עבודת גמר C++

תוכנה לניהול פרויקטים

שנה ב' סמסטר קיץ תש"פ

מגישים:

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מרצים

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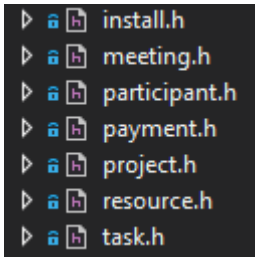
תאריך: 28.09.2020

מבוא ורקע

1. ניהול פרויקטים הינו אתגר אשר מהווה אתגר ניהולי ואתגר טכני.
2. על כן התוכנה שאנחנו מציגים בפרויקט זה , מאחסנת ומציגה נתונים על הפרויקט מתחילתו ועד סופו, לפי הסדר שהוזנו על ידי המשתמש.
3. המשתמש יכניס לתוך התוכנה את שם הפרויקט, שמות המפגשים וסוגי המפגשים בפרויקט , את כמות הכסף הנדרש אם נדרש , את פרטי המשתתפים ואת המשאבים הנדרשים עבור התקנות של תכולות הפרויקט.

1. מבנה התוכנה והמחלקות

רשימת קבצי הHEADER של המחלקות :

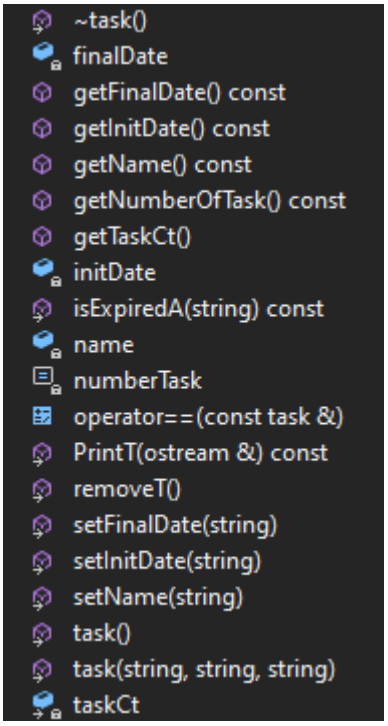


להלן פירוט והסבר של כל מחלקה :

א. מחלקת task – מחלקה האב של מחלקות install וmeeting "סבא" של מחלקת payment . מחזיקה שדות :

תאריך התחלה **string initDate**	**תאריך סוף** **string** **finalDate**	**שם** **string name**

מטרת המחלקה להוות אוביקט בסיס למשימה שתוכל בתוך פרויקט.
להלן רשימה סה"כ פונקציות שהמחלקה מכילה :



ב. מחלקת meeting -מחלקת ילד של task ומחלקת אב של payment.
המחלקה נעזרת במחלקת עזר participant.
בנוסף לשדות של task מחזיקה את השדות:

משתתפים **participant * participant**	**מיקום** **string** **location**
כמות משתתפים **int numOfParticipants**	

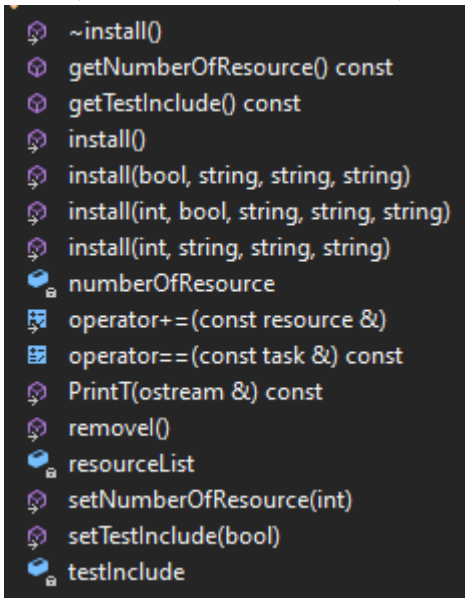
מטרת המחלקה להוות אוביקט פגישה שמצביע על נתוני משתתפי הפגישה ממחלקת particpant ומחזיק נתון על מיקום הפגישה.
להלן רשימה סה"כ פונקציות שהמחלקה מכילה:

```
~meeting()
getLocation() const
getNumberOfParticipants() const
location
meeting()
meeting(string, string, string, int)
meeting(string, string, string, string)
meeting(string, string, string, string, int)
numberOfParticipants
operator+=(const participant &)
operator==(const task &) const
participantList
PrintT(ostream &) const
removeA()
setLocation(string)
setNumberOfParticipants(int)
```

ג. מחלקת install – מחלקת ילד של task , נעזרת במחלקת עזר של resource .
בנוסף לשדות של מחלקת task :

כמות סוגי משאבים **intNumberOfResource**	**הפנייה למשאב** **resource* listOfResource**
כולל בדיקה **bool test**	

מטרת המחלקה היא ליצור אוביקט מסוג התקנה, בנוסף מקשר לכמות וסוג המשאבים הנדרשים עבור ההתקנה
להלן רשימה סה"כ הפונקציות שהמחלקה מכילה :



ד. מחלקת payment– מחלקת ילד של meeting , בנוסף לשדות של מחלקת task וmeeting :

כמות הכסף שנדרש לתשלום **int amountPay**

מטרת המחלקה היא ליצור אוביקט של פגישה שבנוסף לפגישה נדרש בה גם תשלום כספי.
להלן רשימה של סה"כ הפונקציות שהמחלקה מכילה :

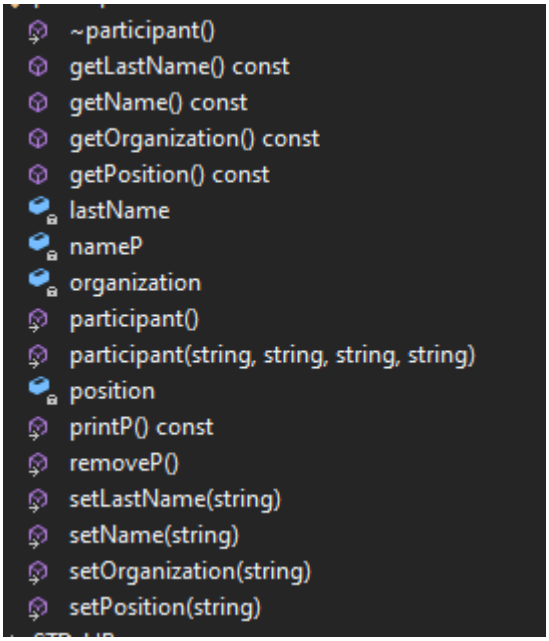
```
~payment()
amountOfCurrency
currency
getAmountOfCurrency() const
getCurrency() const
payment()
payment(string, string, int, string, string, string, int)
PrintT(ostream &) const
removePA()
setAmountOfCurrency(int)
setCurrency(string)
```

ה. מחלקת participant, מחלקה שמחזיקה נתונים אודות המשתתפים בפגישות, מחזיקה בשדות:

שם המשתתף string name	**שם משפחה המשתתף string lastName**	**ארגון string organization**	**תפקיד string position**

מטרת המחלקה היא להחזיק נתונים אודות כלל המשתתפים בפגישות של הפרויקט.

להלן רשימה של סה"כ הפונקציות שהמחלקה מכילה:



ו. מחלקת resource, מחלקה שמחזיקה נתונים אודות המשאבים הנדרשים לכל התקנה . מחזיקה בשדות :

כמות משאב amountOfReasource	**שם המשאב nameOfResource**	**שם גודל המשאב string nameOfResource**

מטרת המחלקה להחזיק נתונים אודות כלל המשאבים הדרושים עבור התקנת התוכלות בפרויקט.

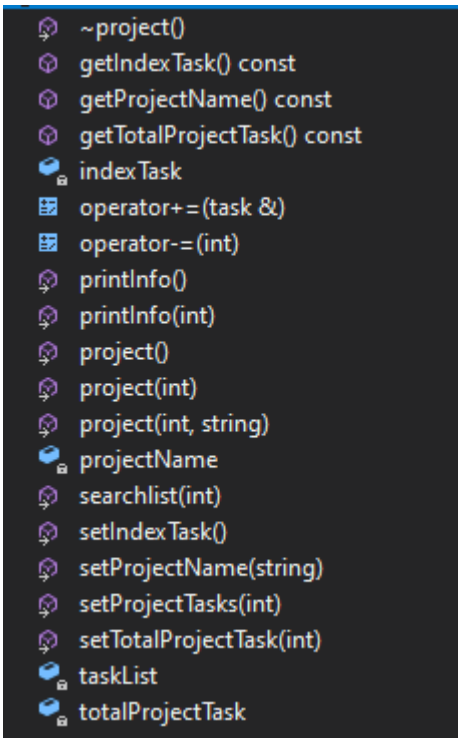
להלן רשימה של סה"כ הפונקציות שהמחלקה מכילה :

```
~resource()
amountOfResource
getAmountOfResource() const
getNameOfResource() const
getUnit() const
nameOfResource
printR() const
removeR()
resource()
resource(string, string, double)
setAmountOfResource(double)
setNameOfResource(string)
setUnit(string)
unit
```

ז. מחלקת project , מחלקה שמכילה בתוכה כמות אובייקטים מסוג task , אשר יכולים להיות או install או meeting או payment.
המחלקה מחזיקה בשדות :

