**CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY**

Chandubhai S. Patel Institute of Technology [CSPIT]

# Computer Science & Engineering

**Subject Code and Name: CE143 Computer Concepts and Programming**

**Semester: I**

**Academic year: 2022-2023**

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| **No.** | **Aim of the Practical** |
| **Set – 1** | |
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| **ID NO:22TCE052,22CE055** | |

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|  | 1 |
| 1.1 | **Write a C program that will output this passage by Michael Singer. Make sure your**  **output looks exactly as shown here (including spacing, line breaks, punctuation, and the title and author). Use Required Escape Sequence and ASCII Value.** |
| code |  |
| outcome |  |
| **Algorithm** | **Step-1:Start**  **Step-2:Print given data by using ASCII values and escape sequences**  **Step-3:Stop** |
| **flowchart** | **stop**  Print given data by using ASCII values and escape sequences  **start** |

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|  | **Question – Answer**   1. **Have you learnt about ASCII values for different symbols other than smile, diamond and heart? If yes, then mention any 5 ASCII symbols and their values in tabular format.**  |  |  |  | | --- | --- | --- | | sr.no | ASCII | SYMBOLS | | **1** | 001 | ☺ | | **2** | 016 | ⮚ | | **3** | 017 | ⮘ | | **4** | 019 | !! | | **5** | 037 | % | |
| **1.2** | **Write your bio-data using Escape Sequences. And you have to take your Basic Information as user input. It should contain the following content. It should contain the following content.**  **Expected Outcome:**  **Draw flowchart, write Algorithm and program for given scenario. Also attach screenshot of output.** |
| **Code** |  |

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| **outcome** | |  |
| **Algorithm** | | **Step-1:Start**  **Step-2:Print bio-data by using escape sequences**  **Step-3:stop** |
| Flowchart | | Screenshot (26) |
|  | | Questions:  1. What is the purpose of using escape sequences? Answer in one or two  statements. Mention any 5 escape sequences used regularly along  with their purpose.  Screenshot (28) |
|  | **2** | |
| 2.1 | **In a town, the percentage of men is 52. The percentage of total literacy is 48. If total percentage of literate men is 35 of the total population, write a program to find the total number of illiterate men and women if the population of the town is 80,000.** | |
| **code** |  | |
| outcome |  | |
| **Algorihm** |  | |
| **Flowchart** |  | |
|  | **Questions**  **1. Has this scenario helped you learned about integer and float data type ? If yes,then mention the requirement of using integer and float data**  **types.**  Answer 1:yes, This scenario helped me learn about integer and float datatypes. we can use  integer for integer value and float for  decimal value. | |
| **2.2** | **A Bigbazaar cashier has currency notes of denominations 10,50 and 100. If the amount to be withdrawn is input through the keyboard in hundreds, find the total number of currency notes of each denomination the cashier will have to give to the withdrawer.** | |
| **Code** |  | |
| **Outcome** |  | |
| **Algorithm** |  | |
| **Flowchart** |  | |

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|  | **Questions: 1. Have you learned about how scanf function can be used to collect the user input? Give the correct answer for the following table:** |
| 2.3 | **Write a program to calculate Net Salary. User has to input Basic Salary and Output should be: Enter Basic Salary: 5000 (e.g. 5000) Allowances: DA = 70% of Basic Salary HRA = 7% of Basic Salary MA = 2% of Basic Salary TA = 4% of Basic Salary Deduction: PF = 12% of Basic Salary IT = any value (e.g. 500)** |
| **Code** |  |
| **Outcome** |  |
| **Algorithm** |  |
| **Flowchart** |  |
|  | **Questions:**  **1. Have you learned about various data types that can be suitably used**  **for this problem? Do mention which data types can be used and why?**  **Also mention the difference between the outputs.**  **Ans:** Yes ,I use long data type because it contain large range of integer. |
|  | **3** |
| **3.1** | Write a program that takes the length of the pendulum as input and then  calculate the time period of the pendulum. Provided that, T=2π√L/G.  Define the value of π as 3.14 and take L as the length of the pendulum and  G as the acceleration of gravity either in m/s or as input from the keyboard.  Display the time period rounded to 2 decimal places. |
| **Code** | IMG_256 |
| **Outcome** |  |
| **Result**  **Table** |  |
| **Algorithm** |  |
| **Flowchart** |  |

