Tutorial 2

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Conceptual Questions

1.What are some of the benefits of the C language? Name an example where the C language is used (hint there are many!).

2.What is a compiler, what does it do?

3.What is a makefile, what does it do?

4.Name 5 header files from the C library and explain their purpose.

5.Lookup one function from each of the header files and put down the function name and describe what it does.

Application Questions

All of your programs for this activity can be completed using the template provided, where you fill in the remaining content. A makefile is not necessary, to compile your programs use the following command in the terminal. If you do not have clang then replace clang with gcc.

clang -Wall -Wextra -std=c99 <program name>.c -o <program name>

Example:

clang -Wall -Wextra -std=c99 question1.c -o question1

You can then execute and test your program by running it with the following command.

./<program name>

1.

Create a program that does the following

-Creates an array of 10 integer values from 1 to 10

-Has a loop that iterates through the array and prints each integer in the array

#include <stdio.h>

int main(){

int A[10]={1,2,3,4,5,6,7,8,9,10};

for(int x=0;x<10;x++){

printf("%d\n",A[x]);

}

}

2.Create a program that does the following

-Creates an array of the following 5 double values 1.2, 5.5, 2.1, 3.3, 3.3

-Checks if the current value is greater than, less than, or the same as the previous value and for each case prints either "greater than", "less than", or "the same"

#include <stdio.h>

int main(){

double A[5]={1.2,5.5,2.1,3.3,3.3};

for(int x=0;x<4;x++){

if(A[x]>A[x+1]){

puts("greater then");

}

else if(A[x]<A[x+1]){

puts("less then");

}

else{

puts("the same");

}

}

}

3. Create a program that does the following

-Has a string (character array) containing the words "hello world"

-Performs an infinite loop that prints each character in the string until it reaches the end of the string (hint strings are terminated by something...)

-Your resultant output should print the string "hello world"

#include <stdlib.h>

#include <stdio.h>

int main(void)

{

char string[] = "hello world";

int i = 0;

while(1){

if (i !=sizeof(string)){

printf("%c",string[i]);

i++;

}

else{

break;

}

}

}

4.Create a program that does the following

-Loops from 1 to 10 (NOT 0 - 9)

-Checks if the number is even or odd

-Prints the number and the word "even" or "odd" based on whether the number is even or odd

#include <stdlib.h>

#include <stdio.h>

int main(void)

{

int i;

for(i=1;i<11;i++){

if ( i % 2 ){

printf("odd \n");

}

else{

printf("even \n");

}

}

}

5.A bit of math, create a program that does the following

-Has a function called euclid\_dist that takes two sets of vectors containing x and y that are integers and returns a double.

euclid\_dist(x1, y1, x2, y2)

#include <stdlib.h>

#include <stdio.h>

#include <math.h>

#include <stdlib.h>

double euclid\_dist(int x1, int y1,int x2, int y2){

return sqrt(pow(x2-x1,2)+pow(y2-y1,2));

}

int main(void){

int i;

for(i=0;i<10;i++){

int x1 = rand()%100;

int y1 = rand()%100;

int x2 = rand()%100;

int y2 = rand()%100;

double dist = euclid\_dist(x1,y1,x2,y2);

printf("x1=%d, y1=%d, x2=%d, y2=%d, distance=%f \n",x1,y1,x2,y2,dist);

}

}