

# Computer Program in C Language for Calculation of the Runoff through Different Runoff Computation Methods

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**Abstract** – The initial source of water to Runoff procreation over the surface of land is rainfall. It is necessary in today's world that to prevent and save the water on land surface. It is interception to prevent the water. There are many ways to prevent and save the water for future use. These spaces where the water from rainfall is stored works as the resources of water. The resource helps to save that water and use it for another better use. There are many methods and operations for measuring or finding estimate of runoff from a water source. For structure the farm pond and safe disposal or spillway runoff and its components are very useful. There are many methods and operations for measuring or finding estimate of runoff from a water source. Much time it make very complex and difficult to store records accurately. There are many methods to computation of runoff such as, rational,  $\phi$  index infiltration method, regression formulae, etc. This paper is to make simple the measurements using the C language with the project is entitled. The paper introduces with the methodology which might use to measure the morphological features of the watershed by using C language.

The C language is mainly used for programming. The Runoff computation methods like, Rational,  $\phi$  index infiltration,  $\omega$  index infiltration, Runoff coefficient, Inglis formula, khosala's method, Regression formula, Dickn's formula, Ryve's formula, Mayer's formula, Countage formula, Ali Nawaj Jang Bahadur formula were correctly calculated. But that procedure was takes place manually so it was very time consuming process. In this paper we are creating the software by using C language for calculate such methods. And make calculation speedy. Therefore, the software was found to be very vital beneficial for measuring the Runoff Method of the Watershed.

**Keywords** – Runoff, Procreation, Morphological, Watershed, Spillway etc.

## I. INTRODUCTION

The initial source of water to runoff procreation over the surface of land is rainfall.

Rainfall is precluded by buildings, plantations and the other components over the land.

It is necessary in today's world that to prevent and save the water on land surface. It is interception to prevent the water. There are many ways to prevent and save the water for future use. These spaces where the water from rainfall is stored works as the resources of water. The resource helps to save that water and use it for another better use. Hence the runoff is the part of rainfall or other source that goes to the rivers or oceans etc.

There are many methods and operations for measuring or finding estimate of runoff from a water source. Due to small scale watersheds the runoff approximation is much

necessary. For structure the farm pond and safe disposal or spillway runoff and its components are very useful. To measure the yield of watershed water the runoff approximation is necessary. There are many methods to computation of runoff such as, rational,  $\phi$  index infiltration method, regression formulae, etc. This paper is to make simple the measurements using the C language with the project is entitled. There are used different calculating methods of runoff by focusing on the objectives below:

1. To get familiar with software turbo C++
2. To make simple calculations to determine runoff using various methods using C language.
3. To decrease the time period that taken manually for defining or calculating the runoff with watershed.

## II. MATERIALS AND METHODS

The paper introduces with the methodology which might use to measure the morphological features of the watershed by using C language. The C language is mainly used for programming. It makes very easy calculations by making the programs or software in it. Therefore I used the various formulae and methods to fulfill the purpose. C language has some configurations and conditions in a system for perform such operations.

### ➤ Configuration of the System

- ✓ Windows 7 Ultimate or other versions. Processor: Intel (R) Core (TM) i3-3110M CPU @ 2.40 GHz. memory (RAM): 4.00 GB (3.39 GB usable).
- ✓ System Info: 32/64 – bit Operating system. Microsoft® Access 2007

### ➤ About the platform

- 1) Turbo C++ Version 3.0

## III. METHODS FOR RUNOFF MEASURING

Various methods are used to compute the runoff approximation. We can say the Rainfall is the result of rainfall features and watershed characteristics. These methods are as following,

- Rational. Runoff coefficient., Inglis Formula for Ghat, Inglis Formula for Non-Ghat, Regression Formula., khosla's Formula, Dickn's Formula
- Rayve's Formula, Mayer's Formula, Countagne Formula
- Ali Nawaj Jung Bahadur Formula,  $\phi$  index infiltration.
- $\omega$  index infiltration.



```

printf("\n\n\t *** 2.Runoff Coefficient Method
***\n\n ");
printf("\n\t Enter the value of Runoff coefficient
\t=");
scanf("%f",&K);
printf("\t Enter value of Precipitation (mm/hr)
\t=");
scanf("%f",&P);

R= (K*P);
printf("\n\t Runoff (m3/s)=%5.2f",R);
getch();
break;

}
case 13: /*** 13.W-Index Infiltration Formula ***/

{
clrscr();
printf("\n\n\t ***12.W-Index Infiltration Formula
***\n\n ");
printf("\t Enter value of Water loss through
Infiltration \t=");
scanf("%f",&F);
printf("\t Enter value of time, during which
rainfall intensity more than infiltration capacity \t=");
scanf("%f",&tr);

```

```

Q= (F/tr);
printf("\n\t Runoff (cm/hr)=%5.2f",Q);
getch();
break;

} // end of case 14
} // end of all cases
} } // manin switch statement end
// end of 1 start and end brace bracket

```

#### IV. RESULTS AND DISCUSSION

This paper deals with the output which attained by measurements of the Runoff computation methods by C++ Language. The program is built in the C language, Turbo C++ Version 3.0.

