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Question 1. Given `ch`, `ptr1` and `dptr` and the memory model:

Memory model

```
char    ch = '$';
char *  ptr1 = &ch;
char ** dptr = &ptr1;
```

Memory Address		Variable name
7c900	\$	ch
7c901	7c900	ptr1
7c909	7c901	dptr

State the datatypes and values in the table below.

	Datatypes	Values
<code>ptr1</code>	Pointer	7c900
<code>&ptr1</code>	Pointer	7c901
<code>*ptr1</code>	Char	\$
<code>dptr</code>	Pointer	7c901
<code>&dptr</code>	Pointer	7c909
<code>*dptr</code>	Pointer	7c900
<code>**dptr</code>	Char	\$
<code>ch</code>	Char	\$
<code>&ch</code>	Pointer	7c900

Question 2. For each of these questions, state **how much** space and **where** (Stack for main / Stack for function / Heap) is the memory allocated? Use `sizeof()` function for space.

		How much space?	Stack for main / Stack for function / Heap
a.	<pre>int main (){ int anInt; }</pre>	<code>sizeof(int)</code>	Stack for main
b.	<pre>int main (){ int anInt; anInt = fun (); } int fun (void) { int iFun = 1; return iFun * 2; }</pre>	<code>sizeof(int)</code> <code>sizeof(int)</code>	Stack for main Stack for fun
c.	<pre>int main () { char ch = 'a'; char * ptr = &ch; }</pre>	<code>sizeof(char)</code> <code>sizeof(ptr)</code>	Stack for main Stack for main
d.	<pre>int main () { char ch = 'a'; char * ptr; ptr = malloc (sizeof(char)); *ptr = ch; }</pre>	<code>sizeof(char)</code> <code>sizeof(ptr)</code> <code>sizeof(char)</code>	Stack for main Stack for main Heap
e.	<pre>int main () { char ch = 'a'; }</pre>	<code>sizeof(char)</code>	Stack for main

<pre> char * ptr; fun (ptr); } void fun (char * ptr) { ptr = malloc (sizeof(char)); *ptr = 'a'; } </pre>	<pre> sizeof(ptr) sizeof(char) </pre>	<pre> Stack for main Heap </pre>
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Question 3. What gets printed?

```

1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6
7      int *ptr, * ptr2;
8
9      ptr = malloc ( sizeof(int) * 5 );
10
11     ptr[0] = ptr [1] + 1;
12
13     ptr2 = calloc ( sizeof(int), 2 );
14
15     ptr2 [0] = ptr2 [1] + 1;
16
17     printf ( "%d \n", ptr[0]);
18     printf ( "%d \n", ptr2[0]);
19
20 }
```

Your choices are:

- a. 0
- b. 1** Line 18
- c. 2
- d. Undefined** Line 17
- e. None of the given choices

Question 4. Complete the conditional while loop that continues to prompt the user with a question “Do you wish to continue?” until the user enters a character other than ‘y’ (lower-case y). Every time the user enters ‘y’, memory for ptr is increased to accommodate an additional integer. The value assigned to this newly allocated memory is (current iteration number of the loop – 1) * 2. For example, in iteration 1, space for 1 integer is allocated and the value assigned is 0, in iteration 2, memory for ptr is increased to accommodate an additional integer and the value assigned is 2, and so on. Hint: Use malloc() and realloc()

```

int * ptr = NULL;
int i;
char ans = 'y';

```

```

i = 0;
while (ans == 'y') {

```

```

    // your code goes here

```

```

    printf ("Do you want to continue? ");
    scanf ("%c", &ans);
    getchar();

```

```

}

```

```
if(ptr == NULL) {
    ptr = malloc(sizeof(int))
    ptr[0] = (i - 1) * 2;
}
else {
    ptr = realloc(ptr, (i + 1) * sizeof(int));
    ptr[i] = (i - 1) * 2;
}

i++;
```