מספר משימה const in numberTask	**כמות משימות בפרויקט int totalTask**	**שם הפרויקט string projectName**	**אינדקס נוכחי int indexTask**	**רשימת מטלות task **tasklist**
מספר הפרויקט const int numberProject;	**סופר פרויקטים static int projCt;**			

מטרת המחלקה היא לאגד לתוכה מכלול של משימות לפי הזנה של המשתתף ובעצם לאפשר למשתמש גישה לפונקציות אשר נותנות מבט כולל על הפרויקט.
להלן רשימה של סה"כ הפונקציות שהמחלקה מכילה :



טבלה מסכמת של כלל הפונקציות

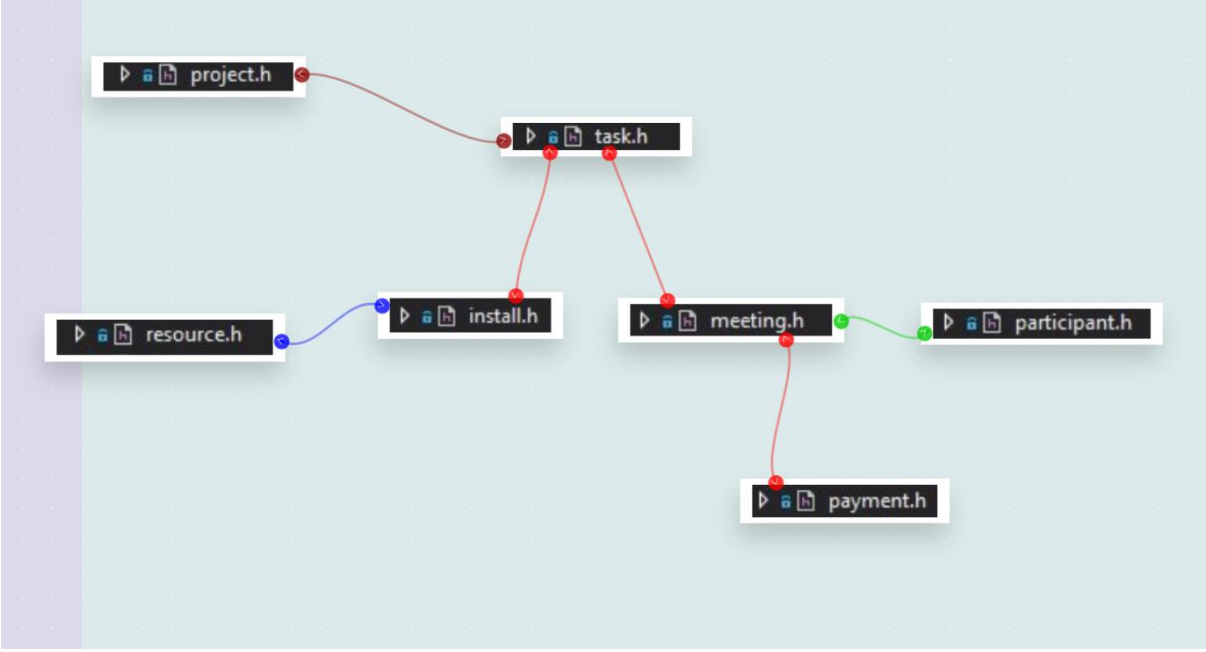
מחלקה	תיאור	תאריך התחלה string initDate	תאריך סוף string finalDate	שם string name	משתתפים *string participant	מיקום string location	כמות הכסף שנדרש לתשלום int amountPay	כולל בדיקה bool test	הפנייה לפגישה *access accessReffer	הפנייה להתקנה *install installReffer	מספר משימה const in number Task	סופר משימות static int taskCout	כמות משימות בפרויקט int totalTask	כמות סוגי משאבים intNumberOf Resource	הפנייה למשאב *resource listOfResource	כמות משאב amountOfReasource	שם המשאב nameOfResource	שם גודל המשאב string nameOfResource	שם המשתתף string name	שם משפחה המשתתף string lastName	ארגון string organization	תפקיד string position	כמות משתתפים int numOfParticipants	שם הפרויקט string projectName	אינדקס נוכחי int indexTask	רשימת מטלות task **tasklist
1	משימה task	V	V	V	X	X	X	X	X	X	V	V	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	פגישה meeting	*	*	*	V	V	X	X	X	X	*	*	X	X	X	X	X	X	X	X	X	X	V	X	X	X
4	פגישהXתשלום payment	*	*	*	*	*	V	X	X	V	*	*	X	X	X	X	X	X	X	X	X	X	*	X	X	X
3	התקנהinstall	*	*	*	X	X	X	V	V	X	*	*	X	X	V	X	X	X	X	X	X	X	X	X	X	X
5	פרויקט project	X	X	X	X	X	X	X	X	X	V	X	V	X	X	X	X	X	X	X	X	X	X	V	V	V
6	משאב resource	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X	X	X
7	משתתף participant	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	V	V	V	V	X	X	X	X

V -קיים במחלקה

***- ירושה**

X- לא קיים במחלקה

תלות בין המחלקות



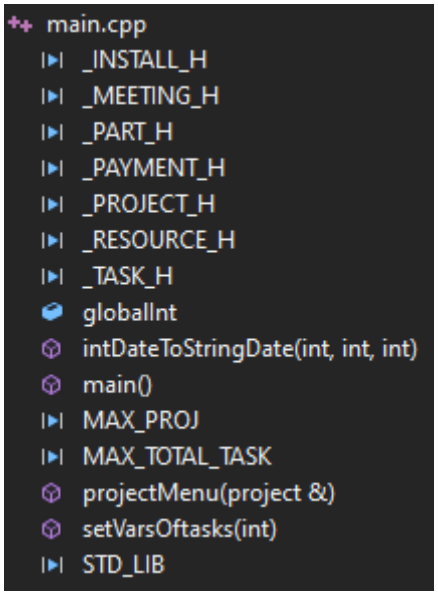
באיור ניתן לראות את הקשר בין המחלקות השונות כפי שתוארו בתחילת המסמך.

קשר מאותו צבע מתאר ירושה, שאר הקשר מתארים שימוש במחלקה השנייה.

קשר בצבעים ירוק וכחול מתארים קשר שימוש של מחלקת install וmeeting בresource וparticipant בהתאמה.

קשר בצבע בורדו מתאר קשר שימוש של מחלקת project במחלקה האבסטרקטית task .

מבנה הMAIN



הMain בנוי ממספר חלקים, בחלק הראשון ניתן לבצע הדגמה של בניית 3 פרוייקטים עם 4 משימות כאשר בכל משימה נוספים או משתתפים (participants) או משאבים (resources) ההוספה מתבצעת דרך אופרטור += וביצוע downcast מאובייקט האב task.

בחלק השני קיים תפריט ראשי המאפשר למשתמש לבנות אחד מהבאים,(המספור לפי הבחירה בתפריט) :

1. פרויקט ריק עם 0 משימות.
2. פרויקט עם מספר משימות שהמשתמש יבחר.
3. פרויקט עם שם ומספר משימות שהמשתמש יבחר.

לאחר יצירת הפרויקט המשתמש יקבל הודעה שמעניקה לו את שם הפרויקט בברית המחדל שנוצר ואת מספר הפרויקט .

במידה ויבחר המשתמש לנהל את הפרויקט , להוסיף משימות ניתן לבצע זאת על ידי בחירת באפשרות 4 ו5 , אשר מוצאות את הפרויקט המדובר לפי השם הייחודי של הפרויקט (הראשון שימצא) או לפי מספר הייחודי שניתן לכל פרויקט.

בנוסף ניתן להציג את כלל הפרויקטים אשר נפתחו ואת פרטיהם.

לאחר מכן המשתמש יכנס לתפריט נוסף שבו יהיה ניתן להוסיף, למחוק , להדפיס ,לשנות שם ולמחוק את הפרויקט.

כלל המשימות מנוהלות במשתנה גלובלי בMAIN שניתן להגביל את כמות המשימות אשר בשימוש,

באותו אופן הוגבלו כמות הפרויקטים הפתוחים.

