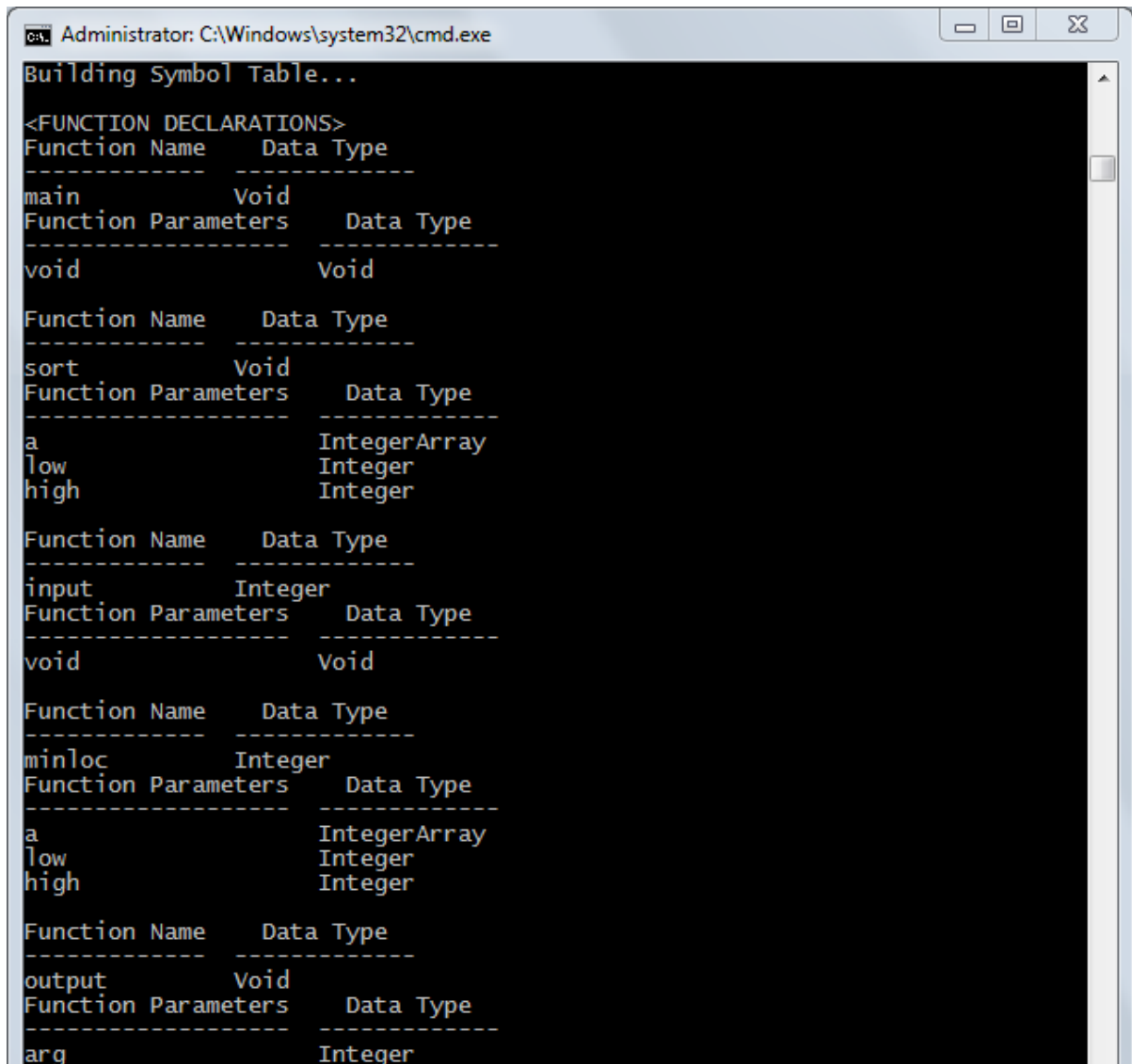


Test code

```
1. /* A program to perform selection sort on a 10 element array */
2. int x[10];
3. int minloc(int a[], int low, int high) {
4.     int i;
5.     int x;
6.     int k;
7.     k = low;
8.     x = a[low];
9.     i = low + 1;
10.    while (i < high) {
11.        if (a[i] < x) {
12.            x = a[i];
13.            k = i;
14.        }
15.        i = i + 1;
16.    }
17.    return k;
18. }
19. void sort(int a[], int low, int high) {
20.     int i;
21.     int k;
22.     i = low;
23.     while (i < high - 1) {
24.         int t;
25.         k = minloc(a, i, high);
26.         t = a[k];
27.         a[k] = a[i];
28.         a[i] = t;
29.         i = i + 1;
30.     }
31. }
32. void main(void) {
33.     int i;
34.     i = 0;
35.     while (i < 10) {
36.         x[i] = input();
37.         i = i + 1;
38.     }
39.     sort(x, 0, 10);
40.     i = 0;
41.     while (i < 10) {
42.         output(x[i]);
43.         i = i + 1;
44.     }
45. }
```

