**COP2270 – “C” for Engineering**

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***Problem 1 (3 Points): If the field width is larger than the data being printed, the data will normally be \_\_\_\_\_\_\_\_\_\_ within that field.***

1. ***truncated***
2. ***right justified***
3. ***centered***
4. ***left justified***

***Problem 2 (3 points) Which of the following is the correct way to output the value of 4 left justified?***

1. ***printf( "%i", 4 );***
2. ***printf( "%-i", 4 );***
3. ***printf( "4%i", 4 );***
4. ***printf( "4-%i", 4 );***

***Problem 3 (4 Points) Structures may contain variables of many different data types—in contrast to \_\_\_\_\_\_\_\_\_\_\_ that contain only elements of the same data type.***

1. ***files***
2. ***arrays***
3. ***constants***
4. ***functions***

***Problem 4: (15 Points) Write a program to do the following Task***

* ***It should prompt to enter a number up to 3 digit. The number should be called A. (take a screen shot)***
* ***Once you enter the number, it should prompt to enter another number. This number is tagged as B. (take a screen shot)***
* ***Once it is entered – the output should list the following (all in one screen Shot)***

1. ***Sum = A+B***
2. ***Dif = A – B***
3. ***Mul = A x B***
4. ***Div = A/B***

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| ***Commands*** |
| ***#include <stdio.h>***  ***#include <math.h>***  ***#include <stdlib.h>***  ***int main(void)***  ***{***  ***float division;***  ***int multiplication;***  ***int summation;***  ***int difference;***  ***int A;***  ***int B;***  ***printf("\nPlease enter first integer(A)[up to 3 integers]: ");***  ***scanf("%d", &A);***  ***printf("Please enter second integer(B)[up to 3 integers]: ");***  ***scanf("%d", &B);***  ***if (A<1000 && B<1000) {***  ***multiplication = A \* B;***  ***division = A / B;***  ***summation = A + B;***  ***difference = A - B;***  ***printf("Sum = %d\n", summation);***  ***printf("Dif = %d\n", difference);***  ***printf("Mul = %d\n", multiplication);***  ***printf("Div = %.2f\n", division);***  ***}***  ***else{***  ***printf("Error");***  ***}***  ***return 0;***  ***}*** |
| ***Input*** |
| ../Screen%20Shot%202018-04-29%20at%2010.12.00%20PM.png |

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| ***Output*** |
| ../Screen%20Shot%202018-04-29%20at%2010.06.59%20PM.png |

***Problem 5: (15 Points) Create and run an .mfile in Matlab to solve 3 equation/3 unknown***

1. ***Show the 3 equations***
2. ***Write the mfile***
3. ***Run the mfile and show the results***

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| ***Commands*** |
| ../MatLab/Equations.PNG |

***Problem 6: (20 points) Create and run an .mfile in Matlab to graph the following function***

***The m file should say equation(r,x,y,a,b)then it will display the graph as a function of r***

1. ***Solve for r***
2. ***Enter the r formula in Matlab***
   1. ***Create the function .mfile***
   2. ***Run and show the results***

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| ***Commands*** |
| ../MatLab/Circle%20Pic.PNG |

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| ***Output*** |
| ../MatLab/Circle.PNG |

***Problem 7: (25 points) Similar to Problem 5.32 on page 209 but not the same. Please change from 1 to 1023. As explained in class. The program would ask 10 questions to guess my number. After each question, the program should expect a Yes or No. Then adjust the next question accordingly. Make sure you label your questions as Question 1: Is the number greater than 512, for example. Once the 10th question is asked, then the program should present the number as “ the Number is “ Any questions, please call me at 561-271-4559***

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| ***Commands*** |
| ***#include <stdio.h>***  ***#include <stdlib.h>***  ***int main(void)***  ***{***  ***int number = 1;***  ***int highNumber = 1023;***  ***int lowNumber = 0;***  ***int i;***  ***char YN;***  ***printf("Think of a number between 1 to 1023.\n\n");***  ***for (i = 0; i < 10; i++) {***  ***number = (highNumber + lowNumber + 1) / 2;***  ***printf("Question %d: Is the number greater than %d? (Enter Y/y for yes or N/n for no): ", i + 1, number);***  ***scanf(" %c", &YN);***  ***if (YN == 'Y' || YN == 'y') {***  ***lowNumber = number;***  ***}***  ***if (YN == 'N' || YN == 'n') {***  ***highNumber = number;***  ***}***  ***printf("\n");***  ***}***  ***number = (highNumber + lowNumber + 1) / 2;***  ***printf("The number you are thinking of is %d\n", number);***  ***return 0;***  ***}*** |
| ***Input*** |
| ../Screen%20Shot%202018-04-29%20at%2010.43.30%20PM.png |

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| ***Output*** |
| ../Screen%20Shot%202018-04-29%20at%2010.34.02%20PM.png  ../Screen%20Shot%202018-04-29%20at%2010.34.30%20PM.png  ../Screen%20Shot%202018-04-29%20at%2010.40.40%20PM.png |

***Problem 8: (15 points) Write a “C” code to:***

1. ***A prompt that say “Enter the Base of the rectangle” Once entered***
2. ***Another prompt that say “Enter the Height of the rectangle. Once entered***
3. ***The output should say***

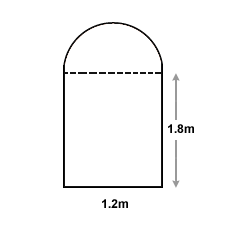
***Radius =***

***Area of the half circle =***

***Area of rectangle =***

***Total Area =***

1. ***Tabulate the answers***

[](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwjsxu_6rsrJAhUIWT4KHZw-CsYQjRwIBw&url=http://www.bbc.co.uk/bitesize/quiz/q90581037&psig=AFQjCNFyOG79knWj9R4Y7j8ivPYrr3KXDA&ust=1449598927577459)

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| ***Commands*** |
| ***#include <stdio.h>***  ***#include <stdlib.h>***  ***#include <math.h>***  ***int main(void)***  ***{***  ***float height;***  ***float base;***  ***float Carea;***  ***float Tarea;***  ***float radius;***  ***float Totarea;***  ***printf("Enter the base of the rectangle:\n");***  ***scanf("%f", &base);***  ***printf("Enter the height of the rectangle:\n");***  ***scanf("%f", &height);***  ***Tarea = height \* base;***  ***printf("\nThe area of the rectangle is %.2f", Tarea);***  ***radius = sqrt((height \* height) + (base \* base)) / 2;***  ***printf("\nRadius = %.2f", radius);***  ***Carea = (3.14 \* (radius \* radius)) / 2;***  ***printf("\nThe area of the semi circle is %.2f", Carea);***  ***Totarea = Carea + Tarea;***  ***printf("\nThe total area is %.2f", Totarea);***  ***}*** |
| ***Output*** |
| ../Screen%20Shot%202018-04-30%20at%201.15.01%20PM.png |

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| ***Output*** |
| ../Screen%20Shot%202018-04-30%20at%201.14.04%20PM.png |