הפרויקט עבר קומפילציה , הינו עובד ותקין כאשר חבילות SDK הבאות מותקנות:

Windows 10 SDK (10.0.17763.0)

Windows 10 SDK (10.0.18362.0)

תצלומי מסך מהDEMO אפשרות 1 בעליית המסך:

```
C:\Users\MRed\Documents\GitHub\finalproject\x64\Debug\Project1.exe
Welcome to Project Mangment software
as a start the the Project can demo 3 projects if you want a demo.
for demo enter 1, for skip enter 0
1
For task number: 1000
enter details about the participants.For task number: 1001
enter details about the participants.For task number: 1002
enter details about the participants.For task number: 1003
enter details about the resources.
****project default0 was created****


*****************************************************************************

Project Summer quest, info of the tasks
-----------------------------------------------------------------------------

Task number: 1,the id of the task is: 1000

The id of the meeting:1000
The name of the meeting:RFI
The initial date of meeting:23 / 09 / 2020
The final date of meeting:25 / 09 / 2020
There are 2 in the meeting

The details of the particpant:
participant number 1

Name of particpant: David
Last Name: Musaev
Name of the Organization: Ruppin
Position in the organization: studentparticipant number 2

Name of particpant: Yakir
Last Name: Maymon
Name of the Organization: Ruppin
Position in the organization: student
-----------------------------------------------------------------------------
```

```
-----------------------------------------------------------------------

Task number: 2,the id of the task is: 1001

The id of the meeting:1001
The name of the meeting:RPI
The initial date of meeting:24 / 09 / 2020
The final date of meeting:25 / 09 / 2020
There are 2 in the meeting

The details of the particpant:
participant number 1

Name of particpant: David
Last Name: Musaev
Name of the Organization: Ruppin
Position in the organization: studentparticipant number 2

Name of particpant: Yakir
Last Name: Maymon
Name of the Organization: Ruppin
Position in the organization: student
-----------------------------------------------------------------------

-----------------------------------------------------------------------

Task number: 3,the id of the task is: 1002

The id of the meeting:1002
The name of the meeting:pdr
The initial date of meeting:12 / 10 / 2020
The final date of meeting:14 / 10 / 2020
There are 2 in the meeting

The details of the particpant:
participant number 1

Name of particpant: Shaked
Last Name: Spector
Name of the Organization: Ruppin
Position in the organization: studentparticipant number 2

Name of particpant: Mario
Last Name: Mario
Name of the Organization: Lala Land
Position in the organization: Hero
The amount of money that need to pay:2000 NIS

-----------------------------------------------------------------------
```

```
--------------------------------------------------------------------------------

*******************************************************************************

****project Oath project was created****


****project Winter project was created****


*******************************************************************************

Project Winter project, info of the tasks
--------------------------------------------------------------------------------

Task number: 1,the id of the task is: 1000

The id of the meeting:1000
The name of the meeting:RFI
The initial date of meeting:23 / 09 / 2020
The final date of meeting:25 / 09 / 2020
There are 2 in the meeting

The details of the particpant:
participant number 1

Name of particpant: David
Last Name: Musaev
Name of the Organization: Ruppin
Position in the organization: studentparticipant number 2

Name of particpant: Yakir
Last Name: Maymon
Name of the Organization: Ruppin
Position in the organization: student
--------------------------------------------------------------------------------


--------------------------------------------------------------------------------
```

Select C:\Users\MRed\Documents\GitHub\finalproject\x64\Debug\Project1.exe

```
Project Winter project, info of the tasks
-------------------------------------------------------------------------------

Task number: 1,the id of the task is: 1000

The id of the meeting:1000
The name of the meeting:RFI
The initial date of meeting:23 / 09 / 2020
The final date of meeting:25 / 09 / 2020
There are 2 in the meeting

The details of the particpant:
participant number 1

Name of particpant: David
Last Name: Musaev
Name of the Organization: Ruppin
Position in the organization: studentparticipant number 2

Name of particpant: Yakir
Last Name: Maymon
Name of the Organization: Ruppin
Position in the organization: student
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------

Task number: 2,the id of the task is: 1001

The id of the meeting:1001
The name of the meeting:RPI
The initial date of meeting:24 / 09 / 2020
The final date of meeting:25 / 09 / 2020
There are 2 in the meeting

The details of the particpant:
participant number 1

Name of particpant: David
Last Name: Musaev
Name of the Organization: Ruppin
Position in the organization: studentparticipant number 2

Name of particpant: Yakir
Last Name: Maymon
Name of the Organization: Ruppin
Position in the organization: student
-------------------------------------------------------------------------------
```

```
--------------------------------------------------------------------------------

Task number: 3,the id of the task is: 1002

The id of the meeting:1002
The name of the meeting:pdr
The initial date of meeting:12 / 10 / 2020
The final date of meeting:14 / 10 / 2020
There are 2 in the meeting

The details of the particpant:
participant number 1

Name of particpant: Shaked
Last Name: Spector
Name of the Organization: Ruppin
Position in the organization: studentparticipant number 2

Name of particpant: Mario
Last Name: Mario
Name of the Organization: Lala Land
Position in the organization: Hero
The amount of money that need to pay:2000 NIS

--------------------------------------------------------------------------------

********************************************************************************
```

```
*****************************************************************************

Project Oath project, info of the tasks
-----------------------------------------------------------------------------

Task number: 1,the id of the task is: 1000

The id of the meeting:1000
The name of the meeting:RFI
The initial date of meeting:23 / 09 / 2020
The final date of meeting:25 / 09 / 2020
There are 2 in the meeting

The details of the particpant:
participant number 1

Name of particpant: David
Last Name: Musaev
Name of the Organization: Ruppin
Position in the organization: studentparticipant number 2

Name of particpant: Yakir
Last Name: Maymon
Name of the Organization: Ruppin
Position in the organization: student
-----------------------------------------------------------------------------

-----------------------------------------------------------------------------

Task number: 2,the id of the task is: 1001

The id of the meeting:1001
The name of the meeting:RPI
The initial date of meeting:24 / 09 / 2020
The final date of meeting:25 / 09 / 2020
There are 2 in the meeting

The details of the particpant:
participant number 1

Name of particpant: David
Last Name: Musaev
Name of the Organization: Ruppin
Position in the organization: studentparticipant number 2

Name of particpant: Yakir
Last Name: Maymon
Name of the Organization: Ruppin
Position in the organization: student
-----------------------------------------------------------------------------
```

```
--------------------------------------------------------------------------------

--------------------------------------------------------------------------------

Task number: 3,the id of the task is: 1002

The id of the meeting:1002
The name of the meeting:pdr
The initial date of meeting:12 / 10 / 2020
The final date of meeting:14 / 10 / 2020
There are 2 in the meeting

The details of the particpant:
participant number 1

Name of particpant: Shaked
Last Name: Spector
Name of the Organization: Ruppin
Position in the organization: studentparticipant number 2

Name of particpant: Mario
Last Name: Mario
Name of the Organization: Lala Land
Position in the organization: Hero
The amount of money that need to pay:2000 NIS

--------------------------------------------------------------------------------

********************************************************************************
```

```
--------------------------------------------------------------------------------

*******************************************************************************

--------------------------------------------------------------------------------

Task number: 4,the id of the task is: 1003


The name of the install:installation of the component
The initial date of install:15 / 10 / 2020
The final date of install:30 / 10 / 2020
There are 2 in the installation

Name of Resource: notebook

amount: 3 piece


Name of Resource: wood

amount: 3 kg

--------------------------------------------------------------------------------

There is no such a task!
There is no such task in the list!

*******************************************************************************
```

```
Project Summer quest, info of the tasks
-------------------------------------------------------------------------------

Task number: 1,the id of the task is: 1000

The id of the meeting:1000
The name of the meeting:RFI
The initial date of meeting:23 / 09 / 2020
The final date of meeting:25 / 09 / 2020
There are 2 in the meeting

The details of the particpant:
participant number 1

Name of particpant: David
Last Name: Musaev
Name of the Organization: Ruppin
Position in the organization: studentparticipant number 2

Name of particpant: Yakir
Last Name: Maymon
Name of the Organization: Ruppin
Position in the organization: student
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------

Task number: 2,the id of the task is: 1001

The id of the meeting:1001
The name of the meeting:RPI
The initial date of meeting:24 / 09 / 2020
The final date of meeting:25 / 09 / 2020
There are 2 in the meeting

The details of the particpant:
participant number 1

Name of particpant: David
Last Name: Musaev
Name of the Organization: Ruppin
Position in the organization: studentparticipant number 2

Name of particpant: Yakir
Last Name: Maymon
Name of the Organization: Ruppin
Position in the organization: student
-------------------------------------------------------------------------------

*******************************************************************************
```

```
-----------------------------------------------------------------------------

Task number: 2,the id of the task is: 1001

The id of the meeting:1001
The name of the meeting:RPI
The initial date of meeting:24 / 09 / 2020
The final date of meeting:25 / 09 / 2020
There are 2 in the meeting

The details of the particpant:
participant number 1

Name of particpant: David
Last Name: Musaev
Name of the Organization: Ruppin
Position in the organization: studentparticipant number 2

Name of particpant: Yakir
Last Name: Maymon
Name of the Organization: Ruppin
Position in the organization: student
-----------------------------------------------------------------------------

*****************************************************************************
Do you want to start a new project ? (if yes press 1, if no press 0)
```

תצלום מסך מתפריט למשתמש

C:\Users\MRed\Documents\GitHub\finalproject\x64\Debug\

```
Welcome to Project Mangment software
as a start the the Project can demo 3 projects if you want a demo.
for demo enter 1, for skip enter 0
0
Do you want to start a new project ? (if yes press 1, if no press 0)
1
Please choose which project type do you want :
1.Empty project
2.Project with tasks
3.Project with name and tasks
4.manage a project by its name
5.manage a project by its unique number
6.print info of all projects
0.EXIT
1

****project default0 was created****

Please choose which project type do you want :
1.Empty project
2.Project with tasks
3.Project with name and tasks
4.manage a project by its name
5.manage a project by its unique number
6.print info of all projects
0.EXIT
1

****project default1 was created****

Please choose which project type do you want :
1.Empty project
2.Project with tasks
3.Project with name and tasks
4.manage a project by its name
5.manage a project by its unique number
6.print info of all projects
0.EXIT
2
Please enter number of tasks:
2

****project default2 was created****

Please choose which project type do you want :
1.Empty project
2.Project with tasks
3.Project with name and tasks
4.manage a project by its name
5.manage a project by its unique number
6.print info of all projects
0.EXIT
3
Please enter project's name:
ProjectCPP
Please enter number of tasks:
2

****project ProjectCPP was created****

Please choose which project type do you want :
1.Empty project
2.Project with tasks
3.Project with name and tasks
4.manage a project by its name
5.manage a project by its unique number
6.print info of all projects
0.EXIT
6
```

```
****project ProjectCPP was created****

Please choose which project type do you want :
1.Empty project
2.Project with tasks
3.Project with name and tasks
4.manage a project by its name
5.manage a project by its unique number
6.print info of all projects
0.EXIT
6

project number:1
------------------------------
its unique Id is:0
project Name: default0
******************************
******************************
project number:2
------------------------------
its unique Id is:1
project Name: default1
******************************
******************************
project number:3
------------------------------
its unique Id is:2
project Name: default2
******************************
******************************
project number:4
------------------------------
its unique Id is:3
project Name: ProjectCPP
******************************
Please choose which project type do you want :
1.Empty project
2.Project with tasks
3.Project with name and tasks
4.manage a project by its name
5.manage a project by its unique number
6.print info of all projects
0.EXIT
```

