**LAB Week 5:**

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**Reg#:SP21-BSE-008**

1. **Exercise 1:** Write a program to calculate the electricity bill. The rates of electricity per unit are as follow:
   1. If the units consumed are equal or less than 300, then the cost is Rs. 3/- per unit
   2. If units consumed are more than 300, then the cost is Rs. 3.5/- per unit and surcharge of 5% of bill is added.

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| **Solution:** **#include<stdio.h>**  **int main()**  **{**  **int unit, surcharge;**  **float bill;**  **printf("Enter a Units:");**  **scanf("%d",&unit);**  **surcharge=0.05\*unit;**  **if(unit>0&&unit<=300)**  **{**  **bill=unit\*3+surcharge;**  **}**  **else if(unit>300)**  **{**  **bill=unit\*3.5+surcharge;**  **}**  **printf("The bill is %.2f = ",bill);**  **return 0;**  **}** |

**Exercise 2:** Write a program that reads 5 marks of different subjects out of 100 from the keyboard and determines and displays the sum and percentile of the marks. Then print grades and credit points on the basic of percentile as per following table:

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| **Grades** | **Letter Grade** | **Credit Points** | **Percentage Marks** |
| A | ( Excellent) | 4.0 | 90and above |
| A- |  | 3.7 | 85-89 |
| B+ |  | 3.3 | 80-84 |
| B | (Good) | 3.0 | 75-79 |
| B- |  | 2.7 | 70-74 |
| C+ |  | 2.3 | 65-69 |
| C | (Average) | 2.0 | 60-64 |
| C- |  | 1.7 | 55-59 |
| D | (Minimum passing) | 1.3 | 50-54 |
| F | (Failing) | 0.0 | Less than 50 |

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| **Solution:**  **#include<stdio.h>**  **int main()**  **{**  **int marks[10],n,i;**  **float sum=0,percentage;**  **printf("Enter the size of array:");**  **scanf("%d",&n);**  **printf("Enter %d Subject Marks:\n",n);**  **for(i=1;i<=n;i++)**  **{**  **scanf("%d",&marks[i]);**  **}**  **printf("The sum of marks is:\n");**  **for(i=1;i<=n;i++)**  **{**  **sum=sum+marks[i];**  **}**  **printf("%.2f\n\n",sum);**    **printf("The percentage of marks is:\n");**  **for(i=1;i<=n;i++)**  **{**  **percentage=sum/n;**  **}**  **printf("%.2f\n\n",percentage);**  **if(percentage>=90)**  **{**  **printf("Grades:A\nCredit point:4.0");**  **}**  **else if(percentage>=85&&percentage<=89)**  **{**  **printf("Grades:A-\nCredit point:3.7");**  **}**  **else if(percentage>=80&&percentage<=84)**  **{**  **printf("Grades:B+\nCredit point:3.3");**  **}**  **else if(percentage>=75&&percentage<=79)**  **{**  **printf("Grades:B\nCredit point:3.0");**  **}**  **else if(percentage>=70&&percentage<=74)**  **{**  **printf("Grades:B-\nCredit point:2.7");**  **}**  **else if(percentage>=65&&percentage<=69)**  **{**  **printf("Grades:C+\nCredit point:2.3");**  **}**  **else if(percentage>=60&&percentage<=64)**  **{**  **printf("Grades:C\nCredit point:2.0");**  **}**  **else if(percentage>=55&&percentage<=59)**  **{**  **printf("Grades:c-\nCredit point:1.7");**  **}**  **else if(percentage<50)**  **{**  **printf("Grades:Failing\nCredit point:0.0");**  **}**  **else**  **{**  **printf("Error!!!");**  **}**    **}** |

**Exercise 3:** While purchasing certain items, a discount of 10% is offered if the quantity purchased is more than 1000. If quantity and price per item are input through the keyboard, write a program to calculate the total expenses.

