Vulcan
3. Corvus Axiom
4. EQWin
5. Earthworks on – screen
6. Reactore
7. IGantt

1.SURFER

**What is Surfer?**

Surfer is a full-function 2D and 3D mapping, modeling, and analysis software package for scientists and engineers. Surfer's sophisticated interpolation engine quickly transforms XYZ data into publication-quality maps. Virtually every aspect of the map is customizable. Enhance maps with profiles, legends, titles and labels, faults and breaklines, or external maps from any web mapping service. Surfer is used extensively by scientists, consultants, engineers, and many others across the globe.

Applications :

Analyze Data

Discover the depths of your data with Surfer’s numerous analysis tools. Adjust interpolation and gridding parameters, assess the spatial continuity of data with variograms, define faults and breaklines, or perform grid calculations such as volumes, transformations, smoothing, or filtering. Surfer quickly transforms your data into knowledge.

Communicate Results

Communicate your hard-earned findings with confidence. Whether it is for your project manager, thesis advisor, or client, Surfer facilitates a complete and thorough understanding of data.

The surfer is an ideal tool for all types of 3D modeling based on mappings, of all types of flat surfaces, especially for the creation of animations in three dimensions of land, with different contours and surfaces, thanks to this tool we can explore the land from our computer, and simulate work fields in this software.

Create Professional Maps-Easily communicate both simple and complex spatial data. Surfer gives you the tools to create high-quality maps to clearly deliver your message to coworkers, clients, and stakeholders.

Surfer Map Types

Contour,Base

Post,3D Surface

Color Relief,Classed Post

3D Wireframe,1-Grid Vector

2-Grid Vector,Watershed

Grid Value,Viewshed

Point Cloud

2. Vulcan

Maptek Vulcan software provides the mining industry with the most advanced 3D geological modelling, mine design and production planning solutions.More than 19,000 licenses of Vulcan are in use across the globe for applications ranging from exploration, through geological modelling, mine design and planning to rehabilitation. Intuitive tools help operations of all resource types and mining techniques improve productivity.

Applications:

Vulcan Geology

Geology tools allow geologists to assemble and view drillhole data, define geological zones, accurately model orebodies and deposits, and prepare resource reports.

Vulcan Explorer Bundle

Vulcan Geomodeller Bundle

Vulcan Geostatmodeller Bundle

Underground Digital Mapping New

Vulcan Open Pit Mine Planning

Mine planners use Vulcan to design, evaluate and maintain daily operations, taking into account economic, technical and operational parameters.

Vulcan MineModeller Open Pit Bundle

Vulcan QuarryModeller Bundle

Vulcan Underground Mine Planning

Mining engineers apply a dedicated mining toolset for designing, evaluating and guiding daily underground mine operations.

Vulcan MineModeller Underground Bundle, Vulcan Surveyor Bundle

3. Corvus Axiom

Corvus Axiom software has been developed by miners for miners. This revolutionary data management software solution automates and analyses mining production systems.It connects directly with your existing fleet and plant monitoring systems, bringing multiple sources of information together for powerful results.You’ll get visibility over the data being reported and the ability to export to other business systems and software using purpose-built, Intov8-certified data access tools.By linking data to your business process, you’ll be able to make decisionsfor improvement quickly and accurately.Corvus Axiom is at the core of everything we do. It’s our host system.Our engine room. This software package manages everything that happens on a mining site. It collects vital data, stores it, processes it and visually displays it. It’s the same program that enables one of our clients to process 1.6 billion data transactions a day (about 20,000 per second).

Applications :- Intov8’s Corvus Axiom software program provides a total digital solution for the mining industry.It is the most advanced, reliable and robust software package of its kind.Corvus Axiom delivers significant time savings, boosting productivity and profitability.With Corvus, supervisors and staff can work more efficiently – with less stress.

The program features 35 integrations embracing vital areas including:

Maintenance

Administration

Statutory reporting requirements

Personnel

Management

Safety

Security,warehouse.

4. EQWin

EQWin models the things you deal with every day in environmental monitoring: sampling stations, samples, sample parameters (physical, chemical, biological measurements), standards, laboratories and more.You can set up databases for water, air, soil and other types of monitoring programs – as many databases as you need.The data model accommodates samples taken for quality assurance and quality control (QA/QC) purposes, such as duplicates, replicates, splits, blanks and spikes.EQWin automatically handles the special results that occur in environmental measurements. Significant figures are preserved and reported exactly as they were imported into the database. Results reported as less-than or greater-than are fully supported, including their proper use in calculations. Qualitative (non-numeric) results are also supported.

Applications:

A powerful, versatile data import system lets you import data from electronic lab reports and field logs quickly and accurately. Data in spreadsheets can be brought directly into EQWin import files.

EQWin Report Designer- Create reports easily, visually and interactively with the built-in EQWin Report Designer. Choose from a gallery of predefined report layouts. Sort, group and filter data. Compare data to standards and display exceedances with colors and flags. Calculate statistics for any reporting period. Add formatting, logos and more.