הוספת משימה

```
project Name: ProjectCPP
*******************************
Please choose which project type do you want :
1.Empty project
2.Project with tasks
3.Project with name and tasks
4.manage a project by its name
5.manage a project by its unique number
6.print info of all projects
0.EXIT
5
enter the unique number of the project
3
Please enter your choice :
1.SetChange project name
2.Add meeting
3.Remove the last task from the project
4.Find a task in project and show its information
5.Show all the project data
6.delete the project
0.save and Exit
2

enter the name of the meeting
hello

enter the inital date of the meeting

enter the day 23

enter the month 07

enter the year 92

enter the final date of the task

enter the day 25

enter the month 08

enter the year 92

If its a meeting task enter 1
If its a install task enter 2
If its a payment task meeting enter 3
1

enter the location place
israel

enter the number of participants
1
For task number: 1000
enter details about the participants.
Enter info of particpant number 1
nenter the name of the participant: David
enter the name of the last name of participant: Musaev
enter the name of the organization: none
enter the position in the organization: none
Please enter your choice :
```

מציאת המשימה והדפסת הנתונים שלה למשתמש

```
1

enter the location place
israel

enter the number of participants
1
For task number: 1000
enter details about the participants.
Enter info of particpant number 1
menter the name of the participant: David
enter the name of the last name of participant: Musaev
enter the name of the organization: none
enter the position in the organization: none
Please enter your choice :
1.SetChange project name
2.Add meeting
3.Remove the last task from the project
4.Find a task in project and show its information
5.Show all the project data
6.delete the project
0.save and Exit
4

enter the number of the task:
1000

-------------------------------------------------------------------------------

Task number: 1,the id of the task is: 1000

The id of the meeting:1000
The name of the meeting:israel
The initial date of meeting:23 / 7 / 2020
The final date of meeting:25 / 8 / 2020
There are 1 in the meeting

The details of the particpant:
participant number 1

Name of particpant: David
Last Name: Musaev
Name of the Organization: none
Position in the organization: none
-------------------------------------------------------------------------------
Please enter your choice :
1.SetChange project name
2.Add meeting
3.Remove the last task from the project
4.Find a task in project and show its information
5.Show all the project data
6.delete the project
0.save and Exit
```

הסרת משימה מהפרויקט

```
For task number: 1000
enter details about the participants.
Enter info of particpant number 1
nenter the name of the participant: David
enter the name of the last name of participant: Musaev
enter the name of the organization: none
enter the position in the organization: none
Please enter your choice :
1.SetChange project name
2.Add meeting
3.Remove the last task from the project
4.Find a task in project and show its information
5.Show all the project data
6.delete the project
0.save and Exit
4

enter the number of the task:
1000

-------------------------------------------------------------------------------

Task number: 1,the id of the task is: 1000

The id of the meeting:1000
The name of the meeting:israel
The initial date of meeting:23 / 7 / 2020
The final date of meeting:25 / 8 / 2020
There are 1 in the meeting

The details of the particpant:
participant number 1

Name of particpant: David
Last Name: Musaev
Name of the Organization: none
Position in the organization: none
-------------------------------------------------------------------------------
Please enter your choice :
1.SetChange project name
2.Add meeting
3.Remove the last task from the project
4.Find a task in project and show its information
5.Show all the project data
6.delete the project
0.save and Exit
3

removing the last task in the project
Please enter your choice :
1.SetChange project name
2.Add meeting
3.Remove the last task from the project
4.Find a task in project and show its information
5.Show all the project data
6.delete the project
0.save and Exit
5

the info of all task:

*****************************************************************************

Project ProjectCPP, info of the tasks
*****************************************************************************
Please enter your choice :
1.SetChange project name
```

מחיקת הפרויקט

```
Project ProjectCPP, info of the tasks
*********************************************************************
Please enter your choice :
1.SetChange project name
2.Add meeting
3.Remove the last task from the project
4.Find a task in project and show its information
5.Show all the project data
6.delete the project
0.save and Exit
6
Are you sure you want to delete this project? press 1 to delete
1

removing project
project removed
Please choose which project type do you want :
1.Empty project
2.Project with tasks
3.Project with name and tasks
4.manage a project by its name
5.manage a project by its unique number
6.print info of all projects
0.EXIT
6
*******************************
project number:1
-------------------------------
its unique Id is:0
project Name: default0
*******************************
*******************************
project number:2
-------------------------------
its unique Id is:1
project Name: default1
*******************************
*******************************
project number:3
-------------------------------
its unique Id is:2
project Name: default2
*******************************
Please choose which project type do you want :
1.Empty project
2.Project with tasks
3.Project with name and tasks
4.manage a project by its name
5.manage a project by its unique number
6.print info of all projects
0.EXIT
```

קטעי הקוד :

