Problem ST-3 (3 parts) Pointers and Structures

Assuming a 32-bit system with 32-bit memory interface and 32-bit addresses, answer the following questions.

Part A: The following variables are allocated in memory beginning at address 5000. Complete the memory map below with the variable names at each word or byte in memory. Do not include the variable's value.

```
int       A;
int       B[] = {1, 2};
char      C = 'z';
char      D[] = "Hello";
int       *E;
char      *F;
```

5000				
5004				
5008				
5012				
5016				
5020				
5024				

Part B: Suppose the following code follows the definitions in **Part A**. List the values of the listed variables following execution of this code.

```
E = B;
A = *E + E[1];
F = &(D[1]);
C = *F;
```

A _____ **C** _____ **D** _____ **E** _____ **F** _____

Part C: Consider the following structure declaration.

```
struct State {
   int        Num;
   char       Name[NAMELENGTH];
   int        YearPop[NUMYEARS];
   float      Growth;
};
```

Suppose `S` is a pointer to a previously allocated and initialized `State` object. Write proper C statements to perform the following structure accesses.

Store initial year population in integer `P`	
Store first character of `Name` in character `C`	
Set `Growth` to percentage growth between years 0 and 1. (Don't worry if it's the max.)	