Graphs- trends with the integrated graphing tools. Add standards to graphs to visually show exceedances.

Maps-Visualize data on maps and site drawings with the easy-to-use mapping system. A separate GIS (geographical information system) is not required.

Office software connectivity-Send EQWin reports to Microsoft Excel with one click for advanced data analysis and integration with other data sets. Insert tables, maps and graphs into reports and presentations being prepared with Office software.

Shared documents-Share reports, graphs and maps with other EQWin users, saving time and work and leveraging expertise.

4.Earth-work on screen

Earthworks On-Screen is construction estimating software. Alternative competitor software options to Earthworks On-Screen include Concrete Contractors, STACK, and BuilderSYS.EarthWorks is the easiest to use and most affordable earthwork software for excavating contractors.Earthwork software is generally a subset of CAD software, in which case it often an add-on to a more general CAD package such as AutoCAD.[3]. In that case, earthwork software is principally used to calculate cut and fill volumes which are then used for producing material and time estimates. Most products offer additional functionality such as the ability to takeoff terrain elevation from plans (using contour lines and spot heights); produce shaded cut and fill maps; produce cross sections and visualize terrain in 3D.[4] The means by which volumes are calculated in software can differ quite considerably leading to potentially different results with the same input data. Many software products use methods based on triangulated irregular networks (TINS) and triangular prism volume algorithms, however other calculation methods are in use based on rationalizing elevations into high density grids or cross-sections.

Applications:

1. Estimate earthwork volumes more accurately

Inaccurate estimation of an earthmoving job can be the difference between winning and losing the tender. It can also mean the difference between a profitable and unprofitable job.Whether you overestimate or underestimate, mistakes can be costly.

2. Optimize earthwork planning and reporting with instant cut/fill maps

Accurate earthwork analysis and reporting is central to success in civil contracting, no matter how large or small the project. Getting the accurate data you need can be limited by access to site, surveying resources, safety restrictions or changes on site between the survey and the job starting.The Polygon measurement tool now has a dynamic cut/fill map. In just a few clicks, mark out the area you are analyzing, select the comparison (e.g., Design File, previous survey, or Reference Level), then click on the heat map icon. This will generate a map displaying each area above as cut and below as fill.

3. Easily settle disputes with a log of earthwork movement on site

In the past, it was difficult to prove how much dirt had been moved and who was responsible for it. Without a detailed log of changes in stockpile volume, having to move someone else’s dirt was all too common.By conducting frequent drone surveys, you get a visual, detailed account of whose dirt went where and when. Propeller’s timeline tool allows you to slide between survey dates from one flyover to the next or see a progression of changes in a cross-section view.

6.Reactore

Reactore is a South Africa software company that was founded in 2013, and offers a software title called Reactore. Reactore offers training via documentation, webinars, live online, and in person sessions. Reactore offers a free trial. Reactore is mining software, and includes features such as 3d modeling, data exchange, data storage, exception notification, people tracking, pit optimization reporting, and risk management. With regards to system requirements, Reactore is available as SaaS, Windows, and Android software. Reactore includes online support, and 24/7 live support. Some alternative products to Reactore include Mineograph, Oil & Gas Mobile and Offline Inspection Software, and MSHA Incident Reporting.Reactore mining software is a highly equipped and sophisticated software that provides next-level smart solutions to mining firms. It has a third party system integration making it highly adaptable to the diverse needs of its users. To top it, it has an incredibly engineered GIS 3D dashboard that enables perfect and precise management. It is an advantageous solution to nearly all kinds of mining management problems.

Applications:

3D Modeling

Cross Section Creation

Data Exchange

Data Storage

Exception Notification

Fence Diagrams

People Tracking

Pit Optimisation Reporting

Risk Management

7.Igantt

Our underground and open pit production scheduling software visualize and simplify your activity-based scheduling.Our underground and open pit production scheduling software is easy to learn. Easy to use, even for first-time planners. And with Gantt charts, 3D visualization and reports that are easy on the eye, it’s easy to understand.Designed for mining businesses, it is an on-premise solution that helps auto-generate precedence of work orders and share job costing with stakeholders to streamline procurement.

Applications :

iGantt Open Pit enables you to quickly and easily:

-Create detailed, activity-based mine schedules, including trucking

-Model drill, blast, load/haul and backfill activities

-Allocate mining blocks to shovels using simple point-and-click controls

-Verify the practicality and value of schedules with 3D animation

-Generate custom reports for physicals, equipment, consumables and budget financials

-Provide management with schedule costing and streamline procurement

iGantt Underground allows you to quickly and easily:

-Generate precedences automatically based on development design strings geometry

-Save the set-up time normally associated with manually entering precedences

-Use auto-scheduling functionality to balance out resource utilization

-Optimize both development and production activities with our UG Optimizer Edition

Handles the complexities of mine optimization, planning and scheduling for both open pit and underground operations.This mining industry software provides solutions for Windows and Web App. This underground and open pit production scheduling software helps in simplifying activity-based scheduling. This software provides pit optimization reporting and 3D modeling.