Symbol Table Result

Function Table



```
Administrator: C:\Windows\system32\cmd.exe
Building Symbol Table...

<FUNCTION DECLARATIONS>
Function Name      Data Type
-----
main               Void
Function Parameters Data Type
-----
void               Void

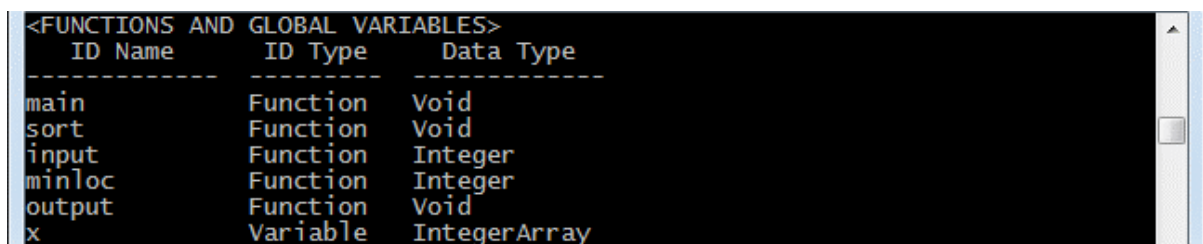
Function Name      Data Type
-----
sort               Void
Function Parameters Data Type
-----
a                  IntegerArray
low                Integer
high               Integer

Function Name      Data Type
-----
input              Integer
Function Parameters Data Type
-----
void               Void

Function Name      Data Type
-----
minloc             Integer
Function Parameters Data Type
-----
a                  IntegerArray
low                Integer
high               Integer

Function Name      Data Type
-----
output             Void
Function Parameters Data Type
-----
arg                Integer
```

Functions and Global Variables



```
<FUNCTIONS AND GLOBAL VARIABLES>
ID Name      ID Type      Data Type
-----
main         Function     Void
sort         Function     Void
input        Function     Integer
minloc       Function     Integer
output       Function     Void
x            Variable     IntegerArray
```

Function Parameters and Local Variables

```
<FUNCTION PARAMETERS AND LOCAL VARIABLES>
function name: minloc (nested level: 1)
  ID Name      ID Type      Data Type
-----
low            Variable      Integer
a              Variable      IntegerArray
i              Variable      Integer
k              Variable      Integer
x              Variable      Integer
high           Variable      Integer

function name: minloc (nested level: 2)
  ID Name      ID Type      Data Type
-----

function name: minloc (nested level: 3)
  ID Name      ID Type      Data Type
-----

function name: sort (nested level: 1)
  ID Name      ID Type      Data Type
-----
low            Variable      Integer
a              Variable      IntegerArray
i              Variable      Integer
k              Variable      Integer
high           Variable      Integer

function name: sort (nested level: 2)
  ID Name      ID Type      Data Type
-----
t              Variable      Integer

function name: main (nested level: 1)
  ID Name      ID Type      Data Type
-----
i              Variable      Integer

function name: main (nested level: 2)
  ID Name      ID Type      Data Type
-----

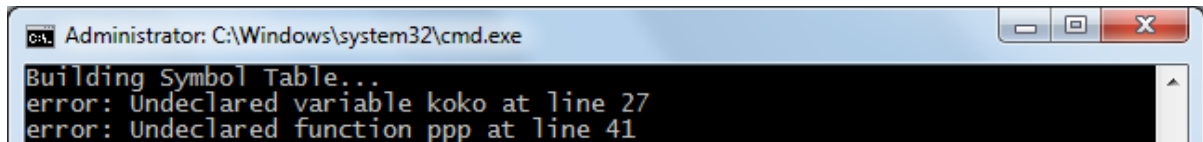
function name: main (nested level: 2)
  ID Name      ID Type      Data Type
-----

Checking Types...
Type Checking Finished
```

Catching Errors

Undefined Variable, Undefined Function

Before printing symbol table

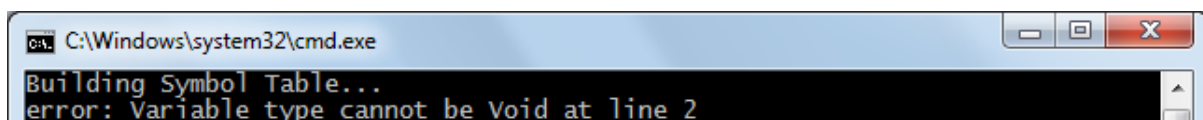


```
Administrator: C:\Windows\system32\cmd.exe
Building Symbol Table...
error: Undeclared variable koko at line 27
error: Undeclared function ppp at line 41
```

