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| Program 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)  **Expected Output:**  Draw flowchart, write algorithm and program for given scenario. Also attach  screenshot of output.  Input values in the console as per the table given below and write the results in  the table, based on received output. |
| Algorithm: | **Step1**:start  **Step2**:read the coefficient of the equation a,b,c.  **Step3**:calculate D=b\*b-(4\*a\*c)./  **Step4**:if D >0.  Calculate Root1=(-b+sqrt(b\*b-4\*a\*c))/2\*a.  Root2==(-b-sqrt(b\*b-4\*a\*c))/2\*a.  Display roots are real and different.  Display Root1 and Root2.  **Step5**:else if D=0.  Calculate root 1=-b/2\*a.  Root1=Root2.  Display root are real and equal.  Display root1 and root2.  **Step6**:else  Calculate root=-b/2\*a.  Calculate imaginary root =sqrt(-D/2\*a).  Display root are imaginary.  Display real +or -imaginary”i”.  **Step7**:End. |

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| Flowchart: | D=0 r1=r2  Print r1=r2 and r3  D<0  Print r1 and r2  D>0  D=-b+(b\*b-4\*a\*c)/2\*a  Enter the value of a,b,c  Declare a,b,c,D,root1,root2,imaginary |
| Code: |  |
| Output: |  |
| Question  Answer? | 1. Have you learned about how to use normal switch case and nested switch case?  **Answer**: Switch case statement evaluates a given expression and based on the  evaluated  value(matching a certain condition), it executes the statements associated with it.  Basically, it is used to perform different actions based on different  conditions(cases).  Nested-Switch statements refers to Switch statements inside of another Switch  Statements.  2. default case necessary for every switch case?  **Answer**: No it is not necessary of default case in a switch statement and there is no  rule of keeping  default case at the end of all cases it can be placed at the starting andd middle of all  other cases.  3. What if break statement is not mentioned between two consecutive cases?  **Answer**: If we do not use break statement at the end of each case, program will  execute all  consecutive case statements until it finds next break statement or till the end of  switch case  block |