Αρχές Γλωσσών Προγραμματισμού

CEID

COMPUTER ENGINEERING & INFORMATICS DEPARTMENT

Αρχές Γλωσσών Προγραμματισμού & Μεταφραστών

Τμήμα Μηχανικών Η/Υ & Πληροφορικής Πανεπιστήμιο Πατρών

Εαρινό Εξάμηνο 2022

Διδάσκοντες: Ι. Γαροφαλάκης, Σ. Σιούτας, Π. Χατζηδούκας

Εργασία των φοιτητών:

ΟΝΟΜΑ: ΣΚΑΓΚΟΣ ΙΩΑΝΝΗΣ ΑΜ:1072611 ΕΤΟΣ:Γ' up1072611@upnet.gr | johnskagos@gmail.com

ΟΝΟΜΑ: ΣΤΕΡΓΙΟΥ ΓΕΩΡΓΙΟΣ ΑΜ:1072503 ΕΤΟΣ:Γ' up1072503@upnet.gr

ΟΝΟΜΑ: ΚΑΠΟΥΛΑΣ ΗΛΙΑΣ ΑΜ:1080479 ΕΤΟΣ:Γ' up1080479@upnet.gr

ΟΝΟΜΑ: ΣΑΡΙΔΑΚΗΣ ΓΕΩΡΓΙΟΣ ΑΜ:1072478 ΕΤΟΣ:Γ' up1072478@upnet.gr

Πίνακας περιεχομένων

1.Εισαγωγή

Σε αυτήν την εργασία κληθήκαμε να γράψουμε ένα λεξικό και έναν συντακτικό αναλυτή για JSON αρχεία. Οι δύο αναλυτές θα πρέπει να μπορούν να αναγνώσουν αρχεία της μορφής last_result.json και range_result.json. Για την παραπάνω υλοποίηση χρησιμοποιήσαμε τα εργαλεία FLEX και BISON όπως ζητήθηκε. Στο παρόν αρχείο υπάρχουν οι σχετικοί κώδικες(FLEX BISON),η γραμματική BNF και παραδείγματα της υλοποίησης. Τυχόν παρατηρήσεις και παραδοχές που κάναμε αναφέρονται παρακάτω.

2.BNF συντακτικού ορισμού γραμματικής (Ερώτημα 1 a.)

(Η παρακάτω BNF δίνεται σε μορφή εισαγωγής σε BISON.)

JSON: rulePROGRAM;

rulePROGRAM: ruleLAST ruleACTIVE | ruleFOTIA;

ruleFOTIA: content COLON OBRACES ruleCONTENT COMMA ruleCONTENT COMMA ruleCONTENT COMMA ruleCONTENT CBRACES COMMA ruleTOTALELEMENTS ruleLASTRANGE ruleNUMBEROFELEMENTS ruleSORT ruleFIRST ruleSIZE ruleNUMBER;

ruleCONTENT: OBRACKETS ruleGAMEID ruleDRAWID ruleDRAWTIME ruleSTATUS ruleDRAWBREAK ruleVISUALDRAW rulePRICEPOINTS ruleWINNINGNUMBERSRANGE rulePRIZECATEGORIESID rulePRIZECATEGORIES ruleWAGERSTATISTICS CBRACKETS;

ruleTOTALPAGES: totalPages COLON INT COMMA;

ruleTOTALELEMENTS: totalElements COLON INT COMMA;

ruleLASTRANGE: last COLON BOOLEAN COMMA;

ruleNUMBEROFELEMENTS: numberOfElements COLON INT COMMA;

ruleSORT: sort COLON OBRACES OBRACKETS ruleDIRECTION rulePROPERTY ruleIGNORECASE ruleNULLHANDLING ruleDESCENDING ruleASCENDING CBRACKETS CBRACES COMMA;

ruleDIRECTION: direction COLON STRING COMMA;

rulePROPERTY: property COLON STRING COMMA;

ruleIGNORECASE: ignoreCase COLON BOOLEAN COMMA;

ruleNULLHANDLING: nullHandling COLON STRING COMMA;

ruleDESCENDING: descending COLON BOOLEAN COMMA;

ruleASCENDING: ascending COLON BOOLEAN;

ruleFIRST: first COLON BOOLEAN COMMA;

ruleSIZE: size COLON INT COMMA;

ruleNUMBER: number COLON INT;

ruleWINNINGNUMBERSRANGE: winningNumbers COLON OBRACKETS ruleLISTR ruleBONUSR CBRACKETS COMMA;

ruleLISTR: list COLON OBRACES INT COMMA INT COMMA INT COMMA INT COMMA INT CBRACES COMMA;

ruleBONUSR: bonus COLON OBRACES INT CBRACES;

ruleLAST: last COLON OBRACKETS ruleGAMEID ruleDRAWID ruleDRAWTIME ruleSTATUS ruleDRAWBREAK ruleVISUALDRAW rulePRICEPOINTS ruleWINNINGNUBMERS rulePRIZECATEGORIESID rulePRIZECATEGORIES ruleWAGERSTATISTICS CBRACKETS COMMA;

ruleACTIVE: active COLON OBRACKETS ruleGAMEID ruleDRAWID ruleDRAWTIME ruleSTATUSA ruleDRAWBREAK ruleVISUALDRAW rulePRICEPOINTS rulePRIZECATEGORIESID rulePRIZECATEGORIES ruleWAGERSTATISTICS CBRACKETS;

ruleGAMEID: gameId COLON INT COMMA;

ruleDRAWID: drawId COLON INT COMMA;

ruleDRAWTIME: drawTime COLON INT COMMA;

ruleSTATUS: status COLON STRING COMMA;

ruleSTATUSA: status COLON active COMMA;

ruleDRAWBREAK: drawBreak COLON INT COMMA;

ruleVISUALDRAW: visualDraw COLON INT COMMA;

rulePRICEPOINTS: pricePoints COLON OBRACKETS ruleAMOUNT CBRACKETS COMMA;

ruleAMOUNT: amount COLON FLOAT;

ruleWINNINGNUBMERS: winningNumbers COLON OBRACKETS ruleLIST ruleBONUS CBRACKETS COMMA;

ruleLIST: list COLON OBRACES INT COMMA INT COMMA INT COMMA INT COMMA INT CBRACES COMMA;

ruleBONUS: bonus COLON OBRACES INT CBRACES;

rulePRIZECATEGORIESID: prizeCategories COLON OBRACES OBRACKETS ruleID ruleDIVIDENT ruleWINNERS ruleDISTRIBUTED ruleJACKPOT ruleFIXED ruleCATEGORYTYPE gameType COLON STRING COMMA ruleMINIMUMDISTRIBUTED CBRACKETS COMMA;

rulePRIZECATEGORIES: ruleNERO COMMA ruleNERO COMMA ruleNERO COMMA ruleNERO COMMA ruleNERO COMMA ruleNERO COMMA ruleNERO COMMA ruleNERO CBRACES COMMA;

ruleNERO: OBRACKETS ruleID ruleDIVIDENT ruleWINNERS ruleDISTRIBUTED ruleJACKPOT ruleFIXED ruleCATEGORYTYPE ruleGAMETYPE CBRACKETS;

ruleID: id COLON INT COMMA;

ruleDIVIDENT: divident COLON FLOAT COMMA;

ruleWINNERS: winners COLON INT COMMA;

ruleDISTRIBUTED: distributed COLON FLOAT COMMA;

ruleJACKPOT: jackpot COLON FLOAT COMMA;

ruleFIXED: fixed COLON FLOAT COMMA;

ruleCATEGORYTYPE: categoryType COLON INT COMMA;

ruleGAMETYPE: gameType COLON STRING;

ruleMINIMUMDISTRIBUTED: minimumDistributed COLON FLOAT;

ruleWAGERSTATISTICS: wagerStatistics COLON OBRACKETS ruleCOLUMNS ruleWAGERS ruleADDON CBRACKETS;

ruleCOLUMNS: columns COLON INT COMMA;

ruleWAGERS: wagers COLON INT COMMA;

ruleADDON: addOn COLON OBRACES CBRACES;

3. ΚΩΔΙΚΑΣ FLEX (ΕΡΩΤΗΜΑΤΑ 1 b. & 2)

kap.l × kapabison.y test.c

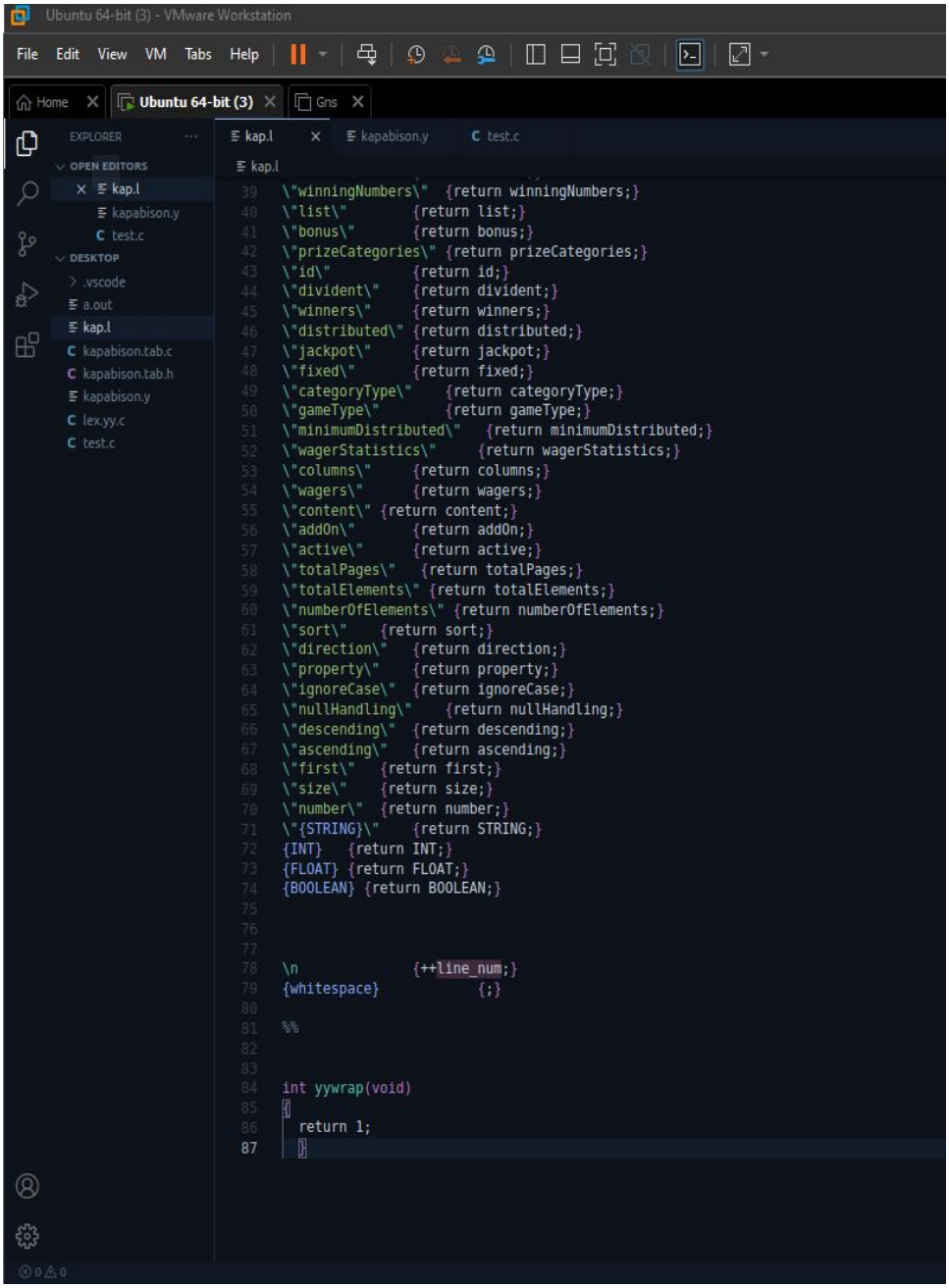
kap.l

```
%{
#include <stdio.h>
#include <stdlib.h>
#include "kapabison.tab.h"
#include <string.h>
#include <unistd.h>
#define MAX_STR_CONST 1025
int line_num=1;
int line_init=-1;
char*str_buf[MAX_STR_CONST];
char*str_buf_ptr;
%}


INT     [1-9][0-9]*|0
FLOAT   [0-9]*\.?[0-9]*
STRING  (\\.|[^\"])*
BOOLEAN ("true"|"false")
whitespace [\t\n\r]

%%


:       {return COLON;}
,   {return COMMA;}
\{      {return OBRACKETS;}
\}      {return CBRACKETS;}
\[      {return OBRACES;}
\]      {return CBRACES;}
\"last\"    {return last;}
\"gameId\"  {return gameId;}
\"drawId\"  {return drawId;}
\"drawTime\"    {return drawTime;}
\"status\"      {return status;}
\"visualDraw\"  {return visualDraw;}
\"drawBreak\"    {return drawBreak;}
\"pricePoints\" {return pricePoints;}
\"amount\"      {return amount;}
\"winningNumbers\"  {return winningNumbers;}
\"list\"        {return list;}
\"bonus\"       {return bonus;}
```



