Week-3

Lab 2

22/12/23

1. // infix to postfix

```
#include <stdio.h>
#include <stdlib.h>
#include <ctype.h>
#include <string.h>
#define max 100
char s[max];
int top = -1;
void push(char value)
{
    s[++top] = value;
}
char pop()
{
    char value = ' ';
    if (top == -1)
        return value;
    else
        return s[top--];
}
int pre(char value)
{
    if (value == '^')
    {
        return 3;
    }
    else if (value == '*' || value == '/')
        return 2;
    else if (value == '+' || value == '-')
        return 1;
    else
        return 0;
}
```

```
void convert (char infix[], char postfix[])
{
   int i=0, j=0;
   char x;
   while (infix[i]=='\0')
   { if(infix[i]=='(')
      push(infix[i]);
      i++;
     }
   else if (infix[i]==')')
   {
     while (s[top]!='(' && (top!=-1))
     {
        postfix[j++]=pop();
     }
     x=pop();
     i++;
   }
   else if (isalnum (infix[i]))
   {
      postfix[j++]=infix[i];
      i++;
   }
   else
   {
     while ( (s[top]!='(') && (top!=-1) && (prec[top])>=prec[i]))
     {
        postfix[j++]=pop();
     }
     push(infix[i]);
     i++;
   }
}
```

```
while ((s[top] != '(') && (top != -1))
        postfix[j++] = pop();
    postfix[j] = '\0';
}

void main()
{
    char infix[100], postfix[100];
    printf("enter the exp: ");
    scanf("%s", infix);
    convert(infix, postfix);
    printf("postfix: ");
    printf("%s", postfix);
}
```

O/P

enter the exp: ((a*b)+c-d)

postfix: ab*c+d-

2.

```
//postfix evaluation.
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <ctype.h>
#define max 100
char s[max]
int top = -1;
void push(int value)
{
    if (top == max-1)
        printf("overflow, cant push");
```

```
        else
            s[++top] = value;
}
int pop()
{
    int value;
    if (top == -1)
    {
        printf("stack underflow, cant pop\n");
        exit(1);
    }
    else {
        value = s[top--];
        return value;
    }
}
int main()
{
    char exp[100];
    char *e;
    int value = 0;
    printf("enter the exp");
    scanf("%s", exp);
    e = exp;
    while (*e != '\0')
    {
        if (isdigit(*e))
        {
            int num = *e - '0';
            push(num);
        }
        else {
```

```
char op1=pop();
char op2=pop();
switch(*e)
{
    case '+': realve = op1+op2;
              break;
    case '-': realue = op1*op2;
              break;
    case '*': value=op1*op2;
              break;
    case '/': value=op1/op2;
              break;
    }
    push(realue);
  }
  e++;
 }
 printf("eval:%d",pop());
}
```

O/P

enter the exp: 12*34*+5-

eval: 9

3 // linear queque. queue.

```
#include <stdio.h>
#include <stdlib.h>
#define max 4
int rear=-1;
int front=-1;
int q[max];
```

```
void enqueue(int x)
{
    if (rear == max - 1)
        printf("queue overflow\n");
    else if (front == -1 && rear == -1)
    {
        front = rear = 0;
    }
    else {
        rear++;
    }
    q[rear] = x;
}
int dequeue()
{
    int x = -1
    if (front == -1 || front > rear)
    {
        printf("\n underflow");
        return -1;
    }
    else
    {
        x = q[front];
        front++;
        if (front > rear)
            front = rear = -1;
        return x;
    }
}
void display()
{
```

```
if (front == -1 || front > rear){
        printf("\n underflow");
}
else
{
    for(int i=front; i<=rear; i++)
    {
        printf("%d \t", q[i]);
    }
}
}
void main()
{
    int c, no, x;
    while()
    {
      printf("enter 1for insert 2 for delete 3for display 4 for exit\n");
      printf("enter the choice:");
      scanf("%d", &c);
      switch(c)
      {
        case 1: printf("enter the no:");
                scanf("%d", &no);
                enqueue(no);
                break;
        case 2: x = dequeue();
                if (x != -1)
                {
                    printf("%d is popped \n", x);
                }
                break;
        case 3: display();
                break;
```

```
        case 4: exit(0);
        default: printf("invalid\n");
                 break;
        }
    }
}
```

Output

enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice:1
enter the no:10
enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice:1
enter the no:20
enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice:1
enter the no:30
enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice:1
10 20 30 enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice:1
enter the no:40
enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice:1
enter the no:50
queue overflow
enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice:2
10 is popped
enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice:4.