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Data types and Control structures in C++

Faculty Information

Learning Objectives

After completing this activity, learners should be able to:

- Understand what are data types & various data types in OOP with their usage.
- How to construct CPP program from C syntax (learn some CPP utilities)
- Learn control structures and their suitable applications
- Assess the performance of programs with combination of various data types and control structures

Prerequisites

Before starting this activity, learners are need to aware about CPP-Programming.

Preparation

Optional: Provide the worksheet on the board, a poster, or in presentation software, so teams can see each other's' work easily.

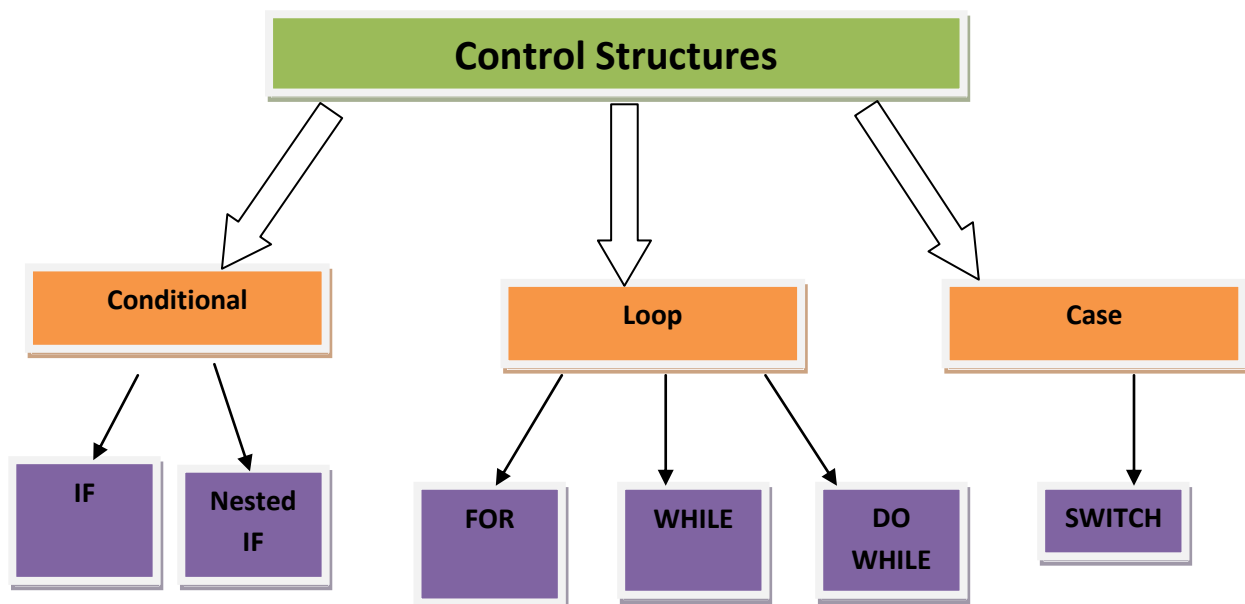
Activity History

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Data types and Control structures in C++

Introduction

- A programming language is designed to help process certain kinds of data consisting of variables, constants (Distinguish by its data type) provide useful output called information.
- The task of processing of such data is accomplished by executing a program.
- Program is a set of statements which are normally executed sequentially in a written order.
 - This happens when no repetitions of certain calculations are necessary.
- Control structures allow us to change the ordering of how the statements in our programs are executed.
- The taxonomy of Control structures is below.



Data types and Control structures in C++

Before you start, complete the form below to assign a role to each member.

Team		Date	
Team Roles		Team Member (Write your Roll-number)	
Recorder: records all answers & questions, and provides copies to team & faculty.			
Speaker: talks to faculty and other teams.			
Manager: keeps track of time and makes sure everyone contributes appropriately.			
Other:			

Reminders:

- 1. Note the time whenever your team starts a new section or question.*
- 2. Write legibly & neatly so that everyone can read & understand your responses.*

Data types and Control structures in C++

I. (10 min) Subtask-1

1. Group the items shown in the picture (show different groups by drawing circles/Rectangles/etc...)



2. Name each group (from I.1) and justify?

3. Associate the groups with keywords. Mention some more groups with their keywords and example data for each group (identify from resources).