➤ **Steps to follow for Using the software:**

- 1) Enter the option from 1 to 14 of which you want to calculate result.
  - 2) Give desired values for get desirable output.
  - 3) Press enter key to get output.
  - 4) Press the enter key again to switch over to the main page.
- Go with the same procedure to calculate the another values.

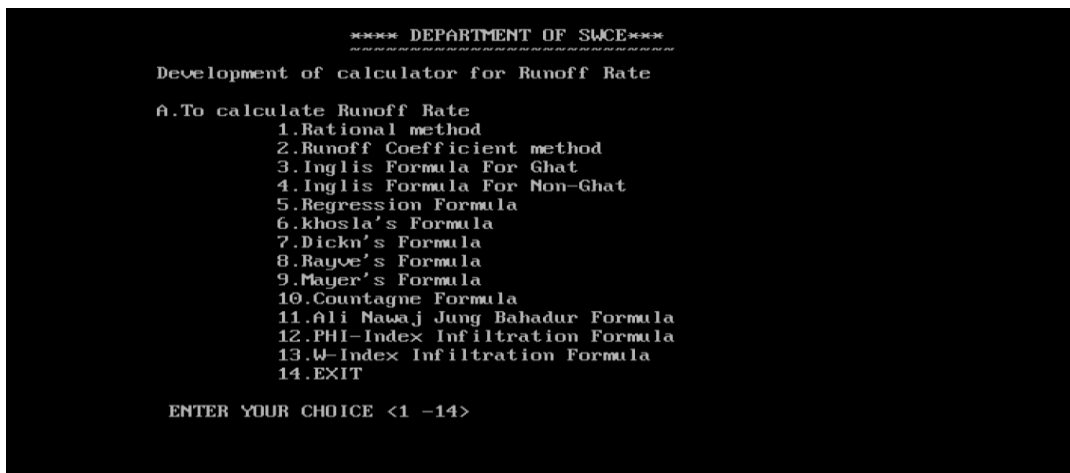


Fig. Output window of main page

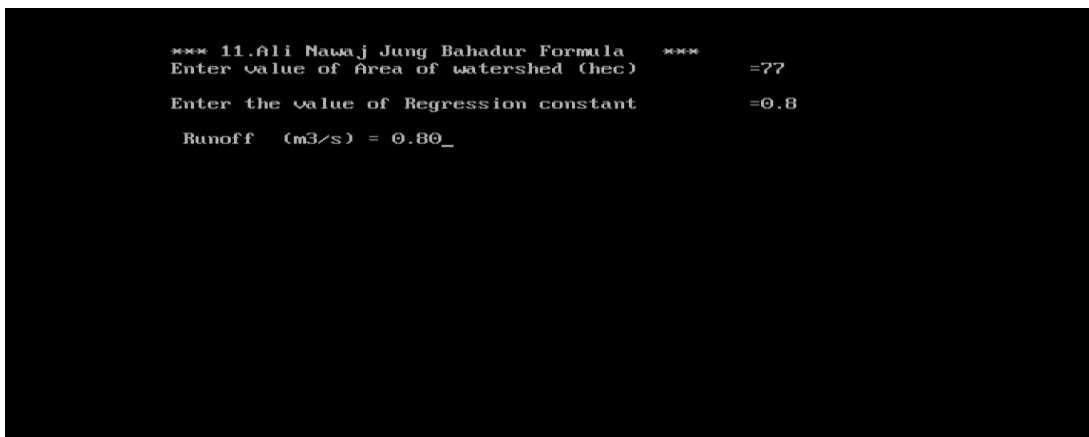


Fig. Output window of Ali Nawaj jung bahadur Formula

```

*** 12. PHI-Index Infiltration Formula ***
Enter value of Total Basin Recharge (cm)      Br=14.4
Enter value of Rainfall Discharge (hr)       Rd=4

Runoff (cm/hr) = 3.60

```

Fig. Output window of  $\phi$ -index Infiltration formula

```

*** 13. W-Index Infiltration Formula ***

Enter value of Water loss through Infiltration      F=60
Enter value of time during which rainfall intensity more than infiltrat
ion capacity      tr=2

Runoff (cm/hr) =30.00_

```

Fig. Output window of  $\omega$ -index infiltration formula

## V. SUMMARY AND CONCLUSIONS

### ➤ Summary

The Runoff computation methods like, Rational,  $\phi$  index infiltration,  $\omega$  index infiltration, Runoff coefficient, Inglis formula, khosala's method, Regression formula, Dickn's formula, Ryve's formula, Mayer's formula, Countage formula, Ali Nawaj Jang Bahadur formula were correctly calculated. But that procedure was takes place manually so it was very time consuming process. As we created the software by using C language for calculate such methods. And make calculation speedy. Therefore, the software was found to be very vital beneficial for measuring the Runoff Method of the Watershed.

### ➤ Conclusions

- The determinations/calculations are done very correctly by using C language.
- Software is user friendly.
- Software is time efficient.
- This is a beneficial for calculating the Runoff of the watershed.

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