Παρατήρηση ARRAY

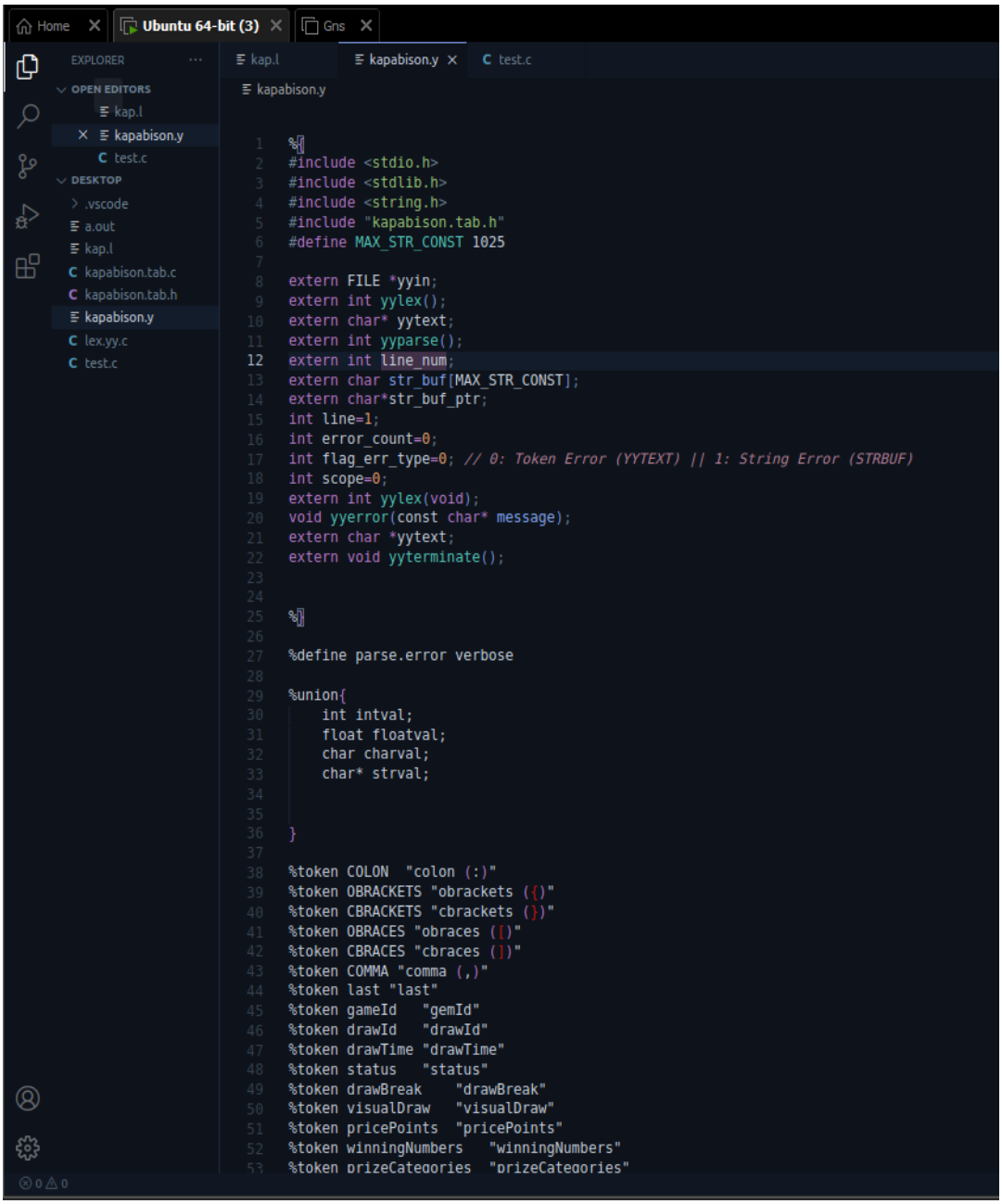
ARRAY [(([+-]?[0-9]|[+-]?[0-9]{STRING})(\s,\s)?)]

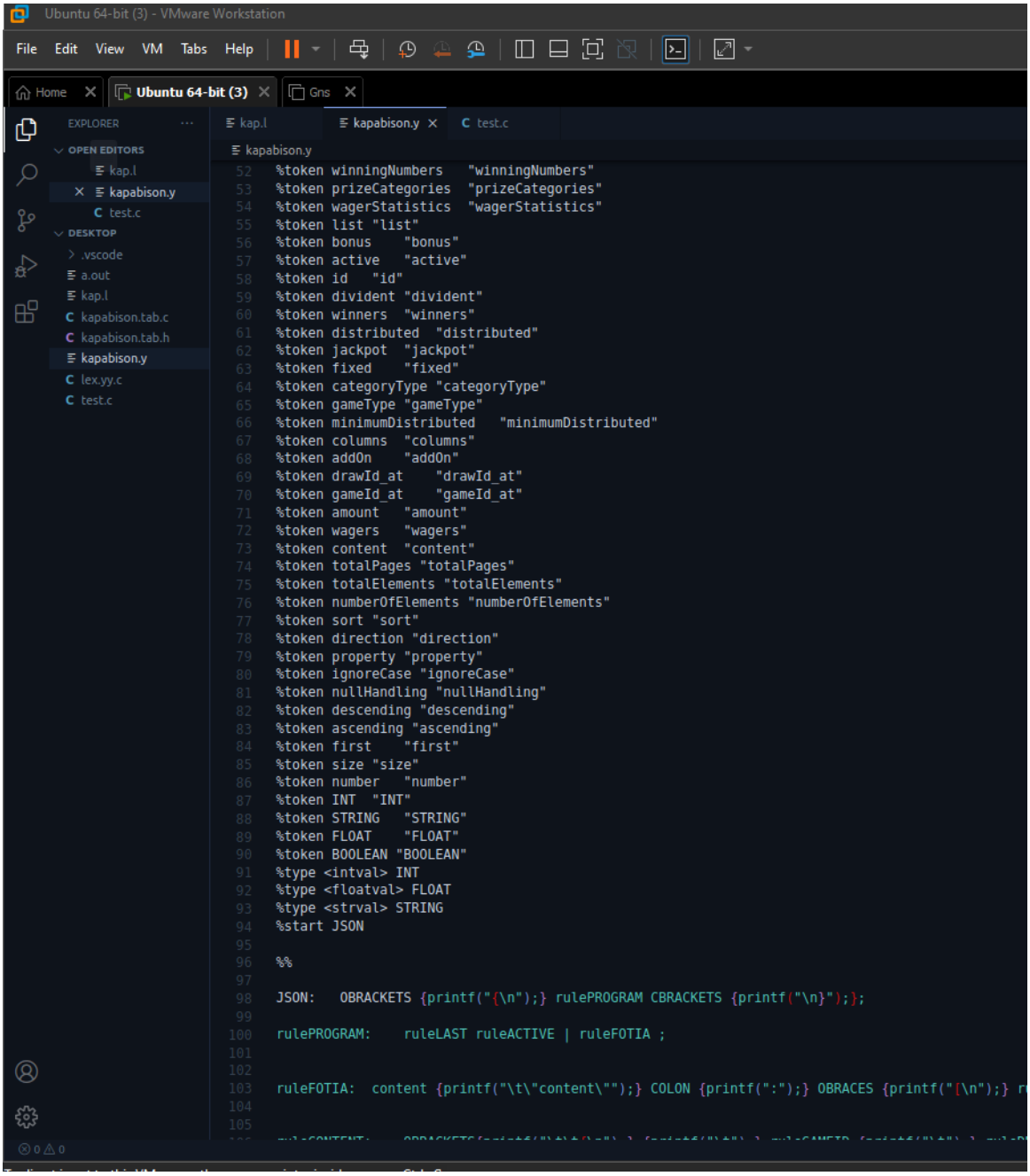
{ARRAY} {return ARRAY;}

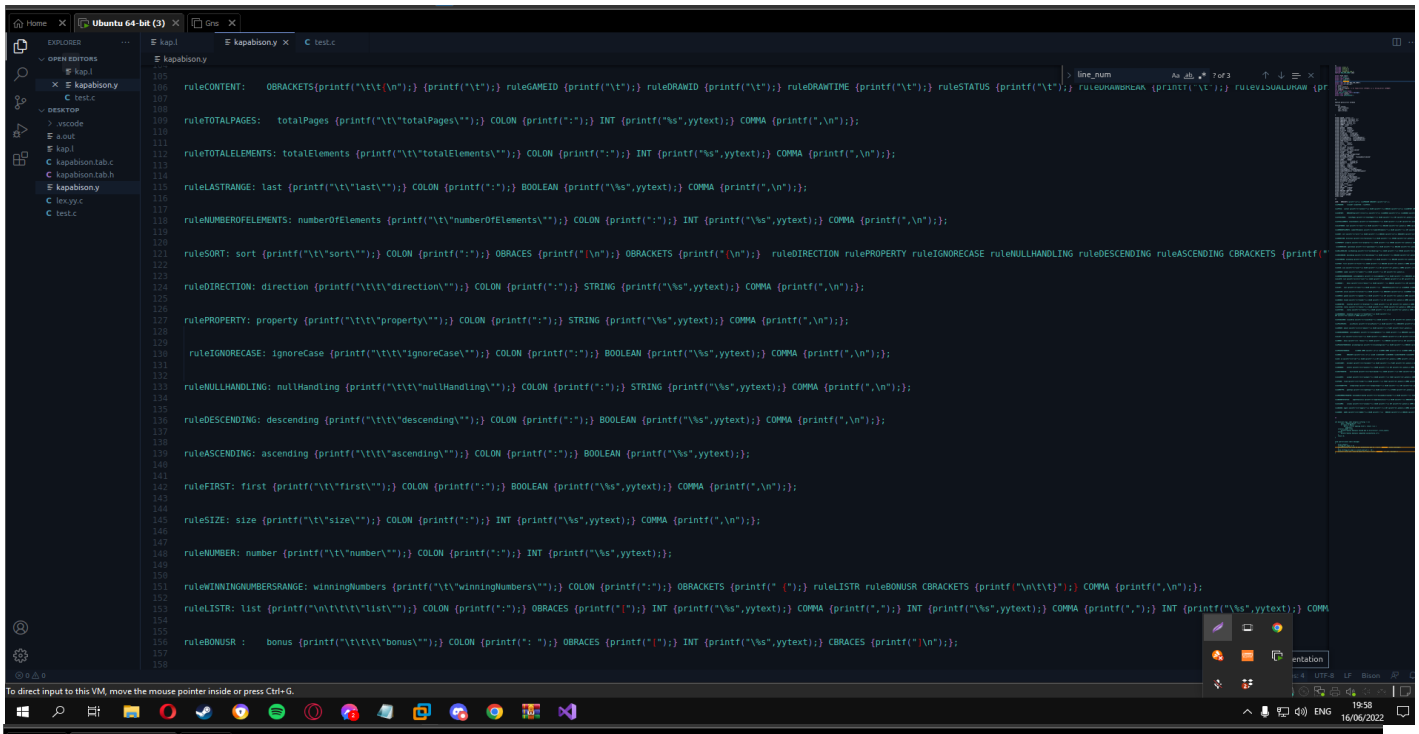
Πραγματοποιήσαμε κανονική έκφραση για json Array όπως ζητείται από την εκφώνηση. Ενώ όταν τρέχαμε τον λεκτικό αναλυτή στο αρχείο last_result λαμβάναμε ως έξοδο ένα στοιχείο Array, όταν υλοποιήσαμε τον κώδικα bison κατά την μεταγλώττιση (gcc) εμφανιζόταν error στην γραμμή όπου ήταν δηλωμένο το token για την μορφή json Array ({ARRAY} {return ARRAY;}). Για αυτό αναγκαστήκαμε να

