EXPERIMENT 3

Program to construct Predictive/LL(1) Parsing Table
for the grammar rules : A->aBa, B->bB|@. (Note - @ is empty string)
Use the table to parse the sentence: abba$

C PROGRAM:

```
#include<stdlib.h>
#include<string.h>
#include<stdio.h>

char prod[3][10]={"A->aBa", "B->bB", "B->@"}; //Note - @ is considered to be
the empty string.
char input[10], stack[25];

int top=-1;
int j=0,k,l;

//Push function for the stack
void push(char item){
 stack[++top]=item;
}

//Pop function for the stack
void pop(){
 top=top-1;
}

//Function to display the stack
void display(){
 int j;
 for(j=top;j>=0;j--)
  printf("%c",stack[j]);
}

void stackpush(char p){
 if(p=='A'){
  pop();
  for(j=strlen(prod[0])-1; j>=3; j--)
   push(prod[0][j]);
 } else {
  pop();
  for(j=strlen(prod[1])-1; j>=3; j--)
   push(prod[1][j]);
 }
}

void main(){
 char c;
```

```
int i;

printf("Enter the input string terminated with $ to parse: ");
scanf("%s",&input);

for(i=0;input[i]!='\0';i++){
 if((input[i] != 'a') && (input[i] != 'b') && (input[i] != '$')){
  printf("Invalid String.\n");
  exit(0);
 }
}

if(input[i-1] != '$'){
 printf("\n Input String is enetred without the end marker $.\n");
 exit(0);
}

push('$');
push('A');

i=0;

printf("\n\n");
printf("Stack\tInput\tAction\n");

while(i != strlen(input) && stack[top] != '$'){
 printf("\n");
 for(l=top; l>=0; l--)
  printf("%c",stack[l]);
 printf("\t");

 for(l=i; l<strlen(input); l++)
  printf("%c",input[l]);
 printf("\t");

 if(stack[top] == 'A'){
  printf("A->aBa");
  stackpush('A');
 } else if(stack[top] == 'B'){
  if(input[i] != 'b'){
   printf("B->@");
   printf("\t Matched @");
   pop();
  } else {
```

```
    printf("B->bB");
    stackpush('B');
   }
  } else {
   if(stack[top] == input[i]){
    printf("Pop %c",input[i]);
    printf("\t Matched  %c",input[i]);
    pop();
    i++;
   }
   else
    break;
  }
 }

 if(stack[top] == '$' && input[i] == '$'){
  printf("\n$\t$");
  printf("\nThe string is VALID and it is ACCEPTED.\n");
 } else
  printf("\nThe string is INVALID and thus is REJECTED.\n");
}
```

OUTPUT: