

פרויקט קומפילציה – חלק שני

שמות המגישים:

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דוגמאות הרצה:

בתוכנית שלנו אנו משתמשים ב- makefile לכן הודעות השגיאה יופיעו בחלון ה- terminal בשורה מספר 4
(1) קיימת פונקציה main בקוד והיא יחידה :

```
part2 ▸ input.code
1  function void main(){
2
3  }
4  function void main(){
5
6  }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
syntax error: found line:4 unexpected token: "function"
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
```

```
part2 ▸ ≡ input.code
1 | function int foo(){}

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
syntax error: found line:1 unexpected token: "}"
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

```
part2 ▸ ≡ input.code
1 | function void main(){
2 |     function void main(){
3 |
4 | }
5 | }
6 |

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
syntax error: found line:2 unexpected token: "main"
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

(2) main לא מקבל ארגומנטים והטיפוס שלו void :

```
part2 ▾ input.code
1 | function int main(){
2 |
3 | }
4 |
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
syntax error: found line:2 unexpected token: "main"
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

```
part2 ▾ input.code
1 | function void main(int x){
2 |
3 | }
4 |
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
syntax error: found line:1 unexpected token: "int"
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

3 (לא קיימות שתי פונקציות עם אותו שם באותו scope

```
part2 ▾ ≡ input.code
1  function void main(){
2      function int foo(){
3          return 0;
4      }
5      function real foo(){
6          return 0;
7      }
8  }
9
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 7: id: [foo] already declared in scope
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

4 (לא קיימים שני משתנים עם אותו שם באותו scope

```
part2 ▸ ≡ input.code
1  function void main(){
2      var int x;
3      var real x;
4  }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
x is already declared
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

5 (פונקציות הוגדרו לפני שמפעילים אותן

```
part2 ▸ ≡ input.code
1  function void main(){
2      foo();
3  }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 2: foo is undefined
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

```
part2 ▾ input.code
1  function void main(){
2      var int x;
3      x=y;
4  }
5  ▶
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 3: y is undefined
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

7 (מספר הארגומנטים האקטואליים שווה למספר הארגומנטים הפורמליים של הפונקציה – כמות הארגומנטים בקריאה לפונקציה צריכה להיות שווה לכמות הארגומנטים בהגדרת הפונקציה.

```
part2 ▾ input.code
1  function void main(){
2      function int foo(int x,y; real z){
3          return 0;
4      }
5      var real a,b,c;
6      foo(a,b,c);
7  }
8  ▶
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 6: wrong argument type in function call : foo
in argument x expected integer and got real
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

8 (טיפוסים של הארגומנטים בקריאה לפונקציה תואמים לטיפוסים בהגדרת הפונקציה

```
part2 ▸ input.code
1  function void main(){
2      function int foo(int x,y; real z){
3          return 0;
4      }
5      var int a,b;
6      foo(a,b);
7  }
8  ▸
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 6: in function: foo expected: 3 arguments and got: 2
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
▮
```

9 (טיפוס הערך המוחזר מהפונקציה תואם לטיפוס ההחזרה המוכרז בכותרת של הפונקציה. וטיפוס ההחזרה של הפונקציה לא יכול להיות מחרוזת

```
part2 ▸ input.code
1  function void main(){
2      function int foo(){
3          return "string";
4      }
5
6  }
7  ▸
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Terminal (Ctrl+;)

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 3: function: foo cannot return string
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
▮
```

```

part2 ▸ ≡ inputcode
1  function void main(){
2      function int foo(){
3          var char x = 'a';
4          return x;
5      }
6
7  }
8

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```

make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 4: function foo expected integer return type, but got char type instead
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1

```

```

part2 ▸ ≡ inputcode
1  function void main(){
2      function int* foo(){
3          var int x = 6;
4          return x;
5      }
6
7  }
8

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```

make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 4: function foo expected int ptr return type, but got integer type instead
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1

```



```
part2 ▸ ≡ input.code
1  function void main(){
2      function real* foo(){
3          var real x = 6.1;
4          return x;
5      }
6  }
7
8
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 4: function foo expected real ptr return type, but got real type instead
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

