21BDS0340

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Compiler Design Lab

Assignment – VI

Question 1

Aim: To check whether a string is in the grammar a^n.b^n

Program:
```c
#include <stdio.h>
#include <string.h>

int main()
{
    char input[100];
    printf("Enter a string: ");
    scanf("%s", input);

    int num_a = 0;
    int num_b = 0;
    int i = 0;

    while (input[i] == 'a')
    {
        num_a++;
        i++;
    }

    while (input[i] == 'b')
    {
        num_b++;
        i++;
    }

    if (num_a > 0 && num_a == num_b && input[i] == '\0')
    {
        printf("String is in the form a^n.b^n\n");
    }
    else
    {
        printf("String is not in the form a^n.b^n\n");
    }
}
```

```
Enter a string: aaaaaabbbbbb
String is in the form a^n.b^n
```

Question 2

Aim: To check whether a string is in the grammar a^n.b

Program:
```c
#include <stdio.h>
#include <stdbool.h>
#include <string.h>

bool isGrammarValid(char *str)
{
    int len = strlen(str);
    int i = 0;

    while (i < len && str[i] == 'a')
    {
        i++;
    }

    if (i == len && str[i] == 'b')
    {
        return true;
    }
    else
    {
        return false;
    }
}

int main()
{
    char input[100];
    printf("Enter a string: ");
    scanf("%s", input);

    if (isGrammarValid(input))
    {
        printf("String follows the grammar a^n.b\n");
    }
    else
    {
        printf("String does not follow the grammar a^n.b\n");
    }
}
```

Output:

```
Enter a string: aaabb
String does not follow the grammar a^n.b
```