Void Variable

Only functions can have void type

Before printing symbol table

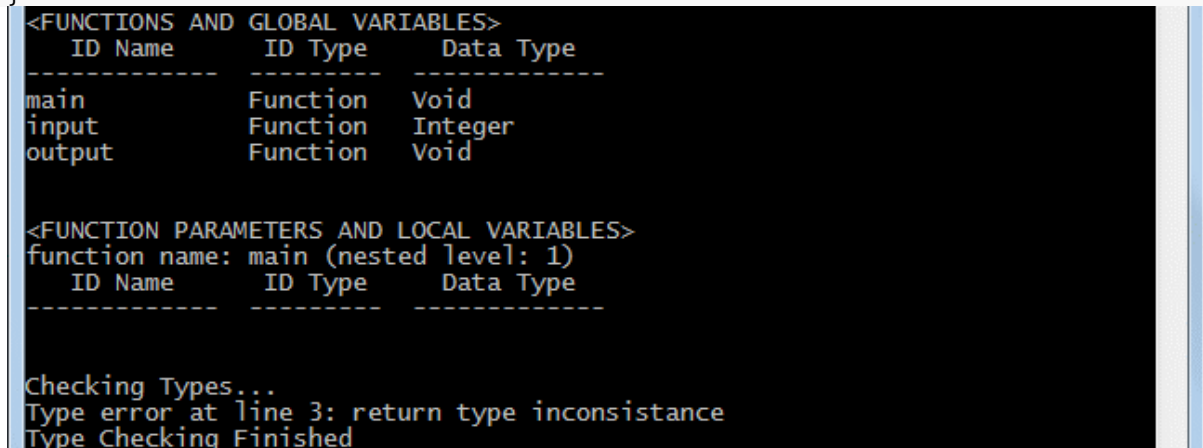


```
C:\Windows\system32\cmd.exe
Building Symbol Table...
error: Variable type cannot be Void at line 2
```

Return Type

In type checking step

```
1. ...
2. ...
3. void main(void) {
4.     return 0;
5. }
```



```
<FUNCTIONS AND GLOBAL VARIABLES>
  ID Name      ID Type      Data Type
-----
main          Function     Void
input         Function     Integer
output        Function     Void

<FUNCTION PARAMETERS AND LOCAL VARIABLES>
function name: main (nested level: 1)
  ID Name      ID Type      Data Type
-----

Checking Types...
Type error at line 3: return type inconsistance
Type Checking Finished
```

```
1. ...
2. int main(void) {
3.     return;
4. }
```

```

<FUNCTIONS AND GLOBAL VARIABLES>
  ID Name      ID Type      Data Type
-----
main           Function     Integer
input          Function     Integer
output         Function     Void

<FUNCTION PARAMETERS AND LOCAL VARIABLES>
function name: main (nested level: 1)
  ID Name      ID Type      Data Type
-----

Checking Types...
Type error at line 3: return type inconsistency
Type Checking Finished

```

Assignment Type

Before printing symbol table

```

1. ...
2. int x[10];
3. x = 3;
4. ...

```

```

Building Symbol Table...
error: Type inconsistency at line 3

<FUNCTION DECLARATIONS>
Function Name      Data Type
-----
main               Integer
Function Parameters Data Type
-----
void               Void

Function Name      Data Type
-----
input              Integer
Function Parameters Data Type
-----
void               Void

Function Name      Data Type
-----
output             Void
Function Parameters Data Type
-----
arg                Integer

<FUNCTIONS AND GLOBAL VARIABLES>
  ID Name      ID Type      Data Type
-----
main           Function     Integer
input          Function     Integer
output         Function     Void

<FUNCTION PARAMETERS AND LOCAL VARIABLES>
function name: main (nested level: 1)
  ID Name      ID Type      Data Type
-----
x              Variable     IntegerArray

```

Function Parameter

Number of parameters, type

In type checking step

```
-----
ID Name      ID Type      Data Type
-----
low          Variable     Integer
a            Variable     IntegerArray
i            Variable     Integer
k            Variable     Integer
x            Variable     Integer
high         Variable     Integer

function name: minloc (nested level: 2)
ID Name      ID Type      Data Type
-----
function name: minloc (nested level: 3)
ID Name      ID Type      Data Type
-----
function name: sort (nested level: 1)
ID Name      ID Type      Data Type
-----
low          Variable     Integer
a            Variable     IntegerArray
i            Variable     Integer
k            Variable     Integer
high         Variable     Integer

function name: sort (nested level: 2)
ID Name      ID Type      Data Type
-----
t            Variable     Integer

function name: main (nested level: 1)
ID Name      ID Type      Data Type
-----
i            Variable     Integer

function name: main (nested level: 2)
ID Name      ID Type      Data Type
-----

function name: main (nested level: 2)
ID Name      ID Type      Data Type
-----

Checking Types...
Type error at line 27: invalid function call
Type Checking Finished
```

Conditional Expression

```
22:      while( ) {
        22: reserved word: while
        22: special symbol: (
        22: special symbol: )
Syntax error at line 22: syntax error
Current token: special symbol: )
```