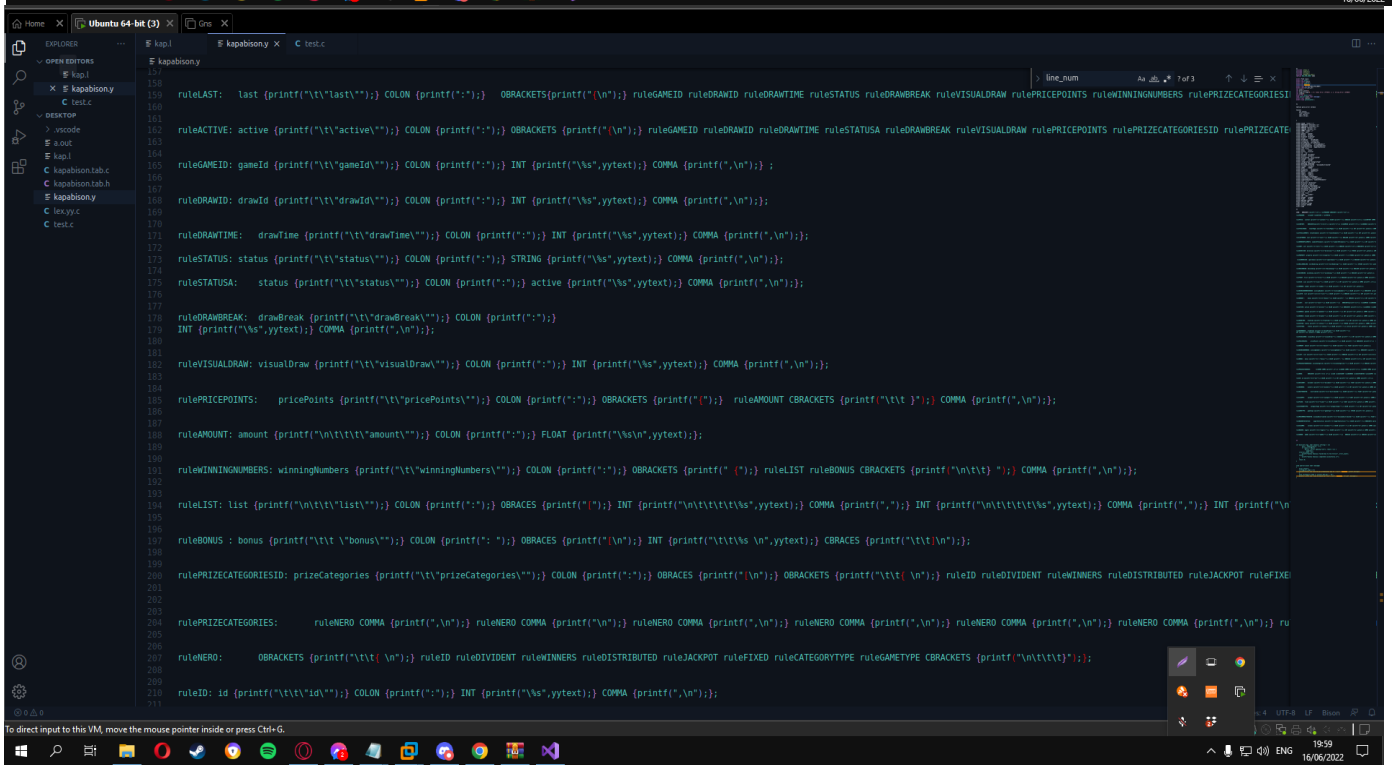
σβήσουμε το token Array και να διαβάζουμε τους πίνακες με απλούστερη μορφή, δηλαδή τα στοιχειά που βρίσκονται ανάμεσα σε αγκύλες[ ] όπως φαίνεται και στον κώδικα bison παρακάτω.

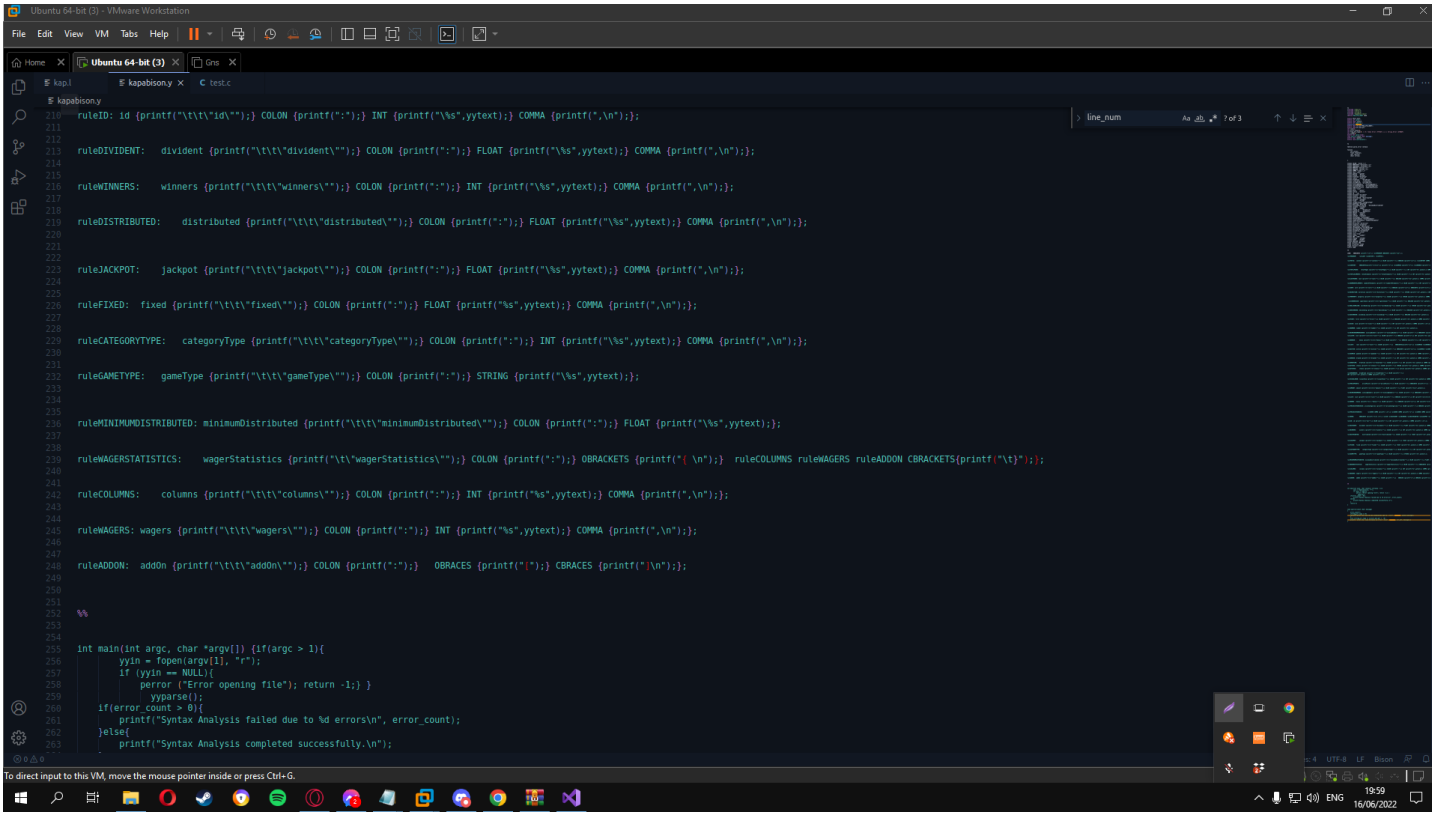
4. ΚΩΔΙΚΑΣ BISON (ΕΡΩΤΗΜΑΤΑ 1 b. & 2)

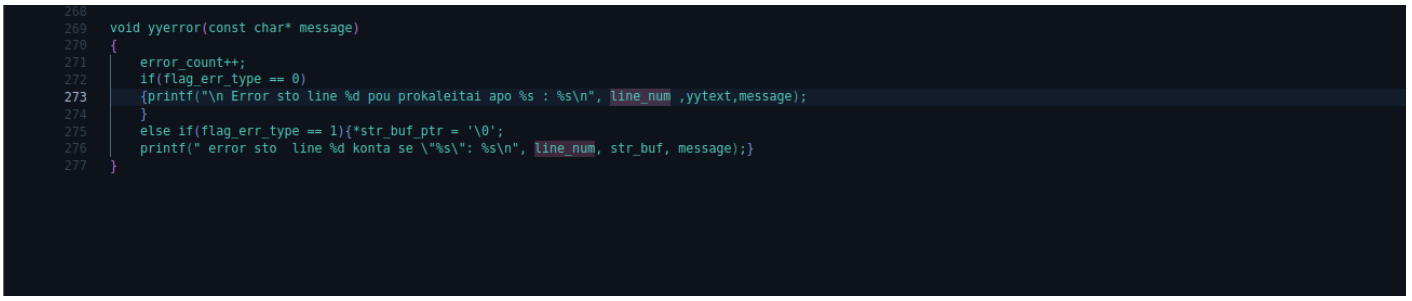



Ubuntu 64-bit (3) - VMware Workstation
File Edit View VM Tabs Help
Home
Ubuntu 64-bit (3)
Gns
EXPLORER
OPEN EDITORS
kap.l
kapabison.y
test.c
DESKTOP
.vscode
a.out
kap.l
kapabison.tab.c
kapabison.tab.h
kapabison.y
lex.yy.c
test.c
kap.l
kapabison.y
test.c
kapabison.y
%token winningNumbers "winningNumbers"
%token prizeCategories "prizeCategories"
%token wagerStatistics "wagerStatistics"
%token list "list"
%token bonus "bonus"
%token active "active"
%token id "id"
%token divident "divident"
%token winners "winners"
%token distributed "distributed"
%token jackpot "jackpot"
%token fixed "fixed"
%token categoryType "categoryType"
%token gameType "gameType"
%token minimumDistributed "minimumDistributed"
%token columns "columns"
%token addOn "addOn"
%token drawId_at "drawId_at"
%token gameId_at "gameId_at"
%token amount "amount"
%token wagers "wagers"
%token content "content"
%token totalPages "totalPages"
%token totalElements "totalElements"
%token numberOfElements "numberOfElements"
%token sort "sort"
%token direction "direction"
%token property "property"
%token ignoreCase "ignoreCase"
%token nullHandling "nullHandling"
%token descending "descending"
%token ascending "ascending"
%token first "first"
%token size "size"
%token number "number"
%token INT "INT"
%token STRING "STRING"
%token FLOAT "FLOAT"
%token BOOLEAN "BOOLEAN"
%type <intval> INT
%type <floatval> FLOAT
%type <strval> STRING
%start JSON
%%
JSON: OBRACKETS {printf("{\n");} rulePROGRAM CBRACKETS {printf("\n}");};
rulePROGRAM: ruleLAST ruleACTIVE | ruleFOTIA ;
ruleFOTIA: content {printf("\t\"content\"");} COLON {printf(":");} OBRACES {printf("[\n");}