10) טיפוס הערך המוחזר מהפונקציה תואם לטיפוס המשתנה שלתוכו נכנס הערך שמוחזר מהפונקציה

```
part2 ▸ ≡ input.code
1  function void main(){
2      function int foo(){
3          var int x = 6;
4          return x;
5      }
6      var char y;
7      y = foo();
8
9  }
10
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 7: y is char cannot assign integer
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

```
part2 ▸ ≡ input.code
1  function void main(){
2      if(4){
3
4      }
5
6  }
7  |
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 6: IF condition must be of boolean type not integer
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

```
part2 ▸ ≡ input.code
1  function void main(){
2      if("string"){
3
4      }
5
6  }
7  |
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 6: IF condition must be of boolean type not string
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

12 (טיפוס התנאי ב- while , ב- do-while וב- for הוא מטיפוס bool

```
part2 ▸ ≡ input.code
1  function void main(){
2      while("string"){
3
4      }
5
6  }
7
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 4: WHILE condition must be of boolean type not string
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

```
part2 ▸ ≡ input.code
1  function void main(){
2      do{
3
4      }while("string");
5
6  }
7
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 4: DO-WHILE condition must be of boolean type not string
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

```
part2 ▸ ≡ input.code
1  function void main(){
2  |     for(var int x=1; 2.4; x = x + 1){}
3  |     }
4  |
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 2: FOR condition must be of boolean type not real
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

13) טיפוס הביטוי המופיע כאינדקס ב- [] של מחרוזת הוא מטיפוס int.

```
part2 ▸ ≡ input.code
1  function void main(){
2  |     string a[30];
3  |     a[5 + 5.6];
4  |     }
5  |
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 3: operator: [] can contain only int, but id: a got type: real
bmakefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

```
part2 ▸ ≡ input.code
1  function void main(){
2      string a[30];
3      a['c'];
4  }
5  |
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 3: operator: [] can contain only int, but id: a got type: char
bmakefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

14) לא משתמשים באופרטור [] בשום טיפוס חוץ ממחרוזת

```
part2 ▸ ≡ input.code
1  function void main(){
2      string a[30];
3      var int x;
4      a[5] = 'g';
5      x[6];
6  }
7  |
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 5: operator: [] can be used only on strings, but used on: x with type: integer
bmakefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

15 (טיפוס של המשתנה מצד שמאל של האופרטור השמה) = (תואם לטיפוס הביטוי מצד ימין. לשים לב שלתאים של המחרוזת מותר להכניס רק תווים ו- NULL יכול להיות רק מטיפוס מצביע ל- int, ל- real או ל- char.

```
part2 ▸ ≡ input.code
1  function void main(){
2      string a[30];
3      var int* x = null;
4      var real* y = null;
5      var char* z = null;
6      var int g = null;
7
8
9  }
10
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 6: g is integer cannot assign null
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

```
part2 ▸ ≡ input.code
1  function void main(){
2      string a[30];
3      var int* x = null;
4      var real* y = null;
5      var char* z = null;
6      var int g = x;
7
8
9  }
10
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 6: g is integer cannot assign int ptr
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

```
part2 ▸ ≡ input.code
1  function void main(){
2      string a[30];
3      var int* x = null;
4      var real* y = null;
5      var char* z = null;
6      var int g = 'x';
7
8  }
9
10
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 6: g is integer cannot assign char
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

16 (טיפוסים בביטויים (expressions) תואמים. הכללים הם:

- עבור אופרטורים (+, -, *, /), האופרנדים יכולים להיות int או real והתוצאה היא int אם שני

האופרנדים מטיפוס int, אחרת הטיפוס של הביטוי הוא real

```
part2 ▸ ≡ input.code
1  function void main(){
2      var int x;
3      var real y;
4      x = x + x;
5      x = x - x;
6      y = x + y;
7      x = x + y;
8
9  }
10
11
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 7: x is integer cannot assign real
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

- עבור אופרטורים (&&, ||) שני האופרנדים חייבים להיות bool והתוצאה היא bool

