Programming Languages Test One Study Sheet

The test will cover chapters 1-5.

Basically understand the history of each language we have studied, its paradigm, any tradeoffs which it made, its strengths, purposes and weaknesses.

What is the difference between compiling and interpreting?

Be sure that you understand the pseudo code of chapter one and make sure you understand what it was illustrating.

On p. 16 be able to do the exercise 1-8 and 1-10.

Be able to explain the pseudo code on p. 20.

Look at exercise 1-40 on page 29.

What is the Read-execute cycle? What is its relationship to an interpreter? p. 37 questions 6 and 7

Understand in Chapter One the principles of Automation, Security, Orthogonality, Regularity and Labeling. I might ask you to illustrate how they are or are not followed by the pseudo code presented.

Know the History of FORTRAN. Who is responsible for it? When?

Be able to comment a little FORTRAN program like the one on p. 42.

What is binding? What are the tradeoffs?

What are the parts of the FORTRAN compiler? What is the relationship to this early compiler and Block Structure?

What are the stages that a program that is compiled goes through in order to be run? P. 63

Understand the relationship between Understand the relationship between FORTRAN control structures and the IBM 704 branch statement. Be able to discuss intelligently the effects of this on later languages.

What does this mean? "In FORTRAN the GOTO is the workhorse of Control Flow?"

What is the difference between Pass by Reference and Pass by Value-Result in FORTRAN? P. 60 Exercise 2.15

P. 60 tasks to be completed to perform a subprogram invocation.

How are FORTRAN Arithmetic Operations overloaded?

SKIP pp73-75
p. 77 Automatic declaration of variables. How is this a problem?

What is a FORTRAN COMMON block?

What is aliasing and why is it dangerous?
Know the characteristics of First Generation Languages.

ALGOL

Know the history of ALGOL

Be able to discuss the relationship between Formal Grammars and ALGOL.

What is a BNF, what is the relationship between a BNF and ALGOL?

Be able to discuss the Structural Organization of ALGOL and how it differed from FORTRAN.

What were the three levels of ALGOL? Why was this Good? Why bad?

p.105 Exercise 3.2

What is a block?

What is Scope?

P.P. 107-110 What is the difference between dynamic and static scoping? What P. 107-110 What is the difference between called in the environment of the caller or called in the environment of the definition?

p. 112 question 3-10 Static and Dynamic Scoping

In ALGOL understand the difference between pass by name and pass by value.

What is an ALGOL Switch? How have newer languages dealt with the problem which the switch was designed to handle? Be specific.

What is the relationship between block-structure and nesting?

Understand the ALGOL control structures and nesting.

p. 140-141 #s 4, 6,10.

What is an ALGOL switch statement?

p. 152 exercises 4.5,4.6,4.7

pp 161-165

p. 174 # 8, # 11.

What are the objectives of ALGOL as stated in the "58 Report"?

What is the difference between the compilation process for FORTRAN and ALGOL? What is the difference to do with binding time?

How do name structure functions work in ALGOL? How is that different? What is the goal of name structures?

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Why do you suppose most later languages are statically scoped?

What control structure does the concept of block simplify?

Discuss Discuss the significance of the Zero,One,Infinity Principle in programming language design. Give an example of how it is used in the design of ALGOL.
Give 2 reasons for Algol's failure. If ALGOL truly failed what is its significance in the history of programming languages?

Pascal

What were the two goals of Pascal?

Pascal extends the primitive data types to include enumeration types. What problem did this overcome and what software engineering principle did it support?

What are the two explicit design goals of Pascal?

Understand Pascal's SET type.

Be able to discuss Wirth's design decisions for Pascal and the impact that they had for Arrays.

What is a Pascal Record?

What is a Case Statement?

Be able to reproduce Pascal primitive data types in the tree form which I gave in class.

p. 191 Pascal's arrays. What further problem did this lead to?

p. 205 What are the six name binding mechanisms in Pascal.

Understand parameter passing in Pascal and how it differs from ALGOL.

What are the characteristics of third generation programming languages?

What is an activation record and what is its role in a programming language?

P. 179 Exercise 5.7

How is the Pascal For Loop different from the same structure in ALGOL and FORTRAN?

What is the security risk involved in using Variant Arrays? P. 186-187

What advantages did Wirth gain in writing a Pascal compiler in Pascal? Did he succeed in his efforts: Where does Pascal fall short? What gains did it make over ALGOL? How might it have been different if it had not been preceded by ALGOL?

Did Pascal live up to its designer's goals?

Understand the characteristics of Third-Generation Languages.