Home
Ubuntu 64-bit (3)
Gns
kap.l
kapabison.y
test.c
EXPLORER
OPEN EDITORS
DESKTOP
ruleCONTENT: OBRACKETS{printf("\t\t{\n");} {printf("\t");} ruleGAMEID {printf("\t");} ruleDRAWID {printf("\t");} ruleDRAWTIME {printf("\t");} ruleSTATUS {printf("\t");}
ruleTOTALPAGES: totalPages {printf("\t\t"totalPages\"");} COLON {printf(":");} INT {printf("%s",yytext);} COMMA {printf(",\n");};
ruleTOTALELEMENTS: totalElements {printf("\t\t"totalElements\"");} COLON {printf(":");} INT {printf("%s",yytext);} COMMA {printf(",\n");};
ruleLASTRANGE: last {printf("\t\t"last\"");} COLON {printf(":");} BOOLEAN {printf("\%s",yytext);} COMMA {printf(",\n");};
ruleNUMBEROFELEMENTS: numberOfElements {printf("\t\t"numberOfElements\"");} COLON {printf(":");} INT {printf("\%s",yytext);} COMMA {printf(",\n");};
ruleSORT: sort {printf("\t\t"sort\"");} COLON {printf(":");} OBRACES {printf("{\n");} OBRACKETS {printf("{\n");} ruleDIRECTION rulePROPERTY ruleIGNORECASE ruleNULLHANDLING ruleDESCENDING ruleASCENDING CBRACKETS {printf("
ruleDIRECTION: direction {printf("\t\t\t"direction\"");} COLON {printf(":");} STRING {printf("\%s",yytext);} COMMA {printf(",\n");};
rulePROPERTY: property {printf("\t\t\t"property\"");} COLON {printf(":");} STRING {printf("\%s",yytext);} COMMA {printf(",\n");};
ruleIGNORECASE: ignoreCase {printf("\t\t\t"ignoreCase\"");} COLON {printf(":");} BOOLEAN {printf("\%s",yytext);} COMMA {printf(",\n");};
ruleNULLHANDLING: nullHandling {printf("\t\t\t"nullHandling\"");} COLON {printf(":");} STRING {printf("\%s",yytext);} COMMA {printf(",\n");};
ruleDESCENDING: descending {printf("\t\t\t"descending\"");} COLON {printf(":");} BOOLEAN {printf("\%s",yytext);} COMMA {printf(",\n");};
ruleASCENDING: ascending {printf("\t\t\t"ascending\"");} COLON {printf(":");} BOOLEAN {printf("\%s",yytext);};
ruleFIRST: first {printf("\t\t"first\"");} COLON {printf(":");} BOOLEAN {printf("\%s",yytext);} COMMA {printf(",\n");};
ruleSIZE: size {printf("\t\t"size\"");} COLON {printf(":");} INT {printf("\%s",yytext);} COMMA {printf(",\n");};
ruleNUMBER: number {printf("\t\t"number\"");} COLON {printf(":");} INT {printf("\%s",yytext);};
ruleWINNINGNUMBERSRANGE: winningNumbers {printf("\t\t"winningNumbers\"");} COLON {printf(":");} OBRACKETS {printf(" {");} ruleLISTR ruleBONUSR CBRACKETS {printf("\n\t\t}");} COMMA {printf(",\n");};
ruleLISTR: list {printf("\n\t\t\t\t"list\"");} COLON {printf(":");} OBRACES {printf("[");} INT {printf("\%s",yytext);} COMMA {printf(",");} INT {printf("\%s",yytext);} COMMA {printf(",");} INT {printf("\%s",yytext);} COMM
ruleBONUSR : bonus {printf("\t\t\t\t"bonus\"");} COLON {printf(": ");} OBRACES {printf("[");} INT {printf("\%s",yytext);} CBRACES {printf("]\n");};
To direct input to this VM, move the mouse pointer inside or press Ctrl+G.
ENG
19:58
16/06/2022


Home
Ubuntu 64-bit (3)
Gns
kap.l
kapabison.y
test.c
EXPLORER
OPEN EDITORS
DESKTOP
ruleLAST: last {printf("\t\t"last\"");} COLON {printf(":");} OBRACKETS{printf("{\n");} ruleGAMEID ruleDRAWID ruleDRAWTIME ruleSTATUS ruleDRAWBREAK ruleVISUALDRAW rulePRICEPOINTS ruleWINNINGNUMBERS rulePRIZECATEGORIESI
ruleACTIVE: active {printf("\t\t"active\"");} COLON {printf(":");} OBRACKETS {printf("{\n");} ruleGAMEID ruleDRAWID ruleDRAWTIME ruleSTATUSA ruleDRAWBREAK ruleVISUALDRAW rulePRICEPOINTS rulePRIZECATEGORIESID rulePRIZECATE
ruleGAMEID: gameId {printf("\t\t"gameId\"");} COLON {printf(":");} INT {printf("\%s",yytext);} COMMA {printf(",\n");} ;
ruleDRAWID: drawId {printf("\t\t"drawId\"");} COLON {printf(":");} INT {printf("\%s",yytext);} COMMA {printf(",\n");};
ruleDRAWTIME: drawTime {printf("\t\t"drawTime\"");} COLON {printf(":");} INT {printf("\%s",yytext);} COMMA {printf(",\n");};
ruleSTATUS: status {printf("\t\t"status\"");} COLON {printf(":");} STRING {printf("\%s",yytext);} COMMA {printf(",\n");};
ruleSTATUSA: status {printf("\t\t"status\"");} COLON {printf(":");} active {printf("\%s",yytext);} COMMA {printf(",\n");};
ruleDRAWBREAK: drawBreak {printf("\t\t"drawBreak\"");} COLON {printf(":");}
INT {printf("\%s",yytext);} COMMA {printf(",\n");};
ruleVISUALDRAW: visualDraw {printf("\t\t"visualDraw\"");} COLON {printf(":");} INT {printf("\%s",yytext);} COMMA {printf(",\n");};
rulePRICEPOINTS: pricePoints {printf("\t\t"pricePoints\"");} COLON {printf(":");} OBRACKETS {printf("{");} ruleAMOUNT CBRACKETS {printf("\t\t }");} COMMA {printf(",\n");};
ruleAMOUNT: amount {printf("\n\t\t\t\t"amount\"");} COLON {printf(":");} FLOAT {printf("\%s\n",yytext);};
ruleWINNINGNUMBERS: winningNumbers {printf("\t\t"winningNumbers\"");} COLON {printf(":");} OBRACKETS {printf(" {");} ruleLIST ruleBONUS CBRACKETS {printf("\n\t\t} ");} COMMA {printf(",\n");};
ruleLIST: list {printf("\n\t\t\t"list\"");} COLON {printf(":");} OBRACES {printf("[");} INT {printf("\n\t\t\t\t\t\%s",yytext);} COMMA {printf(",");} INT {printf("\n\t\t\t\t\t\%s",yytext);} COMMA {printf(",");} INT {printf("\n
ruleBONUS : bonus {printf("\t\t \"bonus\"");} COLON {printf(": ");} OBRACES {printf("[\n");} INT {printf("\t\t\%s \n",yytext);} CBRACES {printf("\t\t]\n");};
rulePRIZECATEGORIESID: prizeCategories {printf("\t\t"prizeCategories\"");} COLON {printf(":");} OBRACES {printf("[\n");} OBRACKETS {printf("\t\t{ \n");} ruleID ruleDIVIDENT ruleWINNERS ruleDISTRIBUTED ruleJACKPOT ruleFIXE
rulePRIZECATEGORIES: ruleNERO COMMA {printf(",\n");} ruleNERO COMMA {printf("\n");} ruleNERO COMMA {printf(",\n");} ruleNERO COMMA {printf(",\n");} ruleNERO COMMA {printf(",\n");} ruleNERO COMMA {printf(",\n");} ru
ruleNERO: OBRACKETS {printf("\t\t{ \n");} ruleID ruleDIVIDENT ruleWINNERS ruleDISTRIBUTED ruleJACKPOT ruleFIXED ruleCATEGORYTYPE ruleGAMETYPE CBRACKETS {printf("\n\t\t\t}");};
ruleID: id {printf("\t\t\t"id\"");} COLON {printf(":");} INT {printf("\%s",yytext);} COMMA {printf(",\n");};
To direct input to this VM, move the mouse pointer inside or press Ctrl+G.
ENG
19:59
16/06/2022