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| **Solution:** **#include<stdio.h>**  **int main()**  **{**  **int quantity,price,c,totalexpense;**  **printf("Enter the quantaity \n");**  **scanf("%d",&quantity);**  **printf("Enter the price \n");**  **scanf("%d",&price);**  **if(quantity>1000)**  **{**  **c=price\*10/100;**  **printf("Their is a discount of %d \n",c);**  **totalexpense=price-c;**  **printf("the totalexpense is :\n%d",totalexpense);**  **}**  **if(quantity<1000)**  **printf("no discount");**    **return 0;**  **}** |

**Exercise 4:** A company insures its drivers in the following cases:

1. − If the driver is married.
2. − If the driver is unmarried, male & above 30 years of age.
3. − If the driver is unmarried, female & above 25 years of age.
4. In all other cases the driver is not insured. If the marital status, gender and age of the driver are the inputs, write a program to determine whether the driver is to be insured or not

Hint: For marital status you may ask user to enter 0 for married and 1 for unmarried. You may ask user to enter 0 for male and 1 for female.

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| **Solution:**  **#include <stdio.h>**  **main()**  **{**  **char g,s;**  **int a;**  **printf("Enter Martial Status (m) for Married And (u) For Unmarried:");**  **scanf("%c",&s);**  **printf("\nEnter Gender (m) For Male And (f) For Female:");**  **scanf("\n%c",&g);**  **printf("\nEnter Age ");**  **scanf("\n%d",&a);**  **if(((s=='m'))||((s=='u')&&(g=='m')&&(a>30))||((s=='u')&&(g=='f')&&(a>25)))**  **printf("\nDriver is insured");**  **else**  **printf("\nDriver is not insured");**  **return 0;**  **}** |

**Exercise 5: Print the following series using for loop**

* 1. Print numbers from 1 to 100 with increment of 1
  2. Print numbers from 100 to 1 with decrement of 1
  3. Print numbers from 20 to 2 in steps of -2
  4. Print sequence of numbers: 2, 5, 8, 11, 14, 17, 20
  5. Print sequence of numbers: 99, 88, 77, 66, 55, 44, 33, 22, 11, 0

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| **Solution:**  **#include<stdio.h>**  **int main()**  **{**  **int n,i;**  **printf("Enter the number:");**  **scanf("%d",&n);**  **printf("Number fom 1 to 100 increment by 1\n");**  **for(i=1;i<=n;i++)**  **{**  **printf("\t%d",i);**  **}**    **}**  **#include<stdio.h>**  **int main()**  **{**  **int i;**  **for(i=100;i>0;i--)**  **{**  **printf("%d ",i);**  **}**  **return 0;**  **}**  **#include<stdio.h>**  **int main()**  **{**  **int i;**  **for(i=20;i>=2;i=i-2)**  **{**  **printf("%d ",i);**  **}**  **return 0;**  **}**  **#include<stdio.h>**  **int main()**  **{**  **int i;**  **for(i=2;i<=20;i=i+3)**  **{**  **printf("%d ",i);**  **}**  **return 0;**  **}**  **#include<stdio.h>**  **int main()**  **{**  **int i;**  **for(i=100-1;i>=0;i=i-11)**  **{**  **printf("%d ",i);**  **}**  **return 0;**  **}** |

**Exercise 6:** Write a program that reads in five integers and then determines and prints the largest and smallest integers in the group. Use loop to input the values from the user (Hint: use two of the variables to hold the current largest and smallest integers.)

