Concept Guide: Repetition Structures – code reusability

Course: CS 200

Introduction to Java Programming, Comprehensive Version, 11th ed. Text

Chapter: 5 Loops

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| Concept/Topic: | Text Notes: | Lecture Notes: |
| Review of  Programming structures:  Programming Rule # 01,  Decision Structures |  |  |
| Repetition  Structures  (AKA Loops) |  |  |
| Key Components to a Repetition  Structure: overview |  |  |
| starting  value |  |  |
| conditional statement |  |  |
| body of the loop |  |  |
| MOE:  **M**ethod  **O**f  **E**gress |  |  |
| infinite loop |  |  |
| pre-test  loop |  |  |
| Best Choice  Loop Syntax  when number  of iterations is known |  |  |
| post-test  loop |  |  |
| Best Choice  Loop Syntax  when body of loop must be executed **at least once**. |  |  |
| Increment &  Decrement  Operators |  | (see sample source code) |
| Operator Precedence:  Increment &  Decrement  Operators |  |  |
| Sentinel Values |  |  |
| Syntax:  for  loop |  | for (int i=0; i<10; i++)  //starting value, test/conditional statement, MOE  {  //body of the loop  } |
| Lab Time! |  | Use a repetition structure  to display to the screen, only the odd values from 1-25 inclusive.  **Flowchart,**  then code using a “for loop.” |
| Syntax:  while  loop |  | int x=0; //starting value  while (x<10) //test/conditional statement  {  //body of loop  x++; //MOE  } |
| Best Choice  Loop Syntax  when loop stops on a sentinel value or number of iterations cannot be pre-determined |  |  |
| Lab Time! | Use this data as input:  1,2,4,-17 | Use a repetition structure  to sum all the positive integers entered by the user, until a negative integer value is entered. Display the sum & mean (average) of the positive integer list to the screen.  **Flowchart,**  then code using a  “while loop.”  Hint: do not add the negative value to your sum or average. |
| Syntax:  do-while  loop |  | int x=0; //starting value  do  {  //body of loop  x++; //MOE  } while (x<10) **;** //test/conditional statement |
| Lab Time! | Use this data as input for 4 runs  a B c D !  A A A ?  b I r d 3  &  (Note: only enter 1 char at a time) | Use a repetition structure  Asking the user for a single character input and then display if it is upper case, lower case, or non-alpha. If it is non-alpha the loop should terminate.  **Flowchart,**  then code using a  “do-while loop.” |
| nested loops |  |  |
| Lab Time! |  | Use nested repetition structures  to display a multiplication table from 1 -12 inclusive.  Flowchart,  then code using 2 “for loops”  Hint: outer loop is for rows, inner loop is for columns, and use printf. |
| Lazy programming techniques with loops |  | NOT ALLOWED IN CS 200 – with loops:  break  continue |
| continue; |  |  |
| break; |  |  |