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|  | **Question – Answers**   1. **Have you learned about, how math function is useful for calculating square root? Which datatype is supported by all math functions? Also mention any 5 math functions with their purpose.**  |  |  |  | | --- | --- | --- | | Sr no | Math function | Description | | 1 | pow | Returns the power of given number. | | 2 | abs | Return the absolute value of given number | | 3 | Ceil | Returns the integer value which is greater than or equal to given number | | 4 | Floor | Returns the integer value which is less than or equal to given number. | | 5 | log | Returns the natural logarithm (base-e logarithm) of given number. |   Ans. Float datatype is supported by all math functions |
| **3.2**  [a] | Let us understand the working of Pre-increment, Post-increment, Pre  decrement and Post-decrement  **Consider a scenario where, Boys are playing in the park and**  **collecting and removing the yellow balls in/from the bucket based on**  **teacher’s instruction. Let’s say there are already 10 Yellow balls present in a bucket. Following is the sequence of the instructions given by the teacher for**  adding/removing the balls.  i.Rajiv: ++ Yellow  ii.Preet: --Yellow  iii.Raj: Yellow++  iv.Ritul: Yellow-- |
| **Code** |  |
| Outcome |  |
| Algorithm | Step 1: Start.  Step 2: y = 10.  Step 3: y = ++y and print Rajiv’s count = y.  Step 4: y = --y and print Preet’s count = y.  Step 5: a = y++ and print Raj’s count = a.  Step 6: b = y—and print Ritul’s count = b.  Step 7: End. |
| Flowchart |  |

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| [b] | **Consider another scenario where boys and girls both are asked to**  **add/remove Yellow and Pink balls from the bucket respectively.**  **Currently there are 10 Yellow balls in the bucket and 20 Pink balls.**  **Teacher has given the sequence of instructions as below for**  **adding/removing the balls.**  Calculate = ++Yellow + Yellow++ + --Yellow + ++Pink - --Pink - --  Pink  Get the count of Yellow and Pink balls after evaluating above given  scenario. |
| **Code** |  |
| Outcome |  |
| Algorithm | Step 1: Start.  Step 2: yellow = 10.  Step 3: yellow = ++ yellow and print Rajiv’s count = y.  Step 4: yellow = -- yellow and print Preet’s count = y.  Step 5: a = yellow++ and print Raj’s count = a.  Step 6: b = yellow—and print Ritul’s count = b.  Step 7: End. |

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| Flowchart |  |
|  | **Question – Answers**    **Have you understood the working of Pre-increment, Post-increment, Pre-decrement and Post-decrement?**    Ans:- Yes through this practical I understood the working of Pre-increment, Postincrement, Pre-decrement and Post-decrement. |
| 3.3 | **Write a C program to swap two numbers (use two variables for collecting**  **value from user) without using third variable. (Hint: Use arithmetic**  **operators)** |
| Code |  |
| Outcome |  |
| Algorithm | Step 1: Start.  Step 2: Input the value of a, b.  Step 3: Value of a before swapping = a  Value of b before swapping = b  Step 4: a = a+b  Step 5: b = a-b  Step 6: a = a-b  Step 7:Value of a after swapping = a  Value of b after swapping = b  Step 8: End. |

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| Flowchart |  |
|  | **Question – Answers**  **1. Have you learned about, how we can use arithmetic operators for swapping the numbers?**  Ans. Yes we can use arithmetic operators such as addition, subtraction for swapping of two numbers. |

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|  | 4 |
| 4.1 [a] | Write something about your characteristics not more than 50 words  using gets function and print out the same using puts function. |
| Code |  |
| Outcome |  |
| **Algorithm** | Step-1:Start  Start-2:Describe data[50]  Step-3:Enter characteristics  Step-4:Print characteristics  Step-5:Stop |
| **Flowchart** |  |
|  | **Questions:**  **1. What is the significance of using gets and puts? Are they acting as replacement of any function? How?**    The use of gets and puts is to print the function in c and to ask value from user in c respectively. Here they are acting as replacement of function printf and scanf in c programming. Where printf is used at that place the puts function is used to print the line in c and similarly to ask the value instead of scanf the function gets is used,. |
| [b] | Write a program to convert the decimal number into octal and  hexadecimal format. Print hexadecimal and octal values for given  inputs in expected outcomes. |
| Code |  |
| Outccome |  |
| Algorithm | Step 1:start  Step 2:Declare num  Step 3:Get num from user  Step 4:Print hexadecimal of num usung %x  Step 5:Print octal of num using %o  Step 6:End |
| Flowchart | 4.1.B (2) |
| 4.2 | **Write a C Program to Print multiplication table from 1 to 7 to achieve the**  **following output. (Use #define directives and do while loop)** |
| **Code** |  |
| **Outcome** |  |
| **Algorithm** | Step 1:Start  Step 2:Define cmax=7,ramx=10;  Step 3:Declare i=1,j=1  Step 4: j\*I,j+1  Step 5:If <=cmax,goto step 4  Step 6:I+1  Step 7:If <=rmax,goto step 6  Step 8:End |
| **Flowchart** | 4.2 |