Main.cpp:

```
/*
MANGEMENT PROJECT
authors:
David Musaev
Yakir Maymon
Shaked Spector
to compile this project you MUST HAVE the following sdk installed on Visual Studio:
Windows 10 SDK (10.0.17763.0)
Windows 10 SDK (10.0.18362.0)
*/
#ifndef  _PROJECT_H
#define _PROJECT_H
#include "project.h"
#endif // ! _PROJECT_H

#ifndef _TASK_H
#define _TASK_H
#include "task.h"
#endif // !_TASK_H

#ifndef STD_LIB
#define STD_LIB
#include<fstream>
```

```
#include<istream>

#include <iostream>
#include <string>
using namespace std;

#endif // !STD_LIB

#ifndef _INSTALL_H
#define _INSTALL_H
#include "install.h"
#endif // !_INSTALL_H

#ifndef _MEETING_H
#define _MEETING_H
#include "meeting.h"
#endif // !_PAYACC_H

#ifndef _PART_H
#define _PART_H
#include "participant.h"
#endif // !_PART_H

#ifndef  _RESOURCE_H
#define _RESOURCE_H
#include "resource.h"
#endif // ! _RESOURCE_H
```

```
#ifndef _PAYMENT_H
#define _PAYMENT_H
#include "payment.h"
#endif
#define MAX_PROJ 10//max number of projects the program can hold the same time
#define MAX_TOTAL_TASK 100//max tasks that the project can hold the same time
task* globalTaskList[MAX_TOTAL_TASK]{NULL};//global task list for use
int globalInt{ 0 };//global index for the global tasks



project *projectMenu(project &proj);//second menu for project mangemnt
string intDateToStringDate(int day, int month, int year);//convert date of int to string date
void setVarsOftasks(int globalIndex);//set variables for tasks
int main()
{

	try {
		bool demo;
		cout << "Welcome to Project Mangment software" << endl;
		cout << "as a start the the Project can demo 3 projects if you want a demo.\nfor
demo enter 1, for skip enter 0" << endl;
		cin >> demo;

		if (demo)
		{

			task* process[4], * tasks[4], * quest[4];
```

```
//participants constructors
participant* id1 = new participant("David", "Musaev", "Ruppin", "student");
participant* id2 = new participant("Yakir", "Maymon", "Ruppin", "student");
participant* id3 = new participant("Shaked", "Spector", "Ruppin",
"student");
participant* id4 = new participant();
//resources constructor
resource* res1 = new resource("notebook", "piece", 3);
resource* res2 = new resource("wood", "kg", 3);
resource* res3 = new resource();

//meeting and payment constructor
process[0] = new meeting( "23 / 09 / 2020", "25 / 09 / 2020",  "RFI", "israel",
0);
process[1] = new meeting("24 / 09 / 2020", "25 / 09 / 2020", "RPI", "usa", 0);
process[2] = new payment("12 / 10 / 2020", "14 / 10 / 2020", "pdr",  "NIS",
"israel", 0, 2000 );

//meeting downcast for adding += operator
meeting* meetingProceess = dynamic_cast<meeting*>(process[0]);
*meetingProceess += *id1;
*meetingProceess += *id2;
meeting* meetingProceess1 = dynamic_cast<meeting*>(process[1]);
*meetingProceess1 += *id1;
*meetingProceess1 += *id2;
meeting* meetingProceess2 = dynamic_cast<meeting*>(process[2]);
*meetingProceess2 += *id3;
*meetingProceess2 += *id4;
//install constructor
```

```
process[3] = new install( "15 / 10 / 2020", "30 / 10 / 2020", "installation of
the component", 0, true);
//install downcast for += operator
install* installProceess1 = dynamic_cast<install*>(process[3]);
*installProceess1 += *res1;
*installProceess1 += *res2;



//project number 1
project* summerCpp;
summerCpp = new project(4);
summerCpp->setProjectName("Summer quest");
for (int j = 0; j < 4; j++)*summerCpp += *process[j];//add 4 tasks into the
project



summerCpp->printInfo();//print information about the summer project




//project number 2
project* oath = new project(4,"Oath project");
for(int j=0;j<4;j++)*oath += *process[j];//add 4 tasks into the project

//project number 3
project* winter = new project(4, "Winter project");
for (int j = 0; j < 4; j++)*winter += *process[j];

winter->printInfo();
```

```
oath->printInfo();

summerCpp->printInfo(summerCpp->searchlist(process[3]->getNumberOfTask()));//find and print by unique id
int indexToPrint = summerCpp->searchlist(process[3]->getNumberOfTask());//get index to print
*summerCpp -= indexToPrint;//remove index to print
summerCpp->printInfo(summerCpp->searchlist(process[3]->getNumberOfTask()));//try to print the index that had removed
summerCpp->printInfo();//print the whole project.
}//end of demo

int choice, choice1;//choices of the switch case
project *proj[MAX_PROJ];//list of projects that the program can contain
bool flag = 0;//flag of keep runing the while loop of the main menu
int index = 0; // genric index project that saving the last position of the task of t
int i = 0;//index counter
proj[index] = NULL;//set the first project as NULL
int numberOfTasks = 0, taskNumber = 9000;//numer of task index for cases 1,2,3 and tasknumber unique number for case 5
string projectName;
cout << "Do you want to start a new project ? (if yes press 1, if no press 0)" << endl;
cin >> choice;
while (!flag) {//while flag 1 the main menu will keep runing
while ((choice != 0) & (choice != 1)) // choice  - if you want to open a project or not
{
```

```
                cin.clear();//to prevent a loop and flash the input
                getc(stdin);
                cout << "Please try again\n";
                cin >> choice;
        }
        if (choice == 1) // choice1 - what do you want to do in this project
        {
                cout << "Please choose which project type do you want :\n1.Empty
project\n2.Project with tasks\n3.Project with name and tasks\n4.manage a project by its
name\n5.manage a project by its unique number\n6.print info of all projects\n0.EXIT" << endl;
                cin >> choice1;//get choice for main menu


                switch (choice1)
                {
                case 1:  //create an empty project
                        while (index < MAX_PROJ)//if not in the limitation of max
project number
                        {
                                if(proj[index]==NULL)//if its initlized for use as NULL
and its ready to use
                                {
                                        proj[index] = new project();
                                        if (index == MAX_PROJ - 1)break;//if its the
last one stop here
                                        proj[index + 1] = NULL;//continue and put
the next index at null value
                                        index++;//move the index foward
                                        break;
                                }
                                index++;
```

```
                    }
                    if(index==MAX_PROJ-1)//if the project list is full show
massage to user
                    cout << "\nThe project list is FULL!" << endl;
                    break;



                case 2:  //constructor with number of task
                    while (index < MAX_PROJ)//if less then max number project
allowed
                    {
                        if (proj[index] == NULL)//if its initlized for use as
NULL and its ready to use
                        {
                            cout << "Please enter number of tasks:" <<
endl;//set number of tasks
                            cin >> numberOfTasks;
                            cin.clear();//to prevent a loop and flash the
input
                            proj[index] = new
project(numberOfTasks);//the rest of here the same as case 1
                            if (index == MAX_PROJ - 1)break;
                            proj[index + 1] = NULL;
                            index++;
                            break;
                        }
                        index++;
                    }
                    if (index == MAX_PROJ-1)
                        cout << "\nThe project list is FULL!" << endl;
```

```
                    break;
                case 3:
                    while (index < MAX_PROJ)//if less then max number project
allowed
                    {
                        if (proj[index] == NULL)//if its initlized for use as
NULL
                        {
                            //constructor with name and number of
task
                            cout << "Please enter project's name:" <<
endl;
                            cin >> projectName;
                            cin.clear();//to prevent a loop and flash the
input
                            cout << "Please enter number of tasks:" <<
endl;
                            cin >> numberOfTasks;
                            cin.clear();//to prevent a loop and flash the
input
                            proj[index] = new project(numberOfTasks,
projectName);//the same as case 1 and 2
                            if (index == MAX_PROJ - 1)break;
                            proj[index + 1] = NULL;
                            index++;
                            break;
                        }
                        index++;
```

```
                    break;//prevent the while
                }
                if (index == MAX_PROJ-1)
                    cout << "\nThe project list is FULL!" << endl;
                break;
            case 4://find a project by its name and mange it
                projectName = "default";

                cout << "enter the name of the project" << endl;
                    cin >> projectName;
                    if(!index==0)//if project list is empty index is a pivot
of the last used index of project array
                        for (i = 0; i < index; i++)//find project by its
name, go threw all availble projects
                        {
                            if (proj[i]->getProjectName() ==
projectName)
                                proj[i] =
projectMenu(*proj[i]);
                            if (proj[i] == NULL)index--;
                        }
                    else//if not found
                    {
                        cout << "There is no such Project!" << endl;
                    }
                break;
            case 5://find a project by its unique project number

                cout << "enter the unique number of the project" <<
endl;//same as case 4 but here its using the unique id of the project
```

```
cin >> taskNumber;
if (!index == 0)//if project list is empty
	for (i = 0; i < index; i++)//find project by its name
	{
		if (proj[i]->getProjectNumber() ==
taskNumber)
			proj[i] = projectMenu(*proj[i]);
		if (proj[i] == NULL)index--;
	}
else
{
	cout << "There is no such Project!" << endl;
}

break;

case 6:
	if (!index == 0)//if project list is empty
	for (i = 0; i < index; i++)//find project by its name
	{
		cout <<
"*******************************" << endl;
		cout << "project number:" << i + 1 << endl;
		cout << "------------------------------" << endl;
		cout << "its unique Id is:" << proj[i]-
>getProjectNumber() << endl;
		cout << "project Name: "<<proj[i]-
>getProjectName() << endl;
		cout <<
"*******************************" << endl;
```

```
                        }
                        break;
                case 0:
                        //exit
                        flag = true;
                        break;
                 default:
                        cin.clear();
                        break;
                }
                cin.clear();//prevent a loop in the menu
                getc(stdin);


            };
        }
    }
    catch (string error)
    {
        cout << error<<endl;//show the error massage
    }
    catch (int error)
    {
        cout << "the value has set to BAD value, the value that havebeen set:" <<
error<<endl;//show the bad value
    }
    catch (...)
    {
        cout << "***fatal error***";
```

```
        }
}

string intDateToStringDate(int day, int month, int year)//int date to string date format DD / MM / YY
{
        //some modification to prevent bad values
        if (day > 31 || day < 1)day = 31;
        if (month > 12 || month < 1)month = 12;
        if (year < 1900 || year>2100)year = 2020;

        //int to string
        string dayS = to_string(day);
        string monthS = to_string(month);
        string yearS = to_string(year);
        string brk = " / ";//space  / space its the format of the brake between the values
        string dateS = dayS + brk + monthS + brk + yearS;//create the string for use

        return dateS;//return the date


}

project* projectMenu(project &proj)//second menu for project mangemnt
{
        bool flag = 1;
        bool choice = 0;
        int choice2 , day=0, month=0, year=0,taskN;
        string pTmpSt = "default";//project tempory string for tempory use
```

```
int numberOfparticipants = 0;

cout << "Please enter your choice :\n1.Set\Change project name\n2.Add meeting\n3.Remove the last task from the project\n4.Find a task in project and show its information\n5.Show all the project data\n6.delete the project\n0.save and Exit" << endl;
cin >> choice2;
while (choice2 != 0)// choice2  - which option do you want to chose
{
        switch (choice2)
        {
        case 1://set project name

                cout << "\nenter the name of the project:" << endl;
                cin >> pTmpSt;
                proj.setProjectName(pTmpSt);

                break;

        case 2://add meeting
                while (globalInt < MAX_TOTAL_TASK)
                {
                        if (globalTaskList[globalInt] == NULL)
                        {

                                //create a meeting
                                setVarsOftasks(globalInt);
                                //add the task into the task list of proj Project list by using operator +=
```

```
                    proj.operator+=(*globalTaskList[globalInt]);
                    //end of list limitation
                    if (globalInt == MAX_TOTAL_TASK - 1)break;
                    globalTaskList[globalInt + 1] = NULL;//if not in the end of list
put the next one in the list as NULL
                    globalInt++;
                    break;//end here if all done well, and this task had been
added to this project
                }
            }
            break;//jump here if smth went wrong end of list or smth else

        case 3://remove the last task from the project
            cout << "\nremoving the last task in the project" << endl;
            if (proj.getIndexTask() >= 0)
                proj -= proj.getIndexTask();//remove the last one
            break;
        case 4://print one task of index by its unique taskNumber
            cout << "\nenter the number of the task:" << endl;
            cin >> taskN;

            proj.printInfo(proj.searchlist(taskN));//print info of one task
            break;
        case 5:
            cout << "\nthe info of all task:" << endl;
            proj.printInfo();//print info of one task
            break;
        case 6://delete the project
```

```
                    cout << "Are you sure you want to delete this project? press 1 to delete" <<
endl;
                        cin >> choice;
                        if (choice==1)
                        {
                    cout << "\nremoving project" << endl;
                     proj.~project();
                     cout << "\project removed" << endl;
                     choice2 = 0;//exit
                     return NULL;
                        }
                        break;
            default: cout << "Please try again\n"<<endl;
                    break;
            };
            cin.clear();//prevent loop
            cout << "Please enter your choice :\n1.Set\Change project name\n2.Add
meeting\n3.Remove the last task from the project\n4.Find a task in project and show its
information\n5.Show all the project data\n6.delete the project\n0.save and Exit" << endl;
            cin >> choice2;
        }
        return &proj;//return this project after stoped working on it
}

void setVarsOftasks(int globalIndex)//initilize task into a project
{

        ///variables that will be in use in the function
        string location, iniDate, finalDate, taskName,currency;
```

```
int choice = 0, numberOfparticipants=0,amountOfMoney=0,resources=0;
bool tests = 0;
string pTmpSt = "default";
int day, month, year;
cout << "\nenter the name of the meeting" << endl;
cin >> taskName;

//get from the user and set initial date
cout << "\nenter the inital date of the meeting" << endl;
cout << "\nenter the day "; cin >> day;
cout << "\nenter the month "; cin >> month;
cout << "\nenter the year "; cin >> year;
iniDate = intDateToStringDate(day, month, year);

//get from the user and set final date
cout << "\nenter the final date of the task" << endl;
cout << "\nenter the day "; cin >> day;
cout << "\nenter the month "; cin >> month;
cout << "\nenter the year "; cin >> year;
finalDate = intDateToStringDate(day, month, year);

//choose if this task is a meeting /install/payment
cout << "\nIf its a meeting task enter 1\nIf its a install task enter 2\nIf its a payment task
meeting enter 3" << endl;
cin >> choice;
        switch (choice)
        {
                case 1://meeting choice
```

```
cout << "\nenter the location place" << endl;
cin >> location;
cout << "\nenter the number of participants" << endl;
cin >> numberOfparticipants;
//construct a task and keep it in the global task list
globalTaskList[globalIndex] = new meeting(iniDate, finalDate,
location, numberOfparticipants);
break;
case 2://install choice
cout << "\nenter 1 if tests included" << endl;
cin >> tests;
cout << "\nenter the number of resources" << endl;
cin >> resources;
//construct a task and keep it in the global task list
globalTaskList[globalIndex] = new install(iniDate, finalDate,
taskName, resources);

break;
case 3://payment meeting choice
cout << "\nenter the location place" << endl;
cin >> location;
cout << "\nenter the number of participants" << endl;
cin >> numberOfparticipants;
cout << "\nenter the amount of money that needed to pay" << endl;
cin >> amountOfMoney;
cout << "\nenter the currency of the money that needed to pay" <<
endl;
cin >> currency;
//construct a task and keep it in the global task list
```

```
                    globalTaskList[globalIndex] = new payment(iniDate, finalDate,
taskName, currency, location, numberOfparticipants, amountOfMoney);
                    break;


            default:
                    break;
        }
}
```

