Data Engineer ~~Database Administrator~~ - DRAFT

Exhibit- F

Class Code	FLSA Status	EEO-CAT	Rep Status	Salary Grade	Effective Date	Resolution #e
012	Exempt	EEO1-Professionals	AFSCME	10	12/11/2024	24-XXX

DEFINITION: Under general direction, performs moderate to complex duties in the development, installation and administration of enterprise database platforms; Implements databases, data warehouses, big data streams, data lake, data mart, and application programming interface data integration; architects, builds and tests enterprise data warehouse, data ingestion, and data models including statistical methodologies to enable machine learning and artificial intelligence with training, scoring and predictive analytics; optimizes database performance, reliability and security of enterprise platforms for structured and unstructured data; conducts upgrades, migrations, programming, quality assurance, backup recovery, proactive monitoring, troubleshooting, and automation adhering best practices while serving as subject matter experts in database technologies. ~~Under general direction, performs routine to complex duties in the development, installation, integration, administration, maintenance and support of eeEnterprise aApplication dDdatabases, dData wWarehouse, bBig dData streams, dData lLake, dData mMart, database environmentsdata integration application programming interfaces (API)s and business software applications; architects, builds and tests eEnterprise dData wWarehouse, data ingestion and data models including statistical methodologies to enable mMachine lLearning and aArtificial Iintelligence with training, scoring and predictive analytics ; optimizes database performance, reliability and security of enterprise data platform end-to-end for both structured and unstructured data; participates in the installation of database software patches, upgrades and, conversionsmigrations, system programming, quality assurance, backups, recovery, proactive monitoring and automation adhering industry's best practices; performs troubleshooting and resolution of complex database performance problems and issues. Incumbents in this classification serve as a technical leader and subject matter expert in database management providing recommendations, support, and training to District personnel in the area(s) of expertise.~~

~~Under general supervision,designs, configures, installs, and maintains District-wide databases; performs data analytics and reporting; troubleshoots and develops methods and solutions to optimize system performance and scalability; develops backup and disaster recovery processes to ensure availability of databases and business related applications, and develops and implements strategy for database security and on-going maintenance and support, and data analytics and reporting. withe Data Systems Administrator maintains and modifies a database; analyzes system performance; designs and writes queries and programs; designs, documents and implements all system and server processes including security, access, test routines, and back up; modifies existing programs to user requirements; troubleshoots and resolves malfunctions; writes systems documentation; and may provide work direction to journey and lower level programmers.~~

REPRESENTATIVE FUNCTIONS may include, but are not limited to the following:

- Implements and analyzes database and warehousing architecture, processes, and usage, typically in SQL Server; and identifies and corrects database design and programming issues; establishes and monitors standards for the management of District databases; serves as a technical expert consulting with vendors, and District staff on database-related concerns including software patches, upgrades, and migrations.
- Engineers, enhances, integrates, and administers various enterprise application databases, data warehouses, big data streams, data ~~lake~~lakes, data mart, application programming interface integrations, continuous integration/continuous delivery (CI/CD), and operations (DevOps) pipelines; architects, builds and tests enterprise data warehouse, data ingestion and data models including statistical methodologies to enable machine learning and artificial intelligence with training, scoring, and predictive analytics.
- Develops algorithms, routines, scripts, and data queries for programming interfaces among disparate sources; design data extracts, data normalization processes, and related automation for District-wide analysis; translate business requirements into technical ~~solution~~solutions for business intelligence, machine learning, artificial intelligence, and data science harnessing statistics, software components, data models, simulation, descriptive and predictive analytics to identify trends, patterns.
- Uses a variety of analytics and tools for enterprise data reporting; creates, migrates, and enhances analytics

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and reporting platforms such as for cross-business systems and processes; sources,, interprets, and cleanses data banks to enrich data mining with the implementation of new mathematical methods and models to surface constructive patterns for data science exploration.

- Ensures the availability and integrity of enterprise database solutions and business applications to deliver high-level, business continuity; optimizes performance, reliability, and security of enterprise data platforms end-to-end for both structured and unstructured data; augments data warehouse, data lake, and big data streams; utilizes advanced database constructs including dynamic table partitions, indexed or materialized views, declarative or common language runtime objects, memory-based tables and geographic, spatial, hierarchical data models, and schema design.

- Safeguards database security, health, availability, regulatory compliance, capacity planning, coding standards, quality controls, backup recovery, access privileges, and overall database system long and short-term requirements in collaboration with management adhering to industry best practices.

- Attends and participates in professional group meetings; stays abreast of new trends and technologies; researches emerging innovations for their applicability to the District.

- Performs related duties as required.

- Develops, installs, administers, and maintainssoftware , web applications,, analyzes,and resolves , business application,. a variety ofvarious enterprise data storage, systemseEnterprise aApplication dDatabases, Ddata wWarehouses, Bbig Ddata streams, dData lLake, dData mMart, data integrations APIs servers, and business software applications; architects, builds and tests Eenterprise dData wWarehouse, data ingestion and data models including statistical methodologies to enable mMachine lLearning and aArtificial iIntelligence with training, scoring and predictive analytics.

