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| #1 Write a program in "JAVA" or "C" to develop a simple calculator that would be able to a number, an operator (addition/subtraction/multiplication/ division/modulo) and another number consecutively as input and the program will display the output after pressing "=" sign. Sample input: 1+2; 8%4; Sample output: 1+2=3; 8%4=0.  #include <stdio.h>  int main() {  int num1, num2, result;  char op;  printf("Simple Calculator (Type 'q' to quit)\n");  while (1) {  printf("\nEnter expression (e.g., 1+2): ");  if (scanf("%d %c %d", &num1, &op, &num2) != 3)  {  char ch;  scanf("%c", &ch); // get the non-numeric input  if (ch == 'q' || ch == 'Q') {  printf("Exiting calculator.\n");  break;  } else {  printf("Invalid input. Try again.\n");  // flush the input buffer  while ((ch = getchar()) != '\n' && ch != EOF);  continue;  }  }  if ((op == '/' || op == '%') && num2 == 0) {  printf("Error: Division or modulo by zero is not allowed.\n");  continue;  }  switch (op) {  case '+': result = num1 + num2; break;  case '-': result = num1 - num2; break;  case '\*': result = num1 \* num2; break;  case '/': result = num1 / num2; break;  case '%': result = num1 % num2; break;  default:  printf("Invalid operator. Use +, -, \*, /, %%.\n");  continue;  }  printf("%d%c%d=%d\n", num1, op, num2, result);  }  return 0;  } |

2. Write a program in “JAVA” or “C” that will take two ‘n’ integers as input until a particular operator and produce ‘n’ output. Sample input: 4 5 7 8 20 40 +; Sample output: 9 15 60.

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| #include <stdio.h>  int main() {  int n, i;  char c, op;  while (1) {  printf("Enter n (or 'q' to quit): ");  if (scanf("%d", &n) != 1) {  scanf(" %c", &c);  if (c == 'q' || c == 'Q') {  printf("Calculator exited.\n");  break;  } else {  printf("Invalid input. Try again.\n");  while ((c = getchar()) != '\n' && c != EOF); // clear buffer  continue;  }  }  if (n <= 1 || n % 2 != 0) {  printf("Enter an even number greater than 1.\n");  while ((c = getchar()) != '\n' && c != EOF);  continue;  }  int arr[n];  printf("Enter %d numbers: ", n);  for (i = 0; i < n; i++) {  scanf("%d", &arr[i]);  }  printf("Enter operator (+, -, \*, /, %%): ");  scanf(" %c", &op);  printf("Output: ");  for (i = 0; i < n; i += 2) {  int a = arr[i];  int b = arr[i+1];  switch (op) {  case '+': printf("%d+%d=%d ", a, b, a + b); break;  case '-': printf("%d-%d=%d ", a, b, a - b); break;  case '\*': printf("%d\*%d=%d ", a, b, a \* b); break;  case '/':  if (b == 0) printf("%d/%d=Err ", a, b);  else printf("%d/%d=%d ", a, b, a / b);  break;  case '%':  if (b == 0) printf("%d%%%d=Err ", a, b);  else printf("%d%%%d=%d ", a, b, a % b);  break;  default:  printf("\nInvalid operator.\n");  i = n; // stop loop  }  }  printf("\n");  while ((c = getchar()) != '\n' && c != EOF); // clear buffer  }  return 0;  } |

#3. Write a program in “JAVA” or “C” to check whether a number or string is palindrome or not. N.B: Your program must not take any test case number such as 1 or 2 for the desired cases from the user. Program user will insert a number or string as input directly and the program will display the exact result in the output console.

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| #include <stdio.h>  #include <string.h>  #include <ctype.h>  int main() {  char input[1000];  int len, i, isPalindrome;  while (1) {  printf("Enter a number or string (or 'q' to quit): ");  fgets(input, sizeof(input), stdin);  // Remove newline  len = strlen(input);  if (input[len - 1] == '\n') {  input[--len] = '\0';  }  // Quit if input is 'q' or 'Q'  if (len == 1 && (input[0] == 'q' || input[0] == 'Q')) {  printf("Exiting program.\n");  break;  }  isPalindrome = 1;  for (i = 0; i < len / 2; i++) {  if (tolower(input[i]) != tolower(input[len - 1 - i])) {  isPalindrome = 0;  break;  }  }  if (isPalindrome)  printf("%s is a palindrome.\n\n", input);  else  printf("%s is not a palindrome.\n\n", input);  }  return 0;  } |

