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//Implementation of Algorithm 2.4 by C
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#define n 10

typedef int stack[n];
int top;

void push(stack S, int x) {
    top = top + 1;
    if(top == n) {
        printf("Error: Stack overflow.\n");
        exit(0);
    } else {
        S[top] = x;
    }
}

void pop(stack S) {
    if(top == -1) {
        printf("Error: Stack underflow.\n");
        exit(0);
    } else {
        printf("%d\n",S[top]);
        top = top - 1;
    }
}

void initialize_stack(void) {
    top=-1;
}

void show_stack(stack S) {
    int i;

    printf("top = %d, ",top);
    printf("S [");
    for (i=0;i<n;i++) {
        printf(" %3d",S[i]);
        if(i<n-1) printf(",");
    }
    printf("]\n");
}

stack S;

main() {
    int i;

    initialize_stack();

    for (i=0;i<10;i++) {
        push(S,i);
        show_stack(S);
    }

    for (i=0;i<10;i++) {
        pop(S);
    }
}
```