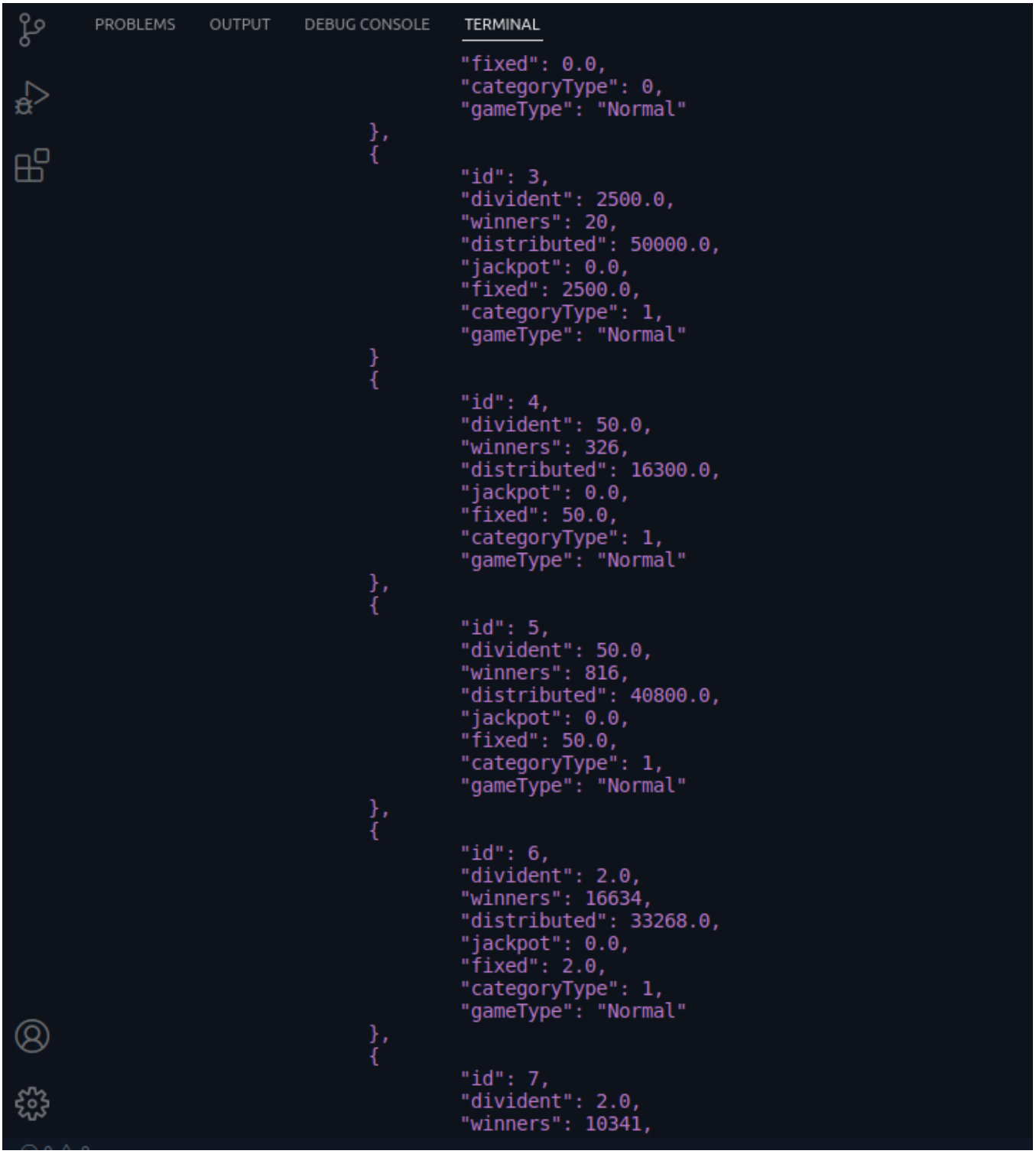




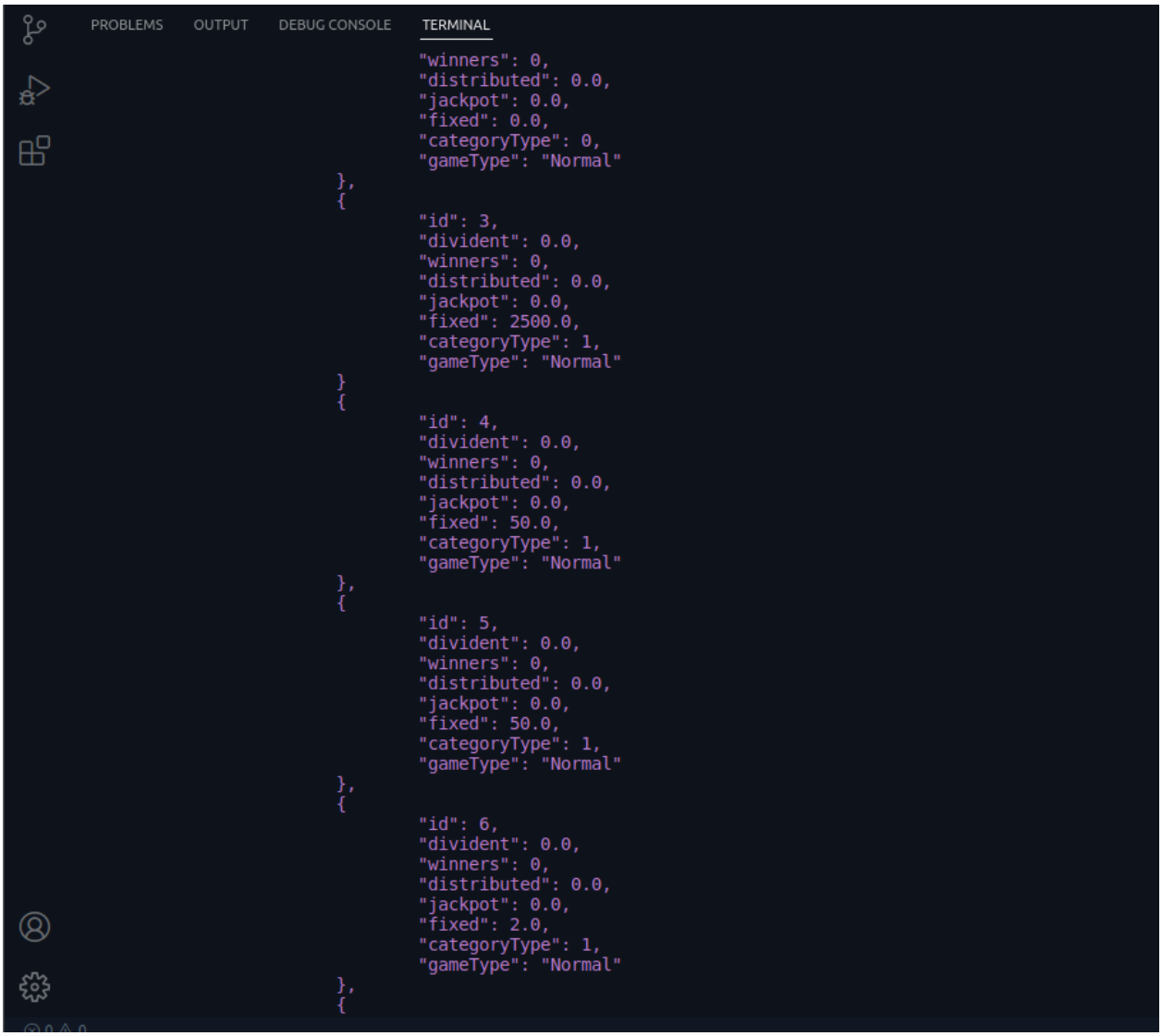
(Παρακαλούμε για να δείτε τον κώδικα στα παραπάνω screenshots μεγεθύνεται από το word στο 200 καθώς δεν μπορούσαμε να μεγεθύνουμε περισσότερο χωρίς να χαθεί κάτι).

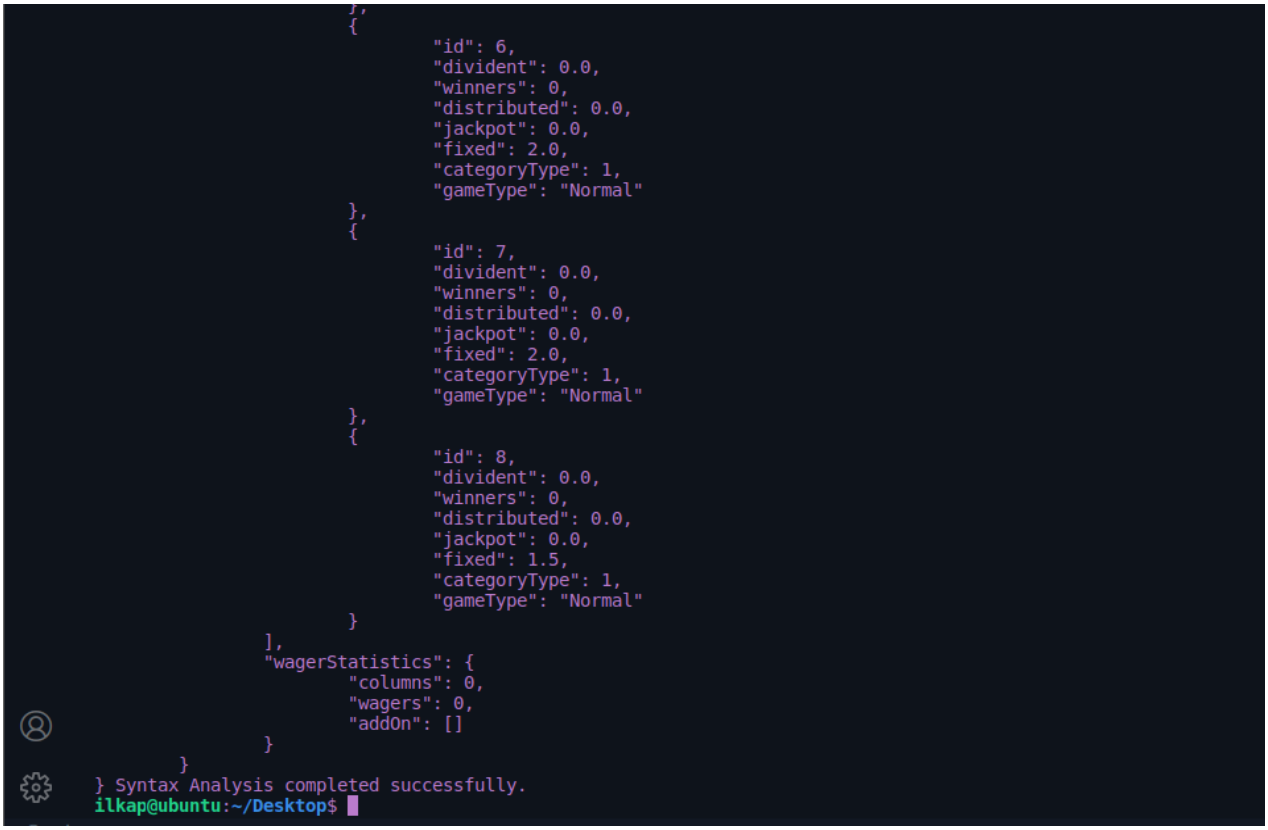
5. Παραδείγματα εκτέλεσης

→Παράδειγμα σωστής εκτέλεσης του αρχείου last_result και εκτύπωσης του από τον συντακτικό μας αναλυτή.