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| **Solution:**  **#include<stdio.h>**  **int main()**  **{**  **int intt[5],i;**  **for(i=0;i<5;i++)**  **{**  **printf("enter the integer= ");**  **scanf("%d",&intt[i]);**  **}**  **if(intt[0]>intt[1] && intt[0]>intt[2] && intt[0]>intt[3] && intt[0]>intt[4] )**  **{**  **printf("greatest integer is %d",intt[0]);**  **}**  **else if(intt[1]>intt[0] && intt[1]>intt[2] && intt[1]>intt[3] && intt[1]>intt[4])**  **{**  **printf("greatest integer is %d",intt[1]);**  **}**  **else if(intt[2]>intt[0] && intt[2]>intt[1] && intt[2]>intt[3] && intt[2]>intt[4])**  **{**  **printf("greatest integer is %d",intt[2]);**  **}**  **else if(intt[3]>intt[0] && intt[3]>intt[1] && intt[3]>intt[2] && intt[1]>intt[4])**  **{**  **printf("greatest integer is %d",intt[3]);**  **}**  **else if(intt[4]>intt[0] && intt[4]>intt[1] && intt[4]>intt[2] && intt[4]>intt[3])**  **{**  **printf("greatest integer is %d",intt[4]);**  **}**  **printf("\n");**  **if(intt[0]<intt[1] && intt[0]<intt[2] && intt[0]<intt[3] && intt[0]<intt[4] )**  **{**  **printf("smallest integer is %d",intt[0]);**  **}**  **else if(intt[1]<intt[0] && intt[1]<intt[2] && intt[1]<intt[3] && intt[1]<intt[4])**  **{**  **printf("smallest integer is %d",intt[1]);**  **}**  **else if(intt[2]<intt[0] && intt[2]<intt[1] && intt[2]<intt[3] && intt[2]<intt[4])**  **{**  **printf("smallest integer is %d",intt[2]);**  **}**  **else if(intt[3]<intt[0] && intt[3]<intt[1] && intt[3]<intt[2] && intt[1]<intt[4])**  **{**  **printf("smallest integer is %d",intt[3]);**  **}**  **else if(intt[4]<intt[0] && intt[4]<intt[1] && intt[4]<intt[2] && intt[4]<intt[3])**  **{**  **printf("smallest integer is %d",intt[4]);**  **}**  **return 0;**  **}** |

**Exercise 7:** Write a program that reads a number and determines and prints whether it is odd or even. (Hint: use the modulus operator. Any even number is multiple of two, and any multiple of two gives a remainder of zero when divided by two.)

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| **Solution:**  **#include <stdio.h>**  **#include <string.h>**  **int main()**  **{**  **int n;**  **printf("Enter a number");**  **scanf("%d",&n);**  **if(n%2==0)**  **{**  **printf("Even number");**  **}**  **else**  **{**  **printf("Odd number");**  **}**  **return 0;**  **}** |

**Exercise 8:** Write a program which asks the user to enter 10 numbers and prints out the message “even” if the number is even and “divisible by three” if the number is divisible by three.

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| **Solution:**  **#include <stdio.h>**  **int main()**  **{**  **int number[10],i,n;**  **for(i=1;i<=10;i++)**  **{**  **printf("Enter a number %d:",n);**  **scanf("%d",&number[i]);**  **n++;**  **}**  **for(i=1;i<=10;i++)**  **{**  **if(number[i]%2==0&&number[i]%3==0)**  **{**  **printf("\t%d is Even Number",number[i]);**  **}**  **}**  **return 0**  **}** |

**Exercise 9:** A person invests $1000.0 in a savings account yielding 5% interest. Assuming that all interest is left on deposit in the account, calculate and print the amount of money in he account at the end of each year for 10 years. Use the following formula for determining these amounts:

a = p(1+r)n

where

p is the original investment(i.e. the principal)

r is the annual interest rate

n is the number of years

a is the amount on deposit at the end of the nth year.

Sample output

Year Amount on deposit

1. 1050.00
2. 1102.50
3. 1157.63
4. 1215.51
5. 1276.28
6. 1340.10
7. 1407.10
8. 1477.46
9. 1551.33
10. 1628.89

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| **Solution**  #include<stdio.h>  int main(void)  {  float amount; //amount on deposit  float principal=1000.0; //starting principal  float rate=0.05; //anual interest rate  int year;    printf("Year\tamount to deposit\n");  for(year=1;year<=10;++year)  {  //calculate new amount for specified year  amount=principal\*pow(1.0+rate,year);  //output table  printf("%d%\t%.2f\n",year,amount);  }  return 0;  } |

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