4. It is observed that two groups are having subset, superset relationship.
Explain the relation.

Data types and Control structures in C++

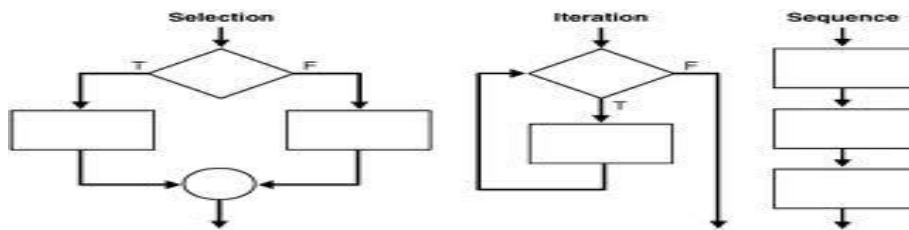
II. (15 min) Subtask-2

1. Observe the below table carefully, write C++ code equivalent to C code in left hand side.

	C	C++
1	Void main ()	
2	{	
3	inta,b,c;	
4	Printf(“enter any two numbers”);	
5	Scanf(“%d%d”,&a,&b);	
6	C=a+b;	
7	Printf(‘result is %d’,c);	
8	}	

2. Write in detail steps in writing a program, compiling, executing and testing with Turbo-C. (Use above example).

III. (15 min) Subtask-3



1. Define control structure? Mention the motivation behind using control structures in programming. (Use pictures above)

2. Develop C++ programs for the above control structures with suitable examples. Also justify why they are suitable?

IV. (15 min) Quiz Subtask-4



1. Which header file we use in C++ that defines “cin” and “cout”.
2. For what purpose “//” type of lines are used in C++ programming.
3. All C programs can be saved with “.c” extension what is the extension in the case of C++.
4. What is private and public in programming?
5. What is the difference between class and structure

V. Home assignment

Electricity is vitally important in our daily lives and used by different type of people. The consumption of electricity varies across users. The billing also varies based on the consumption slabs. Design a model to calculate the billing dues by different types of customers (By flow chart) by performing the requirement analysis. Develop the program using C and C++ for the designed model and test the program in both the languages. Write a detailed notes by comparing the both the programming languages. their differences and advantages of C++.

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Resources

Text Book

- [1] R. Lafore, Object-Oriented Programming in C++, 4 ed.: sams publishers
- [2] Data Structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education , second edition

.

References

- [3]Robert L.Kruse, Leung and Tando, 'Data Structures and Program Design in C', PHI
- [4] Data structures using C and C++, Langsam, Augenstein and Tanenbaum,PHI/Pearson Education
- [5]Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and D.Mount, Wiley

Web resources

- [6](P. P. Chakraborty. 20 January). Lecture Series on Programming and Data Structure NPTEL. Available: <http://nptel.iitm.ac.in/video.php?courseId=1125>
- [7]P. R. C. Holte and 20 January). Data Structures Webdocs. Available: <http://webdocs.cs.ualberta.ca/~holte/T26/top.realTop.html>
- [8]S. Skiena. (1996, 21-1-2011). Data Structures Computer Based LearningUnitUniversity of Leeds. Available: <http://www.cs.sunysb.edu/~skiena/214/lectures/>
- [9]P. Hilfinger. 18 January). Data Structures Academic earth. Available<http://academicearth.org/courses/data-structures>

Name &Signature of the Student

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Evaluation of the Task: Rubric

SPECIFIC CRITERIA	RATIN G	COMMENTS
I: Understand what is data type and control structures	/ 4	
II: Comprehensively synthesizes application of all control structures & data types with suitable examples only.	/ 4	
III: Performance in Quiz	/ 3	
IV: Performance in Home assignment	/ 3	
COMMON CRITERIA	RATIN G	COMMENTS
Team member roles and time management.	/ 2	
Neatness of the work, Organization and clarity in providing all required information.	/ 4	
TOTAL	/ 20	

Name & Signature of the Faculty