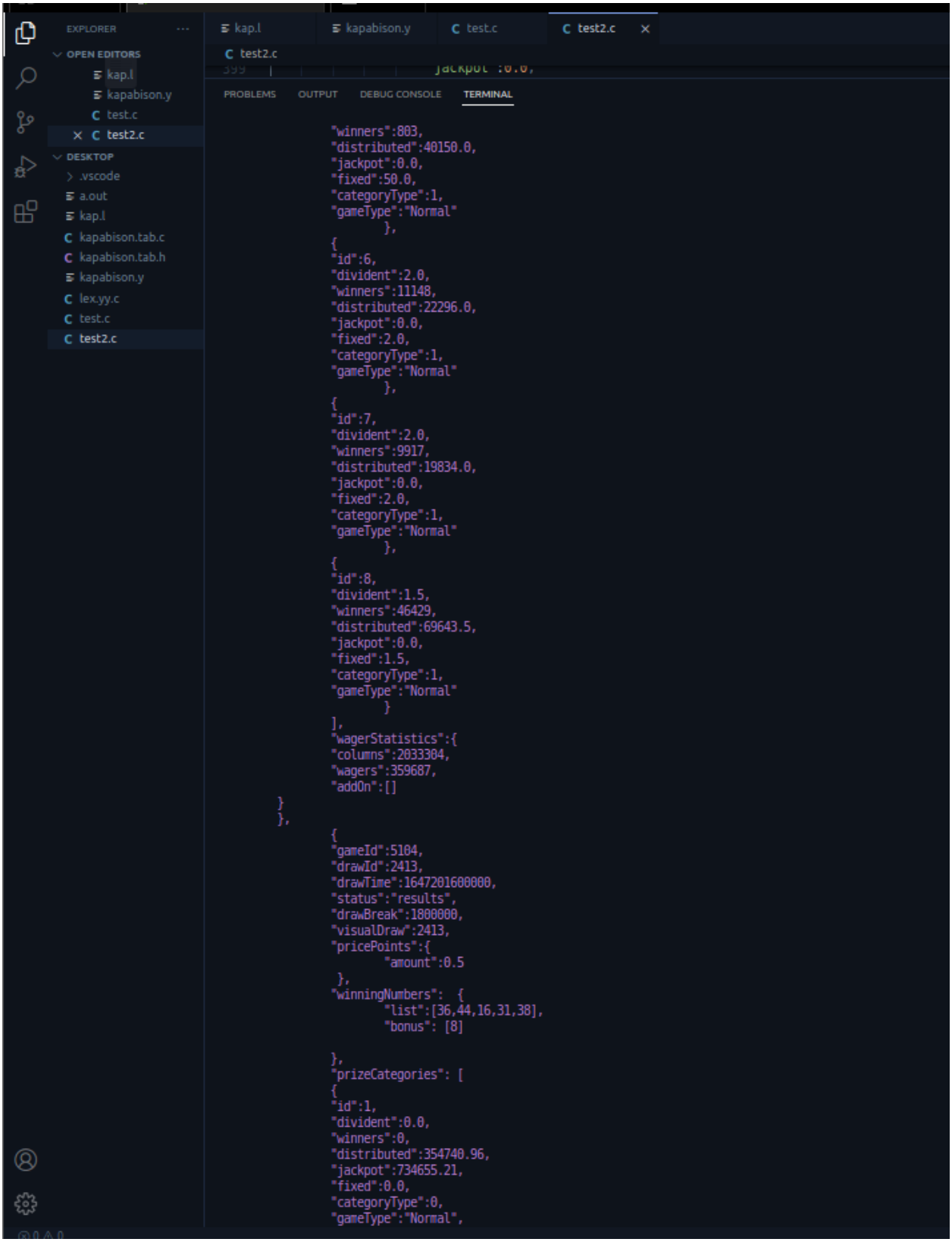

PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
"fixed": 0.0,
"categoryType": 0,
"gameType": "Normal"
},
{
"id": 3,
"divident": 2500.0,
"winners": 20,
"distributed": 50000.0,
"jackpot": 0.0,
"fixed": 2500.0,
"categoryType": 1,
"gameType": "Normal"
}
{
"id": 4,
"divident": 50.0,
"winners": 326,
"distributed": 16300.0,
"jackpot": 0.0,
"fixed": 50.0,
"categoryType": 1,
"gameType": "Normal"
},
{
"id": 5,
"divident": 50.0,
"winners": 816,
"distributed": 40800.0,
"jackpot": 0.0,
"fixed": 50.0,
"categoryType": 1,
"gameType": "Normal"
},
{
"id": 6,
"divident": 2.0,
"winners": 16634,
"distributed": 33268.0,
"jackpot": 0.0,
"fixed": 2.0,
"categoryType": 1,
"gameType": "Normal"
},
{
"id": 7,
"divident": 2.0,
"winners": 10341,

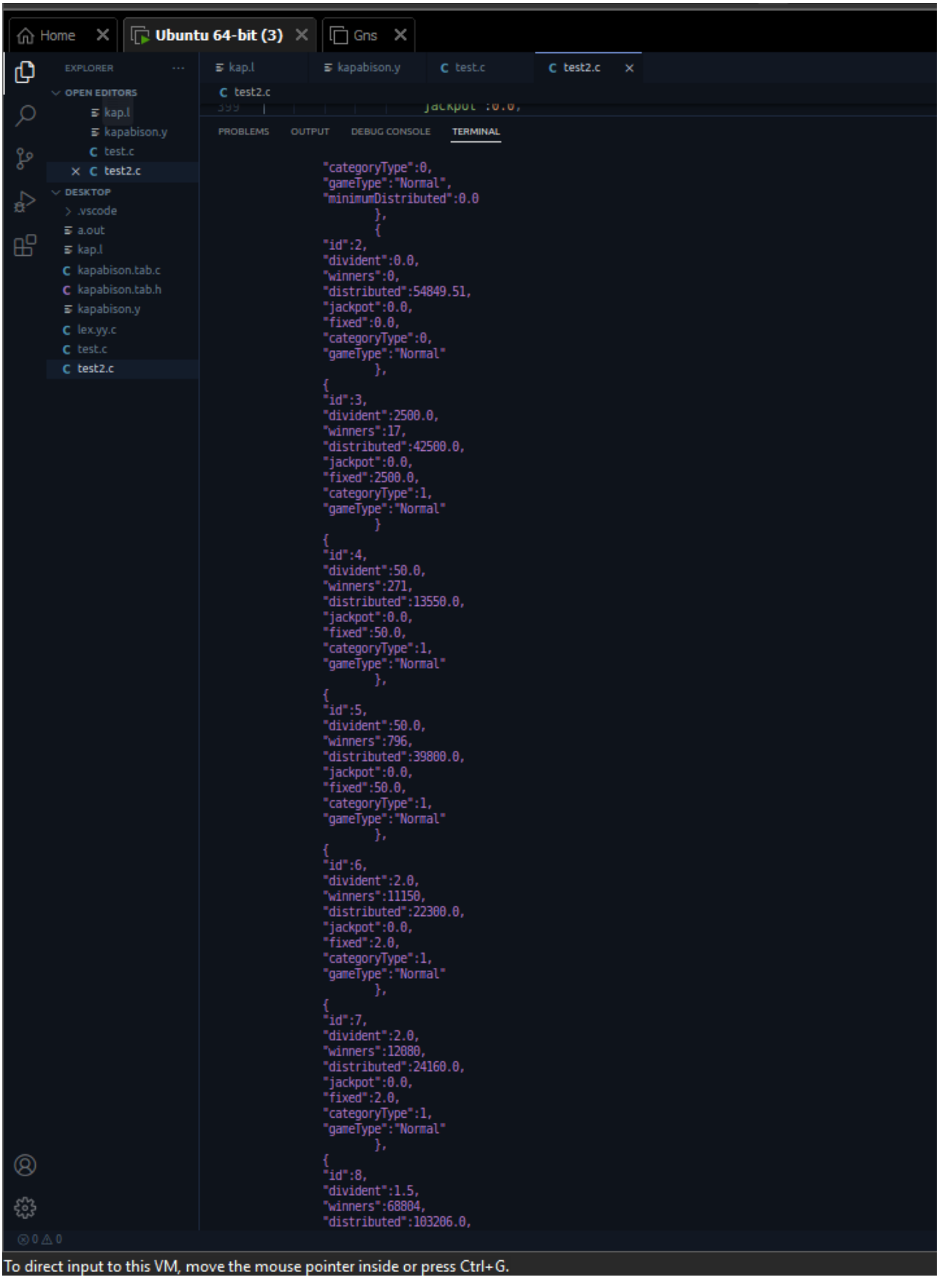

PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
"fixed": 2.0,
"categoryType": 1,
"gameType": "Normal"
},
{
"id": 8,
"divident": 1.5,
"winners": 49233,
"distributed": 73849.5,
"jackpot": 0.0,
"fixed": 1.5,
"categoryType": 1,
"gameType": "Normal"
}
],
"wagerStatistics": {
"columns": 2866438,
"wagers": 503579,
"addOn": []
}
},
"active": {
"gameId": 5104,
"drawId": 2391,
"drawTime": 1642536000000,
"status": "active",
"drawBreak": 1800000,
"visualDraw": 2391,
"pricePoints": {
"amount": 0.5
},
"prizeCategories": [
{
"id": 1,
"divident": 0.0,
"winners": 0,
"distributed": 0.0,
"jackpot": 1105825.68,
"fixed": 0.0,
"categoryType": 0,
"gameType": "Normal",
"minimumDistributed": 1300000.0
},
{
"id": 2,
"divident": 0.0,
"winners": 0,
"distributed": 0.0,


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
"winners": 0,
"distributed": 0.0,
"jackpot": 0.0,
"fixed": 0.0,
"categoryType": 0,
"gameType": "Normal"
},
{
"id": 3,
"divident": 0.0,
"winners": 0,
"distributed": 0.0,
"jackpot": 0.0,
"fixed": 2500.0,
"categoryType": 1,
"gameType": "Normal"
}
{
"id": 4,
"divident": 0.0,
"winners": 0,
"distributed": 0.0,
"jackpot": 0.0,
"fixed": 50.0,
"categoryType": 1,
"gameType": "Normal"
},
{
"id": 5,
"divident": 0.0,
"winners": 0,
"distributed": 0.0,
"jackpot": 0.0,
"fixed": 50.0,
"categoryType": 1,
"gameType": "Normal"
},
{
"id": 6,
"divident": 0.0,
"winners": 0,
"distributed": 0.0,
"jackpot": 0.0,
"fixed": 2.0,
"categoryType": 1,
"gameType": "Normal"
},
{

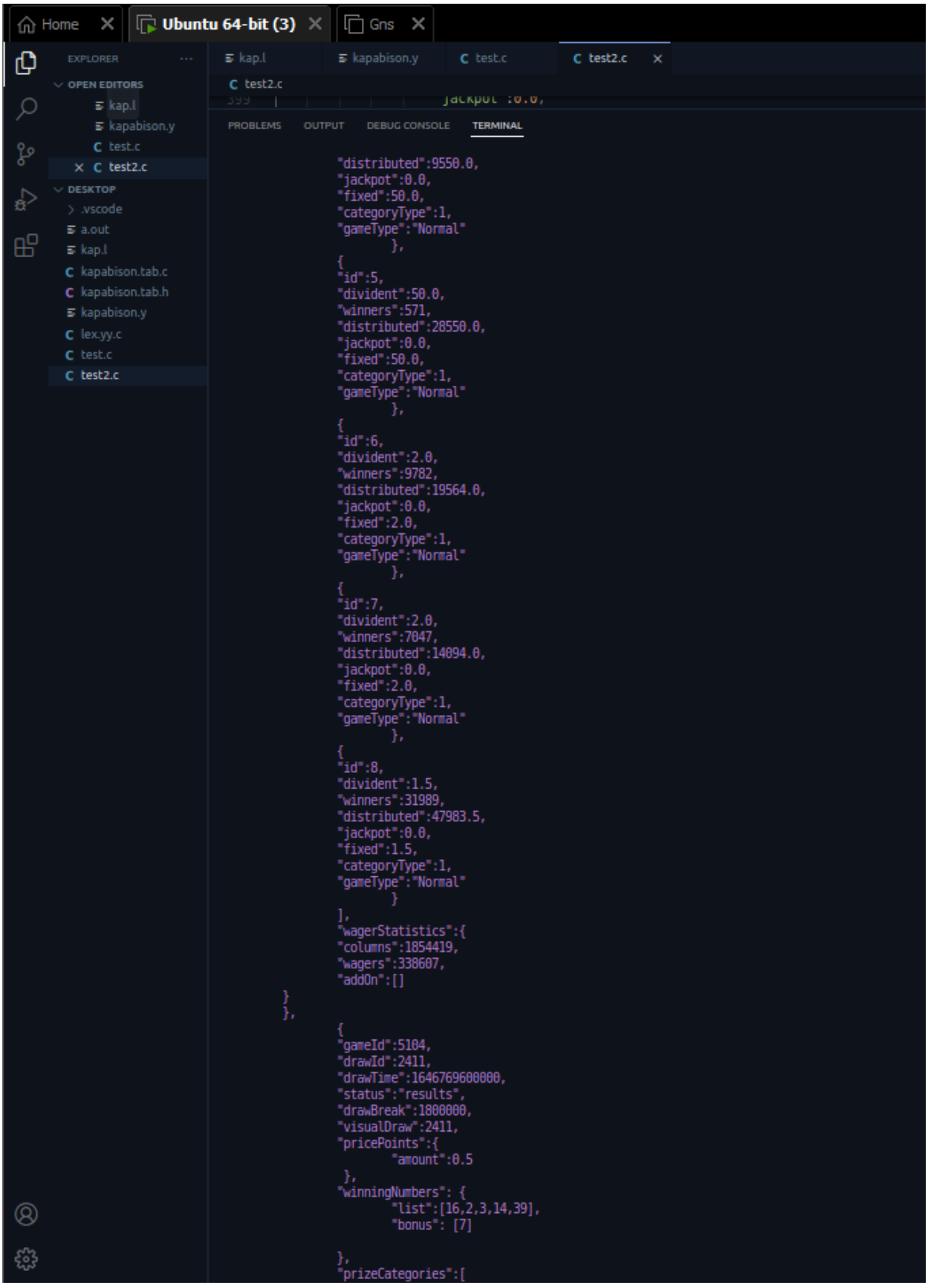

},
{
"id": 6,
"divident": 0.0,
"winners": 0,
"distributed": 0.0,
"jackpot": 0.0,
"fixed": 2.0,
"categoryType": 1,
"gameType": "Normal"
},
{
"id": 7,
"divident": 0.0,
"winners": 0,
"distributed": 0.0,
"jackpot": 0.0,
"fixed": 2.0,
"categoryType": 1,
"gameType": "Normal"
},
{
"id": 8,
"divident": 0.0,
"winners": 0,
"distributed": 0.0,
"jackpot": 0.0,
"fixed": 1.5,
"categoryType": 1,
"gameType": "Normal"
}
],
"wagerStatistics": {
"columns": 0,
"wagers": 0,
"addOn": []
}
}
} Syntax Analysis completed successfully.
ilkap@ubuntu:~/Desktop$