#5Write a program in “JAVA” or “C” to find out the factorial of a number using while or for loop. Also verify the results obtained from each case

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| #include <stdio.h>  #include <string.h>  int main() {  char choice[10];  int num, i;  unsigned long long fact;  while (1) {  printf("Type 'for' to use for loop, 'while' to use while loop, or 'q' to quit: ");  scanf("%s", choice);  // Quit if user enters q  if (strcmp(choice, "q") == 0 || strcmp(choice, "Q") == 0) {  printf("Exiting program.\n");  break;  }  // Take number input  printf("Enter a positive integer: ");  scanf("%d", &num);  if (num < 0) {  printf("Factorial is not defined for negative numbers.\n\n");  continue;  }  fact = 1;  printf("%d! = ", num);  if (strcmp(choice, "for") == 0) {  for (i = 1; i <= num; i++) {  fact \*= i;  printf("%d", i);  if (i != num)  printf(" x ");  }  printf(" = %llu\n\n", fact);  }  else if (strcmp(choice, "while") == 0) {  i = 1;  while (i <= num) {  fact \*= i;  printf("%d", i);  if (i != num)  printf(" x ");  i++;  }  printf(" = %llu\n\n", fact);  }  else {  printf("Invalid choice. Please type 'for', 'while', or 'q'.\n\n");  }  }  return 0;  } |

#6 Write a program in “JAVA” or “C” that will find sum and average of array using do while loop and user-defined function.

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| #include <stdio.h>  #include <stdlib.h>  int main() {  char ch;    while (1) {  int n, i, sum = 0;  float average;  int arr[100];  printf("Enter array size (or 'q' to quit): ");    if (scanf("%d", &n) != 1) {  scanf(" %c", &ch);  if (ch == 'q' || ch == 'Q') {  printf("Calculator exited.\n");  break;  } else {  printf("Invalid input. Try again.\n");  while ((ch = getchar()) != '\n' && ch != EOF); // flush buffer  continue;  }  }  if (n <= 0 || n > 100) {  printf("Invalid array size.\n");  continue;  }  printf("Enter %d array elements: ", n);  for (i = 0; i < n; i++) {  scanf("%d", &arr[i]);  sum += arr[i];  }  average = (float)sum / n;  printf("Sum : %d\n", sum);  printf("Average : %.2f\n\n", average);  while ((ch = getchar()) != '\n' && ch != EOF); // clear input buffer  }  return 0;  } |

#7. Write a simple “JAVA” program to explain classNotFound Exception and endOfFile (EOF) exception.

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| import java.io.\*;  public class ExceptionDemo {      public static void main(String[] args) {          // Demonstrating ClassNotFoundException          try {              Class.forName("NonExistentClass");          } catch (ClassNotFoundException e) {              System.out.println("ClassNotFoundException caught:");              System.out.println(e.getMessage());          }          // Demonstrating EOFException          try {              // Create a file and write some data              FileOutputStream fos = new FileOutputStream("data.txt");              ObjectOutputStream oos = new ObjectOutputStream(fos);              oos.writeInt(100);              oos.close();              // Now try to read more data than available              FileInputStream fis = new FileInputStream("data.txt");              ObjectInputStream ois = new ObjectInputStream(fis);              System.out.println("Read Integer: " + ois.readInt());              // Trying to read again causes EOFException              System.out.println("Read again (will cause EOFException):");              System.out.println(ois.readInt()); // Nothing more to read              ois.close();          } catch (EOFException e) {              System.out.println("EOFException caught: End of file reached.");          } catch (IOException e) {              System.out.println("IOException caught: " + e.getMessage());          }      }  } |

8. Write a program in “JAVA” or “C” that will read a input.txt file containing n positive integers and calculate addition, subtraction, multiplication and division in separate output.txt file. Sample input: 5 5 9 8; Sample output: Case-1: 10 0 25 1; Case-2: 17 1 72 1.

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| #include <stdio.h>  int main() {  freopen("Input.txt", "r", stdin);  freopen("Output.txt", "w", stdout);  int a, b;  while (scanf("%d %d", &a, &b) == 2) {  printf("Sum of %d and %d is %d\n", a, b, a + b);  printf("Subtraction of %d and %d is %d\n", a, b, a - b);  printf("Multiplication of %d and %d is %d\n", a, b, a \* b);  if (b != 0)  printf("Division of %d and %d is %.2f\n", a, b, (float)a / b);  else  printf("Division of %d and %d is undefined (division by zero)\n", a, b);  printf("------------------------\n");  }  return 0;  } |