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|  | 5 |
| 5.1 | Write a C program for the given scenario from the flowchart. Note that you  have to enter your own height in centimeters. |
| Code |  |
| **Outcome** |  |
|  |  |
| Algorithm | Step 1:Start  Step 2:Declare height  Step 3:Take height from user  Step 4:If height <150 then  Print the person is dwarf  End if  Step 5: Else if height>=150 and height <165 then  Print the person has average height  End else if  Step 6:Else if height>=165 and height <195 then  Print the person is tall  Else print the person has abnormal height  End else if  Step 7:End |
| Flowchart | 5.1 |
| 5.2 | Write a C program to find all roots of a Quadratic equation using nested  switch case. Take three user inputs from keyboard for finding the  discriminant (b2 – 4ac). Use the concept of nested switch case for finding the  roots of equation. Get the outputs for roots till 2 decimal points only.  Hint:  Discriminant > 0  root1 = (-b + sqrt(discriminant)) / (2\*a)  root2 = (-b - sqrt(discriminant)) / (2\*a)  Discriminant < 0  root1 = root2 = -b / (2\*a)  imaginary = sqrt (-discriminant) / (2\*a) (eg. Print it as: i20.3, i.e. i followed  by value)  Discriminant = 0  root1 = root2 = -b / (2\*a) | | | |
| Code |  | | | |
| Outcome |  | | | |
| Algorithm | Step-1:Start  Step-2:Take a,b,c,root1,root2.  Step-3:docs=(b\*b)-(4\*a\*c)  Step-4:if dics>0.root1=(-b +sqrt(disc))/(2\*a),root2=(-b -sqrt(disc))/(2\*a)  Step-5:if disk<0 root1=root2=-b/(2\*a)  Step-6:root1=root2=-b(2\*a)  Step-7:Print root1,root2.  Step-8:End | | | |
| Flowchart | 5.2 | | | |
|  | **Questions:**  **1. Have you learned about how to use normal switch case and nested**  **switch case?.** yes I learned about all type of switch case.   1. **Is default case necessary for every switch case?**.NO   **3. What if break statement is not mentioned between two consecutive**  **cases?.**if break statement is not mentioned between two case then second case consider in first case. | | | |
| 5.3 | If the ages of Ram, Shyam and Ajay are input through the keyboard, write a  program to determine the youngest of the three. If all of them are of same  age then print that “All are of same age”. (Hint: Use Nested if else statement) | | | |
| Code | IMG_256 | | | |
| Outcome |  | | | |
|  |  | | | | |
| Flowchart | 5.3 | | | | |
| Algorithm | Step-1:Start  Step-2:Take collect the ages of ram,shyam,ajay  Step-3:If ram==shyam==ajay,print all arex of equal ages else goto step 4  Step-4:If ram==shyam!=ajay,print ram and shyam are equal else goto step 5  Step-5:If ram==shyam!=ajay,print shyam and ajay are equal elese goto step 6  Step-6:If ram==ajay!=shyam,print ram and ajay are equal else goto step 7  Step-7:If ram<ajay and ram<shyam print ram is younger else goto step8  Step-8:Ifshyam<ram and shyam<ajay print shyam is younger else goto step 9  Steo-9:print ajay is younger  Step-10:End | | | | |
|  | **Questions:**  **1. Have you tried merging the concepts of Nested if else and else if**  **ladder in this scenario?.**yes we use nested if else in this scenario.  **2.Differentiate the concept of Nested if else and else if ladder**  The nested if is **an if statement used within another if statement**. When we use if else if then an if statement is used within the else part of another if in this way,'nested if is similar to an if else if statement.  **A common programming construct that is based upon nested ifs** is the if-else-if ladder. It looks like this. The conditional expressions are evaluated from the top downward. As soon as a true condition is found, the statement associated with it is executed, and the rest of the ladder is bypassed. | | | | |
| 5.4 | The policy followed by a company to process customer orders is given by  the following rules: Suppose stock=100  a. If a customer order is less than or equal to that in stock and ‘has credit’  is OK, supply ‘has requirements.  b. If ‘has credit’ is not OK do not supply. Send him intimation.  c. If ‘has credit’ is OK but the item in stock is less than ‘has ordered’,  inform ‘out of stock’ and intimate him that the balance will be refunded.  Write a C program to implement the company policy. | | | | |
| Code |  | | |
| Outcome |  | | |
| Algorithm | Step-1:Start  Step-2:TAKE score=100,credit  Step-3:If credit is ok then type Y else no  Step-4:if order<=stock && credit == 'y' || credit == 'Y' print Print We supplied your requirement  Else goto step 5.  Step-5:if order>stock && credit == 'y' || credit == 'Y' Print We supplied stock products and balance will be shipped later else goto step 6.  Step-6:Print Please first clear your credit, until we can't supply you any more  Step-7: End | | |
|  | **Questions:**  **1. Which kind of logic have you used for building this program? If else**  **if ladder or nested if else statements?**  The if/else statement executes a block of code if a specified condition is true.  It is always legal in C programming to nest if-else statements, which means you can use one if or else if statement inside another if or else if statement(s). | | |
| Flowchart | 5.4 | |