→Παράδειγμα σωστής εκτέλεσης του αρχείου range_result και εκτύπωσης του από τον συντακτικό μας αναλυτή.

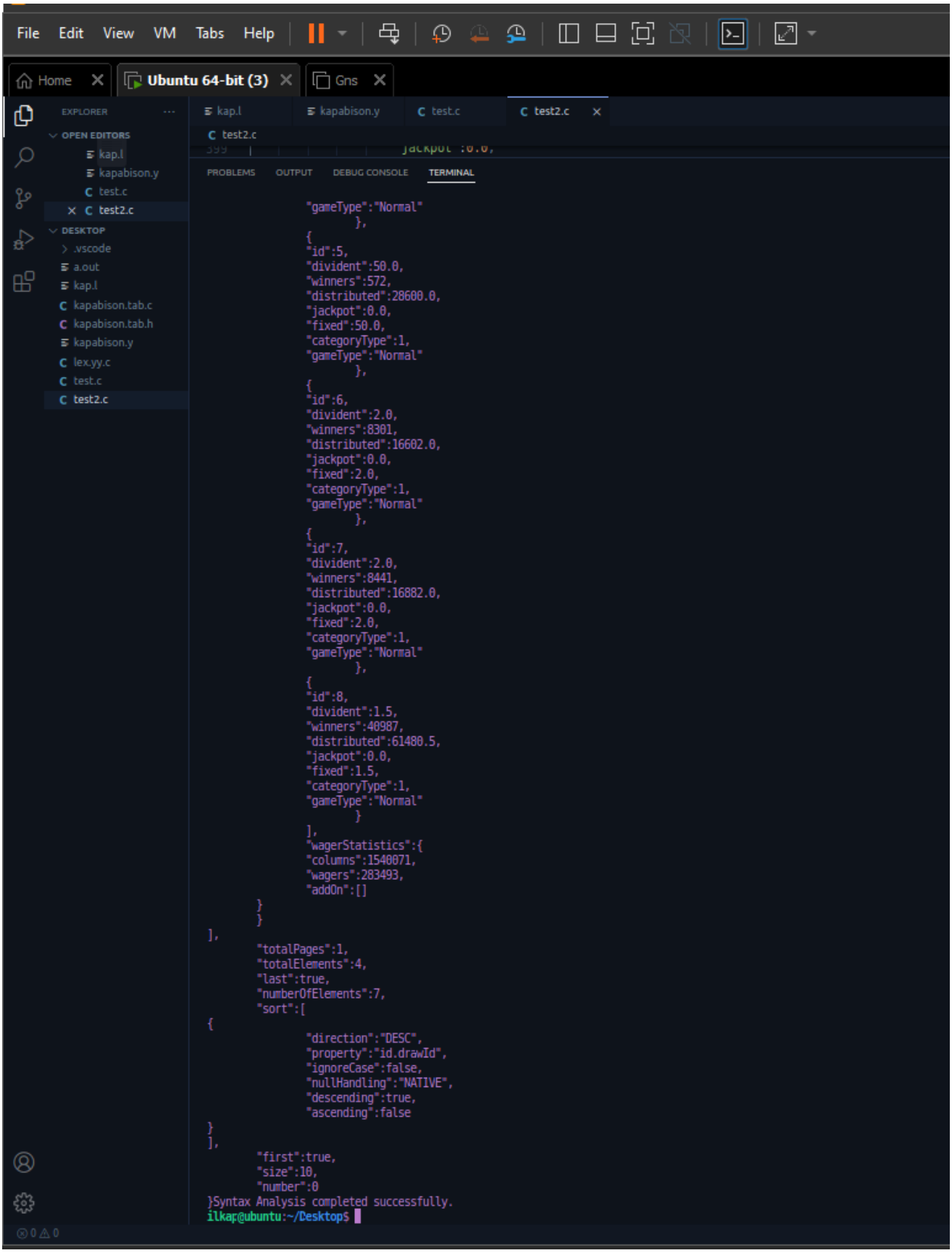

EXPLORER
OPEN EDITORS
kap.l
kapabison.y
test.c
test2.c
DESKTOP
.vscode
a.out
kap.l
kapabison.tab.c
kapabison.tab.h
kapabison.y
lex.yy.c
test.c
test2.c
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
"winners":803,
"distributed":40150.0,
"jackpot":0.0,
"fixed":50.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":6,
"divident":2.0,
"winners":11148,
"distributed":22296.0,
"jackpot":0.0,
"fixed":2.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":7,
"divident":2.0,
"winners":9917,
"distributed":19834.0,
"jackpot":0.0,
"fixed":2.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":8,
"divident":1.5,
"winners":46429,
"distributed":69643.5,
"jackpot":0.0,
"fixed":1.5,
"categoryType":1,
"gameType":"Normal"
}
],
"wagerStatistics":{
"columns":2033304,
"wagers":359687,
"addOn":[]
}
},
{
"gameId":5104,
"drawId":2413,
"drawTime":1647201600000,
"status":"results",
"drawBreak":1800000,
"visualDraw":2413,
"pricePoints":{
"amount":0.5
},
"winningNumbers": {
"list":[36,44,16,31,38],
"bonus": [8]
},
"prizeCategories": [
{
"id":1,
"divident":0.0,
"winners":0,
"distributed":354740.96,
"jackpot":734655.21,
"fixed":0.0,
"categoryType":0,
"gameType":"Normal",


Home
Ubuntu 64-bit (3)
Gns
EXPLORER
OPEN EDITORS
kap.l
kapabison.y
test.c
test2.c
DESKTOP
.vscode
a.out
kap.l
kapabison.tab.c
kapabison.tab.h
kapabison.y
lex.yy.c
test.c
test2.c
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
"categoryType":0,
"gameType":"Normal",
"minimumDistributed":0.0
},
{
"id":2,
"divident":0.0,
"winners":0,
"distributed":54849.51,
"jackpot":0.0,
"fixed":0.0,
"categoryType":0,
"gameType":"Normal"
},
{
"id":3,
"divident":2500.0,
"winners":17,
"distributed":42500.0,
"jackpot":0.0,
"fixed":2500.0,
"categoryType":1,
"gameType":"Normal"
}
{
"id":4,
"divident":50.0,
"winners":271,
"distributed":13550.0,
"jackpot":0.0,
"fixed":50.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":5,
"divident":50.0,
"winners":796,
"distributed":39800.0,
"jackpot":0.0,
"fixed":50.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":6,
"divident":2.0,
"winners":11150,
"distributed":22300.0,
"jackpot":0.0,
"fixed":2.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":7,
"divident":2.0,
"winners":12080,
"distributed":24160.0,
"jackpot":0.0,
"fixed":2.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":8,
"divident":1.5,
"winners":68804,
"distributed":103206.0,
To direct input to this VM, move the mouse pointer inside or press Ctrl+G.


Home
Ubuntu 64-bit (3)
Gns
EXPLORER
OPEN EDITORS
kap.l
kapabison.y
test.c
test2.c
DESKTOP
.vscode
a.out
kap.l
kapabison.tab.c
kapabison.tab.h
kapabison.y
lex.yy.c
test.c
test2.c
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
"divident":1.5,
"winners":68804,
"distributed":103206.0,
"jackpot":0.0,
"fixed":1.5,
"categoryType":1,
"gameType":"Normal"
}
],
"wagerStatistics":{
"columns":2849325,
"wagers":498453,
"addOn":[]
}
},
{
"gameId":5104,
"drawId":2412,
"drawTime":1646942400000,
"status":"results",
"drawBreak":1800000,
"visualDraw":2412,
"pricePoints":{
"amount":0.5
},
"winningNumbers": {
"list":[23,16,17,27,40],
"bonus": [16]
},
"prizeCategories":[
{
"id":1,
"divident":0.0,
"winners":0,
"distributed":230875.17,
"jackpot":519124.83,
"fixed":0.0,
"categoryType":0,
"gameType":"Normal",
"minimumDistributed":0.0
},
{
"id":2,
"divident":56795.63,
"winners":2,
"distributed":35697.57,
"jackpot":77893.7,
"fixed":0.0,
"categoryType":0,
"gameType":"Normal"
},
{
"id":3,
"divident":2500.0,
"winners":7,
"distributed":17500.0,
"jackpot":0.0,
"fixed":2500.0,
"categoryType":1,
"gameType":"Normal"
}
{
"id":4,
"divident":50.0,
"winners":191,
"distributed":9550.0,
"jackpot":0.0,
"fixed":50.0,