:Task.h

```
/*task.h*/

#ifndef STD_LIB
#define STD_LIB
#include<fstream>
#include<istream>

#include <iostream>
#include <string>
#include<ctime>
using namespace std;

#endif // !STD_LIB


#define _TASK_H
/*
class task
info about the class:task{this class contain information about the start of the task
,the end of the task and the name of the task}
abstract class: Y
derived class: N
child class of:
privet parameters in the class:
   string initDate - start of the task
   string finalDate - end of the task
   string name - name of the task
   const int numberTask - the number of the task
   static int taskCt - how many tasks

*/
```

```
class task
{
public:
	//Constracturs
	task(string initDate,string finalDate,string name);
	task();

	//Set Methods
	void setName(string name)throw(string);/*set the name of the task*/
	void setInitDate(string initDate)throw(string);//set initate date of a task
	void setFinalDate(string finalDate)throw(string);//set final date of a task

	//Get Methods
	string getName()const { return name; };
	string getInitDate()const { return initDate; };
	string getFinalDate()const { return finalDate; };
	int getNumberOfTask()const { return numberTask; };
	static int getTaskCt(){ return taskCt; };


	bool isExpiredA(string currentDate) const; /*chek if the task final date is
expired*/

	//Virtual Methods
	virtual void PrintT(ostream& out)const  = 0;/*it is a virtual printing
function,not working for this class*/

	//operators
	/*print operator*/
	friend ostream& operator<<(ostream& out, const task& ain)
	{
		out << "\nName of Task: "<<ain.getName();
		return out;
	}

	/*operator ==*/
	virtual bool operator==(const task& ain)
	{
		if (getInitDate() == ain.getInitDate() && getFinalDate() ==
ain.getFinalDate() && getName() == ain.getName())
			return true;
		else
			false;



	}
	//Distractors
	void removeT();
	~task();


private:

	string initDate;		/*start of the task*/
	string finalDate;		/*end of the task*/
```

```
        string name;                /*name of the task*/
        const int numberTask;       /* the number of the task*/
        static int taskCt;          /*how many tasks*/
};
```

:Task.cpp

```
#include "task.h"

int task::taskCt = 1000;

task::task(string initDate, string finalDate, string name):numberTask(taskCt++)
{
        setInitDate(initDate);
        setFinalDate(finalDate);
        setName(name);
}

task::task() :numberTask(taskCt++)
{
        setInitDate("1/1/1900");
        setFinalDate("30/1/1900");
        setName("Pray for Peace");
}

/*set the name of the task and checking if the name is ok*/
void task::setName(string name)throw(string)
{
        if (name == "") throw "Name is Empty String";  /*chack if the name is empty*/
        if (&name == nullptr) throw "Name is Null";  /*check if the name is null*/
        if (std::string::npos != name.find_first_of("0123456789"))
                throw "Name Contains Digit";/*check if there are digit in the name*/
        this->name = name;

}


/*set initate date of a task and checking if the date is real*/
void task::setInitDate(string initDate)
```

```
{
	if (initDate == "") throw "Date is Empty "; /*chack if the date is empty*/
	if (&initDate == nullptr) throw "Date is Null"; /*check if the date is null*/
	if (std::string::npos !=
name.find_first_of("ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz`!@#$%^&*()_\+
="))
		throw "Date Contains restedricted symbols";/*check if there are letters
or symbols in the date*/
	this->initDate = initDate;
}

/*set final date of a task and chacking if the date is real*/
void task::setFinalDate(string finalDate)
{

		if (finalDate == "") throw "Date is Empty ";/*chack if the date is
empty*/
		if (&finalDate == nullptr) throw "Date is Null";/*check if the date is
null*/
		if (std::string::npos !=
name.find_first_of("ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz`!@#$%^&*()_\+
="))
			throw "Date Contains restedricted symbols";/*check if there are
letters or symbols in the date*/

	this->finalDate = finalDate;
	if (this->isExpiredA(initDate)) throw "final date expired";

}

/*
reciving a string in format of "DD/MM/YY" end cheking if the object final date is
expired,
return TRUE if expired FALSE id not expired
*/
bool task::isExpiredA(string currentDate) const
{
	string tmpFinal = this->getFinalDate(), tmpCurrent = currentDate;
	string delimiter = " \ ", token0, token1;
	size_t pos0 = 0, pos1 = 0;
	int day[2], month[2], year[2];
	int i = 0;
	while ((pos0 = tmpCurrent.find(delimiter)) != string::npos)//cut the date
string and convert into 6 int
	{
		token0 = tmpCurrent.substr(0, pos0);
		token1 = tmpFinal.substr(0, pos1);
		if (i == 0)//first cut off the days
		{
			day[0] = stoi(token0);
			day[1] = stoi(token1);
		}
		if (i == 1)//second cut off the month
		{
			month[0] = stoi(token0);
			month[1] = stoi(token1);
```

```
		}
		if (i == 2)//third cut off the year
		{
			year[0] = stoi(token0);
			year[1] = stoi(token1);
		}
		i++;
		tmpCurrent.erase(0, pos0 + delimiter.length());
		tmpFinal.erase(0, pos1 + delimiter.length());
	}

	if (year[0] > year[1])//if current year is higher then final
		return true;//expired=true
	else
	{
		if (month[0] > month[1])//if current month is higher then final month
			return true;//expired=true
		else
		{
			if (day[0] > day[1])//if current day is higher then final day
				return true;//expired=true
		}



	}

	return false;
	return false;
}
/*free all allocation*/
void task::removeT()
{
	delete this;
}



task::~task()
{

}
```