- Eensures the the availability, and integrity, and security of enterprise databusiness applications and enterprise data to deliver high- level, of 24x7 bBusiness cContinuity and databases.; optimizes database performance, reliability, and security of enterprise data platform end-to-end for both structured and unstructured data.

- Designs, configures, and optimizes District-wide databases; analyzes database architecture and monitors disk-usage to maintain integrity of database(s) and/or servers; reconfigures or relocatesOptimizesAugments databaseDdata wWarehouse, dData lLake and bBig dData stream's data for optimal performance and reliability utilizing ; writes code to migrate data; partitions tables and conducts data auditing.advanced constructs including dynamic table partitions, indexed or materialized views, proceduraldeclarative or common language runtime objects, memory-based tables and geographic, spatial, hierarchical data models, and schema design.

- Creates and maintains a cContinuous iIntegration/Ccontinuous dDelivery (CI/CD) IT dDevelopment and oOperations (DevOps) pipeline; sSupports cConfigurations mManagement of business applications, data integration APIs and related solutions; Aadministers, documents and implements dData gGovernance and sSystems sSecurity.

- Assists in developing and implementing database security and recovery policies and procedures; identifies database design and/or programming issues impacting integrity or security of data and recommends and implements corrective action for resolution; assigns and monitors appropriate access privileges to end-users.

- Monitors District database storage and warehousing systems and processes; collaborates with management to identify future storage requirements; participates in developing and provides recommendations for long- and short-range database system plans.

- Serves as technical lead for assigned data-centric projects, working with vendors, contractors, project managers, and other District staff, installing, configuring, testing, and providing technical support and expertise for database software patches, upgrades, and conversions; develops technical and end-user documentation.

- Participates in upgrades, migrations, system programming, quality assurance, backups recovery, proactive monitoring, and automation adhering industry's best practices;

- Performs troubleshooting and resolution of complex database performance problems and design flaws; provides technical expertise during major database and system software incidents to ensure an expedient response and resolution.

- Develops algorithms, routines, scripts, and SQLdata queries for programming interfaces between multiple data sources and end-user query tools; develops data extracts, data normalization processes, and merge routines

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for business process analysis and decision-making.

- Uses a variety of analytics and tools for enterprise data reporting; creates, migrates, and enhances SQL Server Reporting Services reports (SSRS)analytics and reporting platform; creates supplementary reports for web-based applications cross- business systems and business processes; identifies optimal report output format; writes programs to reconcile, audit data and perform consistency checks;.
- Translate business requirements to technical solution in collaboration of business stakeholders for bBusiness iIntelligence, aArtificial iIntelligence, and aAnalytics supports.
- Sources, interprets, and cleanses data banks to enrich data mining with the implementation of new mathematical methods and models to surface constructive patterns for data science exploration.extracts, transforms and loads (ETL) data/packages.

- Provides technical support in developing new databases in response to business re-engineering processes; creates, modifies or troubleshoots database programming; creates objects, tables and other database elements.
- Uses a variety of analytics tools for enterprise data reporting; creates, migrates and enhances SQL Server Reporting Services reports (SSRS); creates reports for web-based applications; identifies optimal report output format, such as Excel; writes programs to reconcile data and perform consistency checks; extracts, transforms and loads (ETL) data/packages.
- Performs periodic and ongoing server & application monitoring and maintenance; performs a variety of tasks involving database backups, recovery, and safeguards; administers server maintenance plans for database backups; programs and manages differential and log backups; as needed, implements database recovery protocols; checks and diagnoses key data processes, and creates and tests scripts used to build, restore, remove, and/or maintain databases.
- Develops algorithms, routines, scripts, and SQL queries for programming interfaces between multiple data sources; develop data extracts, data normalization processes, and merge routines District-critical reports.

- Allocates, formats, and customizes, tests, and installs vendor software releases to meet District requirements; oversees vendorduring system testing and implementation
- Collects, aggregates, and analyzes data from multiple internal and external sources to drive insights into optimal business performance for the District.
- Applies working expertise of statistics, programming, data ingestion, data modeling, simulation, deep learning to identify patterns, opportunities, to inform business decision-making.

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- Provides technical support in developing new databases in response to business re-engineering processes; creates, modifies or troubleshoots database programming; creates objects, tables and other database elements.
- Performs software, web application and SharePoint administration and maintenance support tasks; modifies active server pages (ASP) and HTML programming; converts web-based reporting to SQL reporting system formats; administers the SharePoint Online system; creates SharePoint work-flows, web pages and sub-sites based upon user needs; maintains the public website; implements security and permissions configurations.
- Attends and participates in professional group meetings; stays abreast of new trends, technologies, and innovations in the area(s) of assignment; researches emerging technology and enhancements and their applicability to departmental and District needs.
- Performs related duties as required.