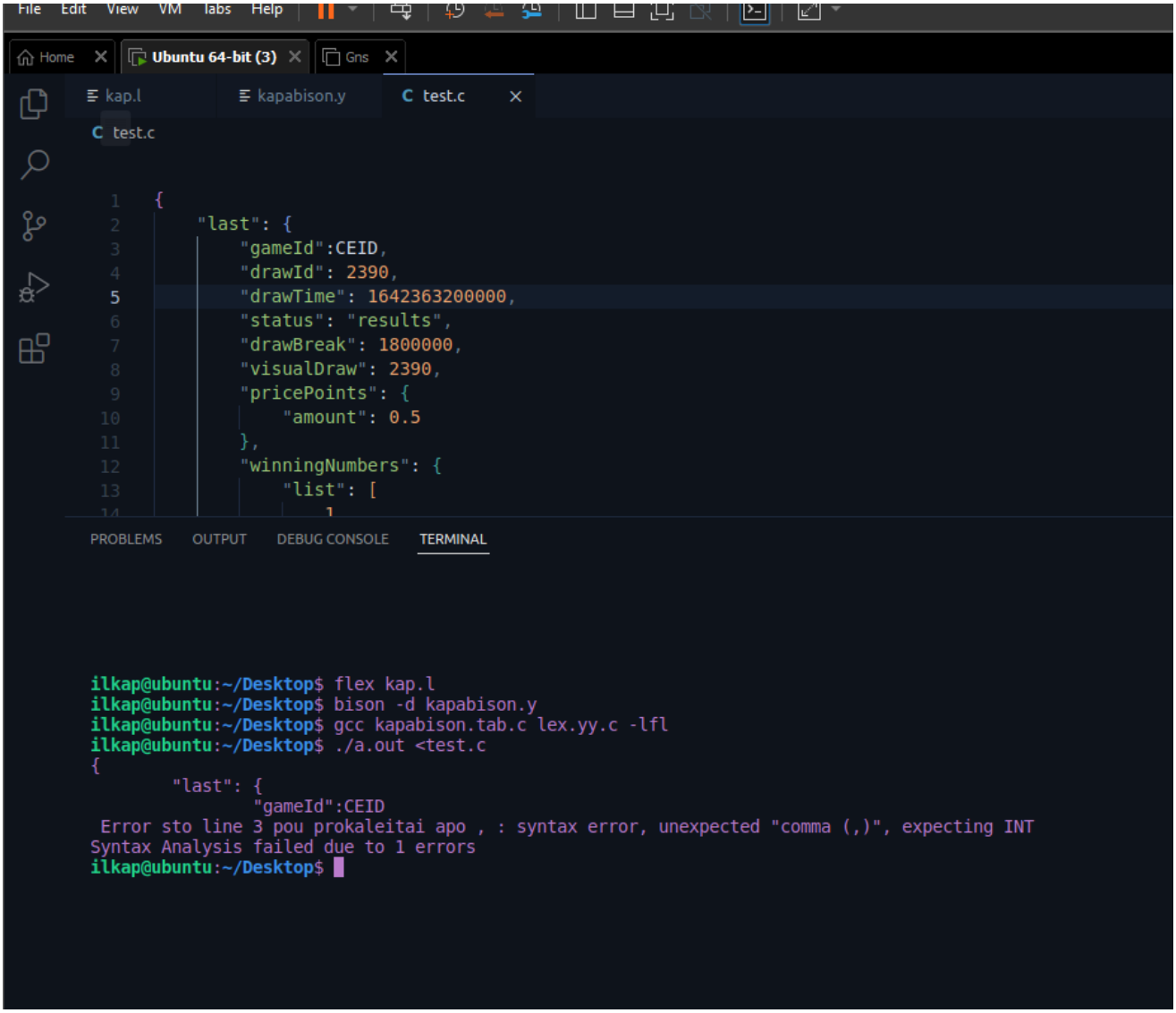

Home
Ubuntu 64-bit (3)
Gns
EXPLORER
OPEN EDITORS
kap.l
kapabison.y
test.c
test2.c
DESKTOP
.vscode
a.out
kap.l
kapabison.tab.c
kapabison.tab.h
kapabison.y
lex.yy.c
test.c
test2.c
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
"distributed":9550.0,
"jackpot":0.0,
"fixed":50.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":5,
"divident":50.0,
"winners":571,
"distributed":28550.0,
"jackpot":0.0,
"fixed":50.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":6,
"divident":2.0,
"winners":9782,
"distributed":19564.0,
"jackpot":0.0,
"fixed":2.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":7,
"divident":2.0,
"winners":7047,
"distributed":14094.0,
"jackpot":0.0,
"fixed":2.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":8,
"divident":1.5,
"winners":31989,
"distributed":47983.5,
"jackpot":0.0,
"fixed":1.5,
"categoryType":1,
"gameType":"Normal"
}
],
"wagerStatistics":{
"columns":1854419,
"wagers":338607,
"addOn":[]
}
},
{
"gameId":5104,
"drawId":2411,
"drawTime":1646769600000,
"status":"results",
"drawBreak":1800000,
"visualDraw":2411,
"pricePoints":{
"amount":0.5
},
"winningNumbers": {
"list":[16,2,3,14,39],
"bonus": [7]
},
"prizeCategories":[


Home
Ubuntu 64-bit (3)
Gns
EXPLORER
OPEN EDITORS
kap.l
kapabison.y
test.c
test2.c
DESKTOP
.vscode
a.out
kap.l
kapabison.tab.c
kapabison.tab.h
kapabison.y
lex.yy.c
test.c
test2.c
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
"status":"results",
"drawBreak":1800000,
"visualDraw":2411,
"pricePoints":{
"amount":0.5
},
"winningNumbers": {
"list":[16,2,3,14,39],
"bonus": [7]
},
"prizeCategories":[
{
"id":1,
"divident":0.0,
"winners":0,
"distributed":191738.84,
"jackpot":408261.16,
"fixed":0.0,
"categoryType":0,
"gameType":"Normal",
"minimumDistributed":0.0
},
{
"id":2,
"divident":0.0,
"winners":0,
"distributed":29646.37,
"jackpot":48247.33,
"fixed":0.0,
"categoryType":0,
"gameType":"Normal"
},
{
"id":3,
"divident":2500.0,
"winners":11,
"distributed":27500.0,
"jackpot":0.0,
"fixed":2500.0,
"categoryType":1,
"gameType":"Normal"
}
{
"id":4,
"divident":50.0,
"winners":202,
"distributed":10100.0,
"jackpot":0.0,
"fixed":50.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":5,
"divident":50.0,
"winners":572,
"distributed":28600.0,
"jackpot":0.0,
"fixed":50.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":6,
"divident":2.0,
"winners":8301,
"distributed":16602.0,
"jackpot":0.0,


File Edit View VM Tabs Help
Home
Ubuntu 64-bit (3)
Gns
EXPLORER
OPEN EDITORS
kap.l
kapabison.y
test.c
test2.c
DESKTOP
.vscode
a.out
kap.l
kapabison.tab.c
kapabison.tab.h
kapabison.y
lex.yy.c
test.c
test2.c
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
"gameType":"Normal"
},
{
"id":5,
"divident":50.0,
"winners":572,
"distributed":28600.0,
"jackpot":0.0,
"fixed":50.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":6,
"divident":2.0,
"winners":8301,
"distributed":16602.0,
"jackpot":0.0,
"fixed":2.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":7,
"divident":2.0,
"winners":8441,
"distributed":16882.0,
"jackpot":0.0,
"fixed":2.0,
"categoryType":1,
"gameType":"Normal"
},
{
"id":8,
"divident":1.5,
"winners":40987,
"distributed":61480.5,
"jackpot":0.0,
"fixed":1.5,
"categoryType":1,
"gameType":"Normal"
}
],
"wagerStatistics":{
"columns":1540071,
"wagers":283493,
"addOn":[]
}
}
],
"totalPages":1,
"totalElements":4,
"last":true,
"numberOfElements":7,
"sort":[
{
"direction":"DESC",
"property":"id.drawId",
"ignoreCase":false,
"nullHandling":"NATIVE",
"descending":true,
"ascending":false
}
],
"first":true,
"size":10,
"number":0
}Syntax Analysis completed successfully.
ilkay@ubuntu:~/Desktop$

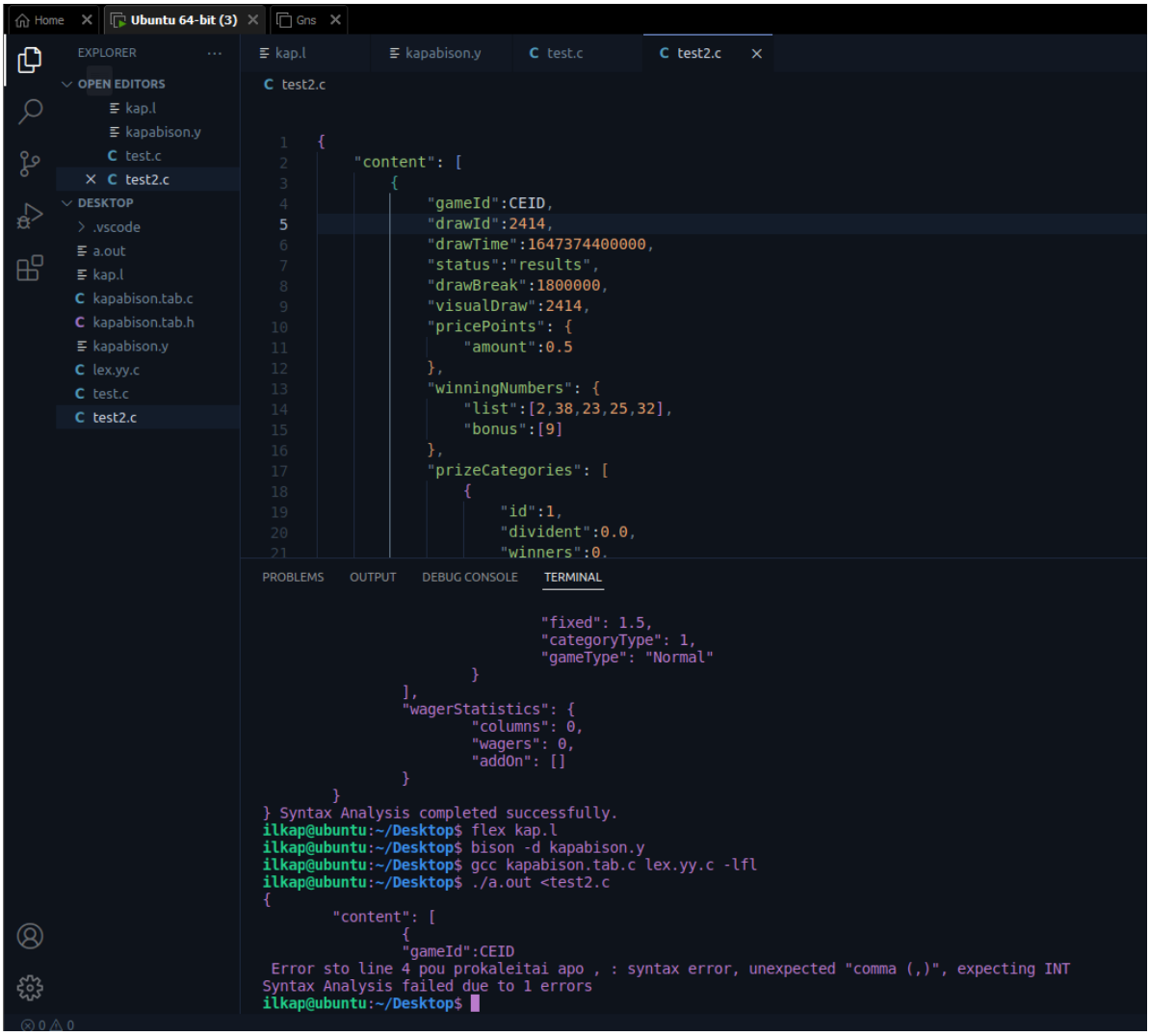
ERROR στο αρχειο last_result.

Κάνω αλλαγή στο gameId και αντί για μεταβλητή τύπου INT του δίνω STRING και ο συντακτικός αναλυτής μου εμφανίζει το παρακάτω error.



ERROR στο αρχειο range_result.

Κάνω αλλαγή στο gameId και αντί για μεταβλητή τύπου INT του δίνω STRING και ο συντακτικός αναλυτής μου εμφανίζει το παρακάτω error.



6.Εντολές εκτέλεσεις

flex όνομα_αρχείου_flex.l

bison -d όνομα_αρχείου_bison.y

gcc όνομα_αρχείου_bison.tab.c lex.yy.c -lfl

./a.out <όνομα_δοκιμαστικού_αρχείου.c

```
ilkap@ubuntu:~/Desktop$ flex kap.l
ilkap@ubuntu:~/Desktop$ bison -d kapabison.y
ilkap@ubuntu:~/Desktop$ gcc kapabison.tab.c lex.yy.c -lfl
ilkap@ubuntu:~/Desktop$ ./a.out <test.c
{
```