:Meeting.h

```
#ifndef _TASK_H
#define _TASK_H
#include "task.h"
#endif // !_TASK_H

#ifndef STD_LIB
#define STD_LIB
#include<fstream>
#include<istream>

#include <iostream>
#include <string>
using namespace std;

#endif // !STD_LIB

#ifndef _PART_H
#define _PART_H
#include "participant.h"
#endif // !_PART_H

#define MAX_PPL 5

#define _MEETING_H

/*
class meeting
info about the class:meeting{this class contain information about the participants of
the meeting and have the meeting loction }
abstract class: N
derived class: Y
child class of:task
privet parameters in the class:
   int numberOfParticipants - number of participants
   participant* participantList[MAX_PPL] - the list of all the participants in the
meeting
   string location - the loction of the meeting

*/

class meeting:public task
{
public:


       //Constracturs
       meeting(string location, string initDate, string finalDate, string name, int
numberOfParticipants=0);
       meeting(  string initDate, string finalDate, string name, int
numberOfParticipants=0);
```

```
        meeting(string location, string initDate, string finalDate, string name);
        meeting();

        //Set Methods
        void setLocation(string location)throw(string);                    /*set loction
for the meeting*/
        void setNumberOfParticipants(int numberOfParticipants)throw(int); /*set number
of participants that will be in the meeting*/

        //Get Methods
        string getLocation()const { return location; };
        int getNumberOfParticipants()const { return numberOfParticipants; };

        //Bool function return 1 if expired and if not it return 0
         friend bool isExpired(string currentDate,string fDate);

         /*Operator +=*/
         meeting &operator+=(const participant &p);

         /*opertaor ==*/
         virtual bool operator==(const task& ing) const
         {
                if (((task*)this)->operator==(ing) == false) {
                        return false;
                }
                const meeting *meet = dynamic_cast<const meeting*>(&ing);
                if (meet->getLocation() == this->getLocation() && meet-
>getNumberOfParticipants() == this->getNumberOfParticipants())
                {
                        return true;
                }
                else return false;
         }


         //Print function
         void PrintT(ostream& out)const;

         //Distractors
        void removeA();
        ~meeting();


private:

        int numberOfParticipants;                /*number of participants*/
        participant *participantList[MAX_PPL];   /*the list of all the participants in
the meeting*/
        string location;                         /*the loction of the meeting*/
};
```

:Meeting.cpp

```
#include "meeting.h"

using namespace std;




meeting::meeting(string location, string initDate, string finalDate, string name, int
numberOfParticipants):task(initDate,finalDate,name)
{

	if (numberOfParticipants > MAX_PPL)
	{
		numberOfParticipants = MAX_PPL;
		cout << "Max participants in meeting:" << MAX_PPL <<"the value of
participant has changed to max value"<< endl;

	}
	setNumberOfParticipants(numberOfParticipants);
		this->setLocation(location);


}

meeting::meeting(string initDate, string finalDate, string name, int
numberOfParticipants):task(initDate, finalDate, name)
{
	this->setLocation("virtual:VC/ZOOM/Tel");
	setNumberOfParticipants(numberOfParticipants);
	int i = 0;


}

meeting::meeting(string location, string initDate, string finalDate, string
name):task(initDate, finalDate, name)
{
	int numberOfParticipants = 2;
	setNumberOfParticipants(numberOfParticipants);
	this->setLocation(location);
	int i = 0;

}

meeting::meeting():task()
{
	this->setLocation("home");
	this->setNumberOfParticipants(0);
}

/*set loction for the meeting and checking if the location name is not empty and not
contain digits*/
void meeting::setLocation(string location)throw(string)
{
```

```
	if (location == "") throw "loction  is Empty String";		/*check is the
location is not empty string*/
	if (&location == nullptr) throw "loction is Null";		/*check if th
location name is not null*/
	if (std::string::npos != location.find_first_of("0123456789"))	/*check if th
location name does not contain digits*/
		throw "loction name Contains Digit";			/*check if
th location name does not contain digits*/
	this->location = location;
}
/*set number of oarticipants in the meeting and check if the numbers is logical */
void meeting::setNumberOfParticipants(int numberOfParticipants)throw(int)
{
	if (numberOfParticipants < 1)
		throw numberOfParticipants;	/*check if the number of participant is
logical */
	string tmp;
	this->numberOfParticipants = numberOfParticipants;
	int i = 0;
	cout << "For task number: " << this->getNumberOfTask() << "\nenter details
about the participants.";
	for (; i < numberOfParticipants; i++)
	{
		this->participantList[i] = new participant();	/*alloction for
participant*/
		cout << "\nEnter info of particpant number "<<i+1 <<"\nnenter the name
of the participant: "; /*enter participant first name*/
		cin >> tmp;
		participantList[i]->setName(tmp);
		cout << "enter the name of the last name of participant: ";	/*enter
participant last name*/
		cin >> tmp;
		participantList[i]->setLastName(tmp);
		cout << "enter the name of the organization: ";		/*enter
name of the organization*/
		cin >> tmp;
		participantList[i]->setOrganization(tmp);
		cout << "enter the position in the organization: ";		/*enter
name of the  position in the organization*/
		cin >> tmp;
		participantList[i]->setPosition(tmp);
	}
}



/*??????*/
meeting & meeting::operator+=(const participant & p)
{
	if (this->getNumberOfParticipants() + 1 > MAX_PPL)
		cout << "Too many participants in the meeting" << endl;
	else
	{
		this->participantList[getNumberOfParticipants() + 1]-
>setName(p.getName());
```

```
              this->participantList[getNumberOfParticipants() + 1]-
>setLastName(p.getLastName());
              this->participantList[getNumberOfParticipants() + 1]-
>setOrganization(p.getOrganization());
              this->participantList[getNumberOfParticipants() + 1]-
>setPosition(p.getPosition());
       }
                      return *this;
}
/*print the information of the meeting -
id,name,initial date,final date,participants details*/
 void meeting::PrintT(ostream& out)const
{
        cout << "\nThe id of the meeting:" << this->getNumberOfTask();  /*id of the
meeting*/
       cout << "\nThe name of the meeting:" << this->getName();  /*na,e of the
meeting*/
       cout << "\nThe initial date of meeting:" << this->getInitDate();  /*initial
date of the meeting*/
       cout << "\nThe final date of meeting:" << this->getFinalDate(); /*final date of
the meeting*/
       cout << "\nThere are " << this->getNumberOfParticipants() << " in the
meeting\n\nThe details of the particpant:"<<endl;  /*the participants  details*/
       int i = 0;
       for (; i < getNumberOfParticipants(); i++)
       {
              cout << "participant number " << i + 1 <<endl;
              this->participantList[i]->printP();
       }

}

 /*free allocation*/
void meeting::removeA()
{
       int i = 0;
       for (; i < this->getNumberOfParticipants(); i++)
       {
              this->participantList[i]->removeP();
       }
       task::removeT();
}
/*free all alloction*/
meeting::~meeting()
{

              this->removeA();

}
/*checking if the date is expired -  if current date  == to final date tham the date
int expired*/
bool isExpired(string currentDate,string finalDate)
{
       meeting *tmp;
       bool expired ;
       tmp = new meeting();
```

```
        tmp->setFinalDate (finalDate);
        expired = tmp->isExpiredA(currentDate);
        return expired;
}
```

:Install.h

```
#ifndef _TASK_H
#define _TASK_H
#include "task.h"
#endif // !_TASK_H

#ifndef  _RESOURCE_H
#define _RESOURCE_H
#include "resource.h"
#endif // ! _RESOURCE_H

#ifndef _MEETING_H
#define _MEETING_H
#include "MEETING.h"
#endif // !_MEETING_H


#ifndef STD_LIB
#define STD_LIB

#include <iostream>
#include <string>
using namespace std;

#endif // !STD_LIB

#define MAX_AMOUNT_RESOURCE 10

#define _INSTALL_H

/*
class install
info about the class:install{this class contain information about what needed for
instal the object  -  how many and which type of resource needed  }
abstract class: N
derived class: Y
child class of:task
privet parameters in the class:
  bool testInclude - test
  int numberOfResource - number of resource
  resource* resourceList[MAX_AMOUNT_RESOURCE] - Resource reference

*/
class install :public task
{
public:

       //Constracturs
       install(int numberOfResource, bool test, string initDate, string finalDate,
string name);
       install(bool test, string initDate, string finalDate, string name);
       install(int numberOfResource, string initDate, string finalDate, string name);
       install();

       //Set Methods
```

```
	void setNumberOfResource(int numberOfResource)throw(int); /*set number of the
resources*/
	void setTestInclude(bool testInclude)throw(string);	/*if in the
installation included also test */

	//Get Methods
	bool getTestInclude() const { return testInclude; };
	int getNumberOfResource()const { return numberOfResource; };

	//Operators +=
	install& operator+=(const resource& r);

	//Opertator ==
	virtual bool operator==(const task& ing) const
	{
		if (((task*)this)->operator==(ing) == false) {
			return false;
		}
		const install* meet = dynamic_cast<const install*>(&ing);
		if (meet->getTestInclude() == this->getTestInclude() && meet-
>getNumberOfResource() == this->getNumberOfResource())
		{
			return true;
		}
		else return false;
	}


	//Virtual Methods
	virtual void PrintT(ostream& out)const; /*it is a virtual printing function,
not working for this class*/



	//Distractors
	void removeI();
	~install();


private:
	bool testInclude;				/*test*/
	int numberOfResource;				/*number of resource*/
	resource* resourceList[MAX_AMOUNT_RESOURCE]; /*Resource reference*/
};
```

