Teacher: Steve Sabaugh

Unit Plan: UNIX and 'UNIX-like' Operating Systems

Grade and Content: AP Computer Science Principles

Date: Days 9 & 10

Lesson: Intro to AWK and Computer Modeling

Overall Goal/Objective of Lesson (one sentence)**:** A lesson that introduces students to the AWK programming language and how to create a predictive statistical model using linear regression

Content Objectives (nouns) -Students will understand what AWK is and its similarities to bc, C, Java and Python -Students will understand how linear regression is used to make predictive computer models -Students will understand what an associative array is -Students will see how AWK is a powerful tool for Data Analytics and File Handling	**Assessments**
Skill/Language Objectives (verbs/Common Core Standards) - Students will be able to program AWK from the UNIX command line and Text file - Students will be able to calculate Linear Regression - 9-12.CT.1 Create a simple digital model that makes predictions of outcomes.	**Assessments** Summative- A predictive population model using AWK see AWK_Final_Assessment.pdf

Materials

AWK slide deck

Code along notes:

unit_plan-stevesolo/resources/AWK/AWK_regression_model_lesson.md

Code along resources:

unit_plan-stevesolo/resources/unix-src/TedCmdLines.txt

unit_plan-stevesolo/resources/unix-src/TedWarYears.txt

unit_plan-stevesolo/resources/unix-src/ted.txt

Assessment resources:
unit_plan-stevesolo/assessments/AWK_Final_Assessment.md
Unit_plan-stevesolo/assessments/DataSets/BKLNpop.txt
unit_plan-stevesolo/assessments/DataSets/NYCpop.txt
unit_plan-stevesolo/assessments/DataSets/NYSpop.txt

Teacher's Laptop and projector

Student computers with a UNIX/Linux environment
Student’s Resource folder
Journal
Pen/Pencil
usb stick

Sequence of Lesson Plan

Time Allotment	**Mini-Lesson/Direct Instruction (with Modeling)** *What information is essential for the student to know before beginning and will this skill be communicated? How will you be demonstrating this skill? Identify strategies to be used to determine if students have learned the objectives. The teacher models the process to be followed and makes connections to previous instruction. The teacher checks for student understanding. The teacher's explanation should be clear. Questions and tasks are higher order and have multiple possible answers.*	**Plans for Differentiation/ Culturally Responsive Instruction**
10 minutes 30 minutes	1. **<u>Mini-Lesson:</u>** What makes AWK such a powerful tool? How do we make a computer model? How is AWK similar/different to Python? 2. **<u>Modeling:</u>** Model how to use the AWK language to manipulate a data set. I will demo the language using stats of a baseball player. Students can code-along or just watch the demo. I will use the think-aloud method to show my problem solving process. I will continue to model by creating a predictive model of Ted William's batting averages if he did not leave to Yight in WWII. As I am modeling this language, I will remind students of the similarities to what we have covered during our unit so students know what we can look for when comparing to other languages. As I am demonstrating, I will also be teaching the history and math behind the lesson. see AWK_regression_model_lesson.pdf	-Mini-Lesson notes are completed in guided notes format, therefore being easier to copy and comprehend -Terminal commands are printed ahead of times so students can follow along easier -Material is presented in clear and easy-to-follow format -Modeling is done so students can see how to use this strategy -Harder concepts are shown clearly in slides

Day 10 only 45 minutes	**Independent Practice (with Teacher Monitoring)** *Assignments to be given to students to ensure they have mastered the skill without the teacher's guidance. Students have a choice in how they complete tasks. Students may modify or make additions to the task based on their needs.* 1. **<u>Independent Assessment:</u>** Students will work (Driver/Navigator) in heterogeneous groups (elbow mates) on population model. see AWK_Final_Assessment.pdf	**Plans for Differentiation/ Culturally Responsive Instruction** -Groups are differentiated because students are working with partners based on coding level. -Groups are small so students can collaborate effectively -Assignment is differentiated based on level. Advanced questions. -Students work from my exemplar from previous lesson
Day 9 only 5 minutes	**Closure** *What method of review/assessment will be used to complete the lesson? Students will have an opportunity for reflection, sense-making, and closure. Teacher cites multiple approaches for those students who experience difficulties. The teacher conveys that the lesson is not "done" until all students understand or can demonstrate the skill.* 1. **<u>Share-Out:</u>** Teacher will ask students to review concepts they have learned in their own words and explain the assessment for tomorrow's lesson	**Plans for Differentiation/ Culturally Responsive Instruction** -Closure allows students to communicate with each other as well as hear definitions in student's own words