Designs, documents and implements security, back up and recovery of assigned database(s) and indexes, runs performance queries, and schedules systems maintenance.

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- Administers systems security, and assigns appropriate access privileges to end-users.
- Writes and/or modifies software programs using database languages.
- Writes and tests scripts used to build, restore, dump, and/or maintain databases.
- Uses system commands and protocols to maintain network systems and/or databases.
- Designs and implements testing routines to identify and resolve (de-bug) conflicts and potential operating malfunctions.
- Analyzes database architecture and monitors disk-usage to maintain integrity of database(s) and/or servers, and reconfigures or relocates data for optimal performance.
- Design application programs to minimize run time and response times.
- Documents procedures, and provides user information and training materials.
- Troubleshoots and resolves malfunctions with databases, servers, operating platform/database interfaces, and networked systems.
- Confers with end-users to identify user needs, and with vendors regarding programming and/or systems upgrades. Estimates time and resources needed for projects, develops project schedules, and may help end users prepare service request forms.
- Performs related duties as required.

MINIMUM QUALIFICATIONS

Knowledge of: Principles and practices of database management and architecture including data modeling, storage, partitioning, indexing, security, data auditing, and archiving; industry best practices in the management and control of technology systems; operating systems and programming languages applicable to assigned system(s); principles, methodology and applications of relational database theory; methods and techniques of troubleshooting database and application issues; methods and techniques of setting up, configuring and optimizing databases; tools and utilities used in database development and administration; operational characteristics of database hardware and software; database system security methods; methods and techniques of maintaining servers; database recovery techniques; methods and techniques of documenting technical procedures; techniques for providing a high level of customer service by effectively working with District staff; mathematic principles; business English usageand technical writing; modern office methods and procedures.

Principles and practices of software applications in a client-server, Microsoft NT, Novell and/or HP3000 mainframe environments; operating systems and programming languages; applicable to position responsibility (current examples) SQL, SQR, Cobol, PeopleCode, Image, and MPE; principles, methodology and applications of relational database theory;

Ability to: Provide technical support to the Districts database operations; monitor and backup databases; develop and administer database system security; write and modify software programs; program and prepare a variety of system reports; maintain, troubleshoot, and resolve malfunctions with databases and associated applications; write documentation and user information and training materials; design and implement testing routines; set-up and install software and upgrades, keep abreast of current and imminent developments in the field of database development and administration; establish and maintain effective working relations with District personnel by demonstrating excellent customer service skills; communicate effectively both orally and in writing. Applies working expertise of statistics, programming, data ingestion, data modeling, simulation, deep learning to identify patterns, opportunities, to inform business decision-making.

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~~set-up and troubleshooting procedures; database recovery techniques; data dictionary tables and tools; project management; documentation procedures; systems design, configuration, testing and troubleshooting; basic mathematics and algebra; business English usage; and modern office methods and procedures. Ability To: Back up databases; develop and administer system security; write and modify software programs; maintain, troubleshoot, and resolve malfunctions with databases, networked systems and/or PCs; write documentation and user information and training materials; review and analyze user requirements; research and make recommendations regarding implementation of new programs and/or technologies including time and cost estimates; design and implement testing routines; set-up and install software and upgrades, keep abreast of current and imminent developments in computer technology; establish and maintain effective working relations with District personnel using principles of good customer service; and communicate effectively both orally and in writing.~~

Education: Equivalent to a ~~b~~Bach~~ell~~elor's degree in ~~c~~Computer ~~s~~Science, ~~m~~Mathematics, or a closely related field~~,~~ ~~or certification of completion of a recognized program in Computer Science.~~.

Experience: ~~FiveFiveSevenTwoSeven~~ Five (5) ~~(75572)~~ years of ~~full-time~~ progressively responsible experience in ~~a~~ database technology, including development, administration, architecture, ~~and~~or data warehousing. ~~management, data processing related field in a client-server environment,and/or enterprise business applications support. Demonstrable proficiency of data centric technologies to generate complex query for given business problem. Expertise in bussiness intelligence, data anlytics, analysis service, object oriented programming, system analysis. Professional experience in prodcution support of 24x7 mission cirtiical enterprise systems and on-call rotations. one (1) year of which must include performing a variety of tasks in support of administering a database~~

~~. Additional education may be substituted for up to one year of the general experience on a year for year basis.~~

License and Certification(s): None. ~~Possession of, or ability to obtain a valid Class C California Driver License.~~

Physical Requirements: ~~:~~ (1) Must maintain the physical condition necessary to perform tasks in an office setting operating a personal computer, keyboards, and other peripheral equipment. (2) Must possess the mobility necessary to transport oneself to other locations within the District, as required by the position.

Special Environmental Conditions: None.

Special Requirements: Must be willing to: (1) work outside regular business hours as required and (2) travel between the various District locations.

Established Date: 09/23/1999 (Res. No. 1104)

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