```
part2 ▸ ≡ input.code
1  function void main(){
2      var bool x;
3      var real y;
4      y = x || x;
5  }
6  ▶
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 4: y is real cannot assign boolean
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

```
part2 ▸ ≡ input.code
1  function void main(){
2      var bool x;
3      var real y;
4      y = x && x;
5  }
6  ▶
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 4: y is real cannot assign boolean
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```



```
part2 ▸ ≡ input.code
1  function void main(){
2      var int x;
3      var real y;
4      y = x || x;
5  }
6  ▶
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 4: cannot || between integer and integer
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

- עבור האופרטורים (>=<=><) האופרנדים חייבים להיות int או real והתוצאה היא bool

```
part2 ▸ ≡ input.code
1  function void main(){
2      var bool x;
3      var real y;
4      var bool z;
5      x = z <= y;
6  }
7  ▶
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 5: cannot <= between boolean and real
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

```
part2 ▸ ≡ input.code
1  function void main(){
2      var bool x;
3      var real y;
4      var int z;
5      z = z <= y;
6  }
7  |
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 5: z is integer cannot assign boolean
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

- עבור האופרטורים ($!=$, $==$) שני האופרנדים יכולים להיות שני int, שני bool, שני real, שני char או שני מצביעים לאותו טיפוס. התוצאה היא

```
part2 ▸ ≡ input.code
1  function void main(){
2      var char x;
3      var real y;
4      var bool z;
5      z = x == y;
6  }
7  |
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 5: cannot == between char and real
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

```
part2 ▸ ≡ input.code
1  function void main(){
2      var int* x;
3      var real y;
4      var bool z;
5      y = x == x;
6  }
7
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 5: y is real cannot assign boolean
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

- אופרטור ערך מוחלט (| |) יכול להיות מופעל על מחרוזות והתוצאה היא int

```
part2 ▸ ≡ input.code
1  function void main(){
2      var int* x;
3      string y[30];
4      |x|;
5
6  }
7
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 4: cannot get len of int ptr
[]
```

```
part2 ▸ ≡ input.code
1  function void main(){
2      var int* x;
3      string y[30];
4      x = |y|;
5
6  }
7  |
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 4: x is int ptr cannot assign integer
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

- אופרטור (!) יכול להיות מופעל על bool והתוצאה היא bool

```
part2 ▸ ≡ input.code
1  function void main(){
2      var int x;
3      var bool b;
4      x = !b || b ;
5
6  }
7  ▸
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 4: x is integer cannot assign boolean
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
[]
```

```
part2 ▸ ≡ input.code
1  function void main(){
2      var int x;
3      var bool b;
4      b = !x ;
5
6  }
7
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 4: cannot ! on integer
□
```

17) אפשר רק להוסיף או להפחית int ממצביע

```
part2 ▸ ≡ input.code
1  function void main(){
2      var int* x;
3      x = x + 3;
4      x = x - 3;
5      *x = x - 3;
6  }
7
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 5: dref of x is integer cannot assign int ptr
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

part2 ▸ ≡ input.code

```
1  function void main(){
2      var int x;
3      var real y;
4      var char z;
5      string t[50];
6      var int* g;
7
8      &x;
9      &y;
10     &z;
11     &t[5];
12     &g;
13
14 }
15
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 12: & operator can only be used on char,real,int or string[index] but used on: g with type: int ptr
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```

part2 ▾ input.code

```
1  function void main(){
2      var int* x;
3      var real* y;
4      var char* z;
5      string t[50];
6
7
8      *x;
9      *y;
10     *z;
11     *t;
12
13
14 }
15
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
make all
make[1]: Entering directory '/mnt/d/Desktop/compi/part2'
make[1]: Leaving directory '/mnt/d/Desktop/compi/part2'
line 11: operator * can only be used on pointers but used on string
makefile:10: recipe for target 'run' failed
make: *** [run] Error 1
□
```