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|  | 6 |
| 6.1 | There is a person, who is asked to enter the alphanumeric password for  registering into an ecommerce website for purchasing products from website.  But he is not aware about, what does Alphanumeric mean. So, he tries  entering various combinations 5 times, but he fails to create such password.  So let us help him by writing a C program to validate his password.  Constraints for writing password are it should have combination of  lowercase, uppercase and digit.  Note: Use Do while loop, and give print appropriate outputs on incorrect  validations. |
| Code |  |
| Outcome |  |
| Flowchart | 6.1 |
| Algorithm | Step-1:Start  Step-2:Char pass[100];int i, alpha = 0, upper = 0,lower = 0, digit = 0  Step-3:If i <= strlen(pass), i is <= pass length goto Step-4 else goto Step  Step-4:isdigit(pass[i]) check if character is digit then digit=1 and goto Step 5  Step-5:isalpha(pass[i]) check if character is alphabet gotoStep-6  Else I++  Step-6;isupper(pass[i]) check if character is in uppercase then true  Else islower(pass[i]) check if character is in lowercase  Step-7:alpha check if pass contains alphabet then print valid password else gotstep8  Step-8:lower check if pass contains lowercase then print valid password goto step9  Step-9:digit check if pass contains digit then print valid password goto  Step-10:if one of digit, alpha, upper, lower is 0 tren print valid password  Step-11:End |
|  | **Questions:**  **1. Have you understood working of do...while loop? Do mention the**  **syntax of this loop.**->Yes,Do{  Statement;  }while(condition)  **2. Have you used for loop in this program?**>Yes  **3. What is goto statement? How is it useful?**  The goto statement can be used to alter the flow of control in a program. Although the goto statement can be used to create loops with finite repetition times, use of other loop structures such as for, while, and do while is recommended. The use of the goto statement requires a label to be defined in the program. |
| 6.2 | **Two numbers are entered through the keyboard. Write a program to find the**  **value of one number raised to the power of another. (Use While loop)** |
| Code |  |
| Outcome |  |
| Flowchart | 6.2 |
| Algorithm | Step-1:Start  Step-2:Take x and y from users  Step-3:If i<=y then goto step -4 else goto step-5  Step-4:answer=answer\*x, i++  Step-5:Print x^y  Step-6:End |
|  | **Questions:**  **1. Have you understood the concept of while loop? if yes write its syntax**  **here**.  ->yes,while(condition){  Statement;  } |
| 6.3 | **Write a C program for Big bazaar cashier to count the amount to be collected**  **from the customer. Cashier will enter the numbers one after another for each**  **item and to get the summation of entered numbers, he has to enter 0.**  **(Use for loop) (Hint: Break statement can be used**) |
|  |  |
| Outcome |  |
| Flowchart | 6.3 (2) |
| Algorithm | Step-1:Start  Step-2:Declare total,price,I  Step-3:Take price from users  Step-4:If price=0 then goto step6 else goto step 5  Step-5:Total = total+price  Step-6:Print Total  Step-7:End |
|  | **Questions:**  **1. Have you learned the concept of for loop using above given scenario?**  **Explain what does ‘i’ stands for in the for() loop, consider the given**  **example below.**  **eg. for(i=0;i<10;i++)**  **->**yes,Here I show, for how much time the lloop going to be execute  It means your loop start from 0 Goes till it is still less than 10 i.e upto 9. And increases by a step of 1. That is it will go from 0 to 9 i.e the loop runs 10 times. |
| 6.4 | **Write a program for a match-stick game between the computer and a user.**  **Your Program should ensure that the computer always wins. Rules for the**  **games are as follows:**  **• There are 21 match-sticks.**  **• The computer asks the player to pick 1, 2, 3, or 4 match-sticks.**  **• After the person picks, the computer does its picking.**  **• Whoever is forced to pick up the last match-stick loses the game.**  **Use while loop, break and Continue Statements.** |
| Code |  |
| Outcome |  |
| Flowchart | 6.4 |
| Algorithm | Step-1:Start  Step-2:Declare MS=21,user,computer  Step-3:Take mathes from user  Step-4:If user<1 || user>4 then goto step 3 else goto step 5  Step-5:computer=5-user,MS=MS-computer-user  Step-6:If MS=1 then goto step 7 else goto step 3  Step-7:print you are lose from computer  Step-8:End |
|  | **Questions:**   1. **What is the significance of using break and continue statement?**   **->**The break statement terminates a while or for loop completely. The continue statement terminates execution of the statements within a while or for loop and continues the loop in the next iteration. |