#include<stdio.h>

#include<string.h>

//#include<conio.h>

char arr[50];

char px[100];

int top=-1;

int isfull()

{

if(top>=99)

return 1;

else

return 0;

}

int isempty()

{

if(top<=-1)

return 1;

else

return 0;

}

int push(char data)

{

if(isfull()==1)

{

//printf("stack overflow\n\n");

//return;

}

else

{

top+=1;

arr[top]=data;

// printf("\nITEM INSERTED\n\n");

}

}

int pop()

{

char data;

if(isempty()==1)

{

//printf("stack underflow\n\n");

}

else

{

data=arr[top];

top=top-1;

// printf("\nITEM DELETED\n\n");

}

return data;

}

int peek()

{

return arr[top];

}

int precedence(char ch)

{

switch (ch)

{

case '+':

case '-':

return 1;

case '\*':

case '/':

return 2;

case '^':

return 3;

}

}

void checkexp(char e[])

{

int i;

int p=0;

char t;

for(i=0;i<strlen(e);i++)

{

if(e[i]>='a' && e[i]<='z' || e[i]>='A' && e[i]<='Z')

{

px[p]=e[i];

p++;

}

else if(e[i]=='(')

{

push(e[i]);

}

else if(e[i]=='+' || e[i]=='-' || e[i]=='\*' || e[i]=='^' || e[i]=='/')

{

if(isempty())

{

push(e[i]);

}

else if(peek()=='(' || precedence(e[i])>precedence(peek()))

{

push(e[i]);

}

else

{

while(peek()!='(' && precedence(peek())>=precedence(e[i]))

{

t=pop();

px[p]=t;

p++;

}

push(e[i]);

}

}

else if(e[i]==')')

{

while(peek()!='(')

{

t=pop();

px[p]=t;

p++;

}

t=pop();

}

}

if(isempty())

{

px[p]='\0';

printf("%s",px);

}

else

{

while(!isempty())

{

t=pop();

px[p]=t;

p++;

}

px[p]='\0';

printf("%s",px);

}

}

int main()

{

char exp[100];

int t;

scanf("%d",&t);

while(t--)

{

//printf("Enter the expression:");

scanf("%s",exp);

checkexp(exp);

printf("\n");

}}