

Consider the following complete program:

```
1 #include <iostream>
  using namespace std;
3
4 char* add_size(const char* s) {
5     if (s==0) return 0;
6     int n = 0;
7     while (s[n] != 0)
8         ++n;
9     char* pc = new char[n+2];
10    for (int i = 0; s[i]; ++i)
11        pc[i] = s[i];
12    pc[n] = 0;
13    delete [] s;
14    return pc;
15 }
17 int main() {
18     char ch;
19     char* my_array = new char[1];
20     *my_array = 0;
21     while (cin>>ch && ch!='\n') {
22         my_array = add_size(my_array);
23         int i = 0;
24         for (; my_array[i]; ++i);
25         my_array[i] = ch;
26         my_array[i+1] = 0;
27     }
29     cout << my_array << "\n";
30     delete [] my_array;
31 }
```

1. What is the purpose of the `const` on line 4?
2. Why are `n+2` bytes allocated for `pc` on line 9?
3. Why assign `pc[n]` to 0 on line 12?
4. Describe, in detail, what the `while` loop of `main()` is doing.
5. What is the output of the `main()` if the user enters “cattdog”?