DEAP
Competencies: Computing Skills

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Introduction

As part of our initiative to determine competencies important to computing professionals, we interviewed 32 individuals in computing related roles who work in a range of industries and have varied roles, responsibilities, and professional and educational backgrounds. We also reviewed 52 articles that included data from computing professionals related to skills, knowledge, and/or dispositions required on the job (with publication dates from 2010-2021). This document is the first draft report of the findings related to Computing Skills from across data sources.

These data sources were analyzed using a thematic analysis. After the initial data analysis, the list of computing skills was reviewed by Dr. Susan Vrbsky, with assistance from other members of the DEAP pilot local team.
Architecture
   Design Architecture / System Architecture
   Information Technology Architecture
   Reviewing Architecture UI Architecture

Cloud Computing Deployment
   Build Considerations
   Cloud - Documentation
   Cloud Based Automation
   Cloud Native
   Cloud Service Support
   Container
   Management of Cloud Based Services
   Managing VM Build and Destruct Cycles
   Migrating to Cloud
   Query Data on Cloud
   Store to Cloud
   Virtualization

Computer Communication Networks
   Managing Drive Failures
   Network Analysis
   Network Infrastructure
   Network Typologies and Services
      Local Area Network (LAN)
      Storage Area network (SAN)
      Wide Area network (WAN)
Networking Protocols
Packet Level Analysis
Switching
Traffic Management

Data Processing
Big Data
Big Data (General)
Efficiency Optimization
Scaling Up for Big Data
Minimizing Operations Load
Refactoring Code
Runtime Reduction
SQL Index Modification
Data Analysis
Data Analytics
Data Architecture
Data Management
Data Mining & Warehousing
Data Science Engineering
Data Visualization
Extract Transform Load (ETL)

Database Skills
Audit Reviews
Database Design
Database Management
Database Migration
Database Programming
Database Querying
Database Recovery
Database Skills (General)
Database Types
NoSQL Database
SQL Based Serverless Environment
SQL Database/Relational
Transactional Databases
Information Management
Reporting

Design
Designing High-level Systems
Infrastructure Design
Interface Design

IT Support
Types of Support Functions
Customer Support
Desktop Support
Field Support
Operations Support
Technical Support
Machine Learning

Modeling
  - Business Modeling
  - Data Modeling
  - UML

Operating Systems Skills

Requirements Engineering
  - Requirements Analysis and Translation
  - Requirements Elicitation
  - Requirements Prioritization
  - Requirements Scope Creep
  - Requirements Specifications Writing
  - Requirements Validating

Review and Recovery Logs
  - Recovery Logs
  - Review Logs

Security and Security Policies
  - General - Security and Policies
  - Information Assurance
  - Intrusion Detection and Response
    - Incident Response
    - Intrusion Detection
  - Network Access Management
  - Network Security - Firewalls
  - Recovery and Remediation
  - Social Engineering
  - Threats and Vulnerabilities
Network Defense Policies and Regulations

Preventive Test Measures
  - Conduct Security Audits / Reviews
  - Designing and Running Phishing Tests
  - Penetration Testing

Running Center for Internet Security Reports

Security Measures
  - Blockchain
  - Cyber Engineering
  - Cybersecurity
  - Encryption and Decryption
  - Security Sensors
  - Signature Security

Software Configuration Management
  - SCM Process Management
  - SCM Tools

Software Development
  - Automation
  - Backup Software
  - Code/ Design review
  - Debugging
  - Dev Stack Ops

Development Categories
  - Building APIs and Orchestration
  - Compiler Development
  - Database Development
  - Full Stack Development
  - Library Development
  - Mobile App Development
  - Platform Development
  - Process Flow Development and Optimization
SaaS
Web Application Development
Human-Computer Interaction
Programming Skills
Ability to Switch to Another Language as Needed
Appropriate use of Algorithms
Appropriate Use of APIs and Frameworks
Appropriate use of Libraries
Commenting Code
Knowing More than One Programming Languages
Maintainability
Object Oriented Application
Pair Programming
Performance Optimization
Reading Code
Refactoring
Reusability / Structuring
Scalability
Scripting
Test Driven Development
Using Style Conventions
Working with Inherited Code
Write Self-documenting Code

Software Development Lifecycle

Software Engineering

DevOps
Process Models and Methodologies
Agile
Extreme Programming
General Process Models
Incremental Development Model
Iterative Development Model
Rapid Prototyping
Waterfall Model
Reverse Engineering
Service Delivery
Software Engineering Economics
Software Engineering Management
Software Release Management
Software Reliability and Fault Tolerance
Software/Systems Analysis
Software/Systems Architecture
Software/Systems Design
Standards / Regulations

Software Maintenance
Maintaining Code
  Case Analysis of Code
  Fixing Broken Code
  Maintain (General)
  Monitoring Code Functioning
Maintaining Software

Software Project Management

Software Quality Assurance

Software Testing
  Architecting Test Tools
  Bug Management Systems
  Bug Reports Writing
  Choosing Testing Methodology
  Developing Test Cases
  Test Mapping
  Test Plan Development
  Testing Documentation
  Testing Solution
  Testing Types
    Blackbox Testing
    Blended Testing
    Developer Testing
    Exploratory Testing
    Manual Testing
    Monkey Testing/Random Testing
    Performance Regression Testing
    Script-less Test Automation
    System Testing
    Testing Automation
    Unit Testing
Writing Tests

System Administration

Tinkering

Troubleshooting

Usability Engineering

UX/UI
  Creating Design Mock Ups
  State Management
  UI / UX Design
  UX Review
  Visual Design
  Wireframe

Version Control

Web and Internet