:Install.cpp

```
#include "install.h"


install::install(int numberOfResource, bool test, string initDate, string finalDate,
string name):task(initDate, finalDate, name)
{
	this->setNumberOfResource(numberOfResource);
	this->setTestInclude(test);
}

install::install(bool test, string initDate, string finalDate, string name)
:task(initDate, finalDate, name)
{
	this->setNumberOfResource(0);
	this->setTestInclude(test);

}

install::install(int numberOfResource, string initDate, string finalDate, string name)
:task(initDate, finalDate, name)
{
	this->setNumberOfResource(numberOfResource);
	this->setTestInclude(0);
}

install::install():task()
{
	this->setNumberOfResource(0);
	this->setTestInclude(0);

}

/*
set number of the resources
and check if th number of resources is logic
*/
void install::setNumberOfResource(int numberOfResource=0)thro w(int)
{
	if (numberOfResource < 1)
		throw numberOfResource;
	string tmp;
	double tmp1 = 0.0;
	cout << "For task number: " << this->getNumberOfTask() << "\nenter details
about the resources."; /*enter details about the resources*/
		this->numberOfResource = numberOfResource;
		int i = 0;
		for (; i < numberOfResource; i++)
		{
			this->resourceList[i] = new resource;

			cout << "\nEnter details of resource number "<<i+1<<"\nEnter Name
of Resource: "; /*enter name of resources*/
			cin >> tmp;
			this->resourceList[i]->setNameOfResource(tmp);
```

```
                        cout << "\nEnter unit of mesure: ";
                        cin >> tmp;
                        this->resourceList[i]->setUnit(tmp);

                        cout << "\nEnter amount of unit of the resource: ";
                        cin >> tmp1;
                        this->resourceList[i]->setAmountOfResource(tmp1);
                }

}

/*if in the installation included also test */
void install::setTestInclude(bool testInclude)throw(string)
{
        if (testInclude != 0 && testInclude != 1)throw("Bad bool value"); /*check if
the value is correct*/
        this->testInclude = testInclude;
}

/*??????*/
install & install::operator+=(const resource & r)
{
        if(this->getNumberOfResource()+1>MAX_AMOUNT_RESOURCE)
                cout << "Too many Resource in the install" << endl;

        else
        {
                this->resourceList[getNumberOfResource() + 1]-
>setAmountOfResource(r.getAmountOfResource());
                this->resourceList[getNumberOfResource() + 1]-
>setNameOfResource(r.getNameOfResource());
                this->resourceList[getNumberOfResource() + 1]->setUnit(r.getUnit());
        }
        return *this;
}

/*print the information of the install -
name of the install,initial date,final date,number of resources*/
void install::PrintT(ostream& out)const
{
        cout << "\n\nThe name of the install:" << this->getName();
        cout << "\nThe initial date of install:" << this->getInitDate();
        cout << "\nThe final date of install:" << this->getFinalDate();
        cout << "\nThere are " << this->getNumberOfResource() << " in the
installation";
        int i = 0;
        for (; i < getNumberOfResource(); i++)
        {
                this->resourceList[i]->printR();
        }
}


/*free alloction*/
void install::removeI()
```

```
{
	int i = 0;
	for (; i < this->getNumberOfResource(); i++)
	{
		this->resourceList[i]->removeR();
	}
	task::removeT();
}



install::~install()
{
	removeI();
}
```

:Payment.h

```
#ifndef _MEETING_H
#define _MEETING_H
#include "meeting.h"
#endif // !_MEETING_H
#ifndef STD_LIB
#define STD_LIB
#include<fstream>
#include<istream>

#include <iostream>
#include <string>
using namespace std;

#endif // !STD_LIB
#define _PAYMENT_H

/*
class payment
info about the class:payment{this class contain information about a ameeting that in
that neeting it needed to get pay}
abstract class: N
derived class: Y
child class of: meetinng and task
privet parameters in the class:
   int amountOfCurrency - how much money needed
   string currency - the type of the currency

*/
class payment:public meeting
{
public:
	//Constracturs
<<<<<<< HEAD

	payment(string currency, string location, int numberOfParticipants, string
initDate, string finalDate, string name, int amountOfCurrency = 1);
=======
	payment( string currency, string location, int numberOfParticipants, string
initDate, string finalDate, string name, int amountOfCurrency = 1);
>>>>>>> 5fd974218d193c097b82f44d48a4e7fce5aecc9e
	payment();

	//Set Methods
<<<<<<< HEAD
	void setAmountOfCurrency(int amountOfCurrency )throw(int);/*set how much money
needed*/
	void setCurrency(string currency); /*set the type of the currency*/
=======
	void setAmountOfCurrency(int amountOfCurrency )throw(int);
	void setCurrency(string currency);
>>>>>>> 5fd974218d193c097b82f44d48a4e7fce5aecc9e

	//Get Methods
	int getAmountOfCurrency()const { return amountOfCurrency; };
	string getCurrency()const { return currency; };
```

```
	//Virtual Method
<<<<<<< HEAD
	virtual void PrintT(ostream& out)const; /*it is a virtual printing function,
not working for this class*/
=======
	virtual void PrintT(ostream& out)const;
>>>>>>> 5fd974218d193c097b82f44d48a4e7fce5aecc9e

	//Distractors
	void removePA();
	~payment();

private:
<<<<<<< HEAD
	int amountOfCurrency; /*how much money needed*/
	string currency;/*the type of the currency*/
=======
	int amountOfCurrency;
	string currency;
>>>>>>> 5fd974218d193c097b82f44d48a4e7fce5aecc9e

};
```

:Payment.cpp

```
#include "payment.h"

payment::payment(string currency, string location, int numberOfParticipants, string
initDate, string finalDate, string name, int amountOfCurrency):meeting( location,
initDate,  finalDate,  name, numberOfParticipants)
{
	this->setCurrency(currency);
	this->setAmountOfCurrency(amountOfCurrency);
}

payment::payment():meeting()
{
	this->setCurrency("NIS");
	this->setAmountOfCurrency(1);
}
/*set how much money needed and check if the payment is ok*/
void payment::setAmountOfCurrency(int amountOfCurrency)
{
	if (amountOfCurrency < 0)
		throw amountOfCurrency;/*checking if the amount of currency is logic or
real*/
	this->amountOfCurrency = amountOfCurrency;
}
/*set the type of the currency*/
void payment::setCurrency(string currency)
{
	this->currency = currency;
}
/*print the information of the meeting - amount of money needed to pay*/
void payment::PrintT(ostream & out) const
{
	meeting::PrintT(cout);
	cout <<"\nThe amount of money that need to pay:"<<getAmountOfCurrency() <<" "<<
getCurrency()<<endl;

}
/*free meeting allocation*/
void payment::removePA()
{
	meeting::removeA();
}
/*free payment alloction*/
payment::~payment()
{
	this->removePA();
}
```

:Participants.h

```
#ifndef STD_LIB
#define STD_LIB

#include <iostream>
#include <string>
using namespace std;

#endif // !STD_LIB


#define _PART_H

/*
class participant
info about the class:participant{this class contain information about the participant
in the meetings}
abstract class: N
derived class: Y
privet parameters in the class:
   string nameP - name of the participant
   string lastName - last name of the participant
   string organization - name of the organization
   string position - the participant position int the organization
*/
class participant
{
public:
	//Constracturs
	participant(string nameP,string lastName ,string organization,string position);
	participant();

	//Set Methods
	void setName(string nameP)throw(string); /*set the name of the participant */
	void setLastName(string lastName)throw(string);/* set the last name of the
participant*/
	void setOrganization(string organization)throw(string); /* set the name of the
organization*/
	void setPosition(string poistion)throw(string); /* set the participant position
int the organization*/

	//Get Methods
	string getName()const { return nameP; };
	string getLastName()const{ return lastName; };
	string getOrganization()const { return organization; };
	string getPosition()const { return position; };

	//Print function
	void printP()const;

	//Distractors
	void removeP();
	~participant();
```

```
private:
	string nameP; /*name of the participant*/
	string lastName; /*last name of the participant*/
	string organization;/*name of the organization*/
	string position;/*the participant position int the organization*/

};
```

:Participants.cpp

```
#include "participant.h"


participant::participant(string nameP, string lastName, string organization, string
position)
{
	setName(nameP);
	setLastName(lastName);
	setOrganization(organization);
	setPosition(position);
}

participant::participant()
{
	setName("Mario");
	setLastName("Mario");
	setOrganization("Lala Land");
	setPosition("Hero");
}
/* set name of the participant and check if the name is logic*/
void participant::setName(string nameP)throw(string)
{
	if (nameP == "") throw "Name is Empty String"; /*check if the name is empty*/
	if (&nameP == nullptr) throw "Name is Null";  /*check if the name is null*/
	if (std::string::npos != nameP.find_first_of("0123456789")) /*check if the name
contain digits*/
		throw "Name Contains Digit";
	this->nameP = nameP;
}
/*set last name of the participant and check if the name is logic*/
void participant::setLastName(string lastName)throw(string)
{
	if (lastName == "") throw "last Name is Empty String";/*check if the last name
is empty*/
	if (&lastName == nullptr) throw "last Name is Null";/*check if the last name is
null*/
	if (std::string::npos != lastName.find_first_of("0123456789"))/*check if the
last name contain digits*/
		throw "last Name Contains Digit";
	this->lastName = lastName;
}
/* set name of the Organization and check if the name is logic*/
void participant::setOrganization(string organization)throw(string)
{
	if (organization == "") throw "name of the organization is Empty
String";/*check if the Organization name is empty*/
	if (&organization == nullptr) throw "Name of the organization is Null";/*check
if the Organization name is null*/
	/*the Organization name can contain digits*/

	this->organization = organization;
}
/* set participant position int the Organization and check if the name is logic*/
void participant::setPosition(string position)throw(string)
{
```

```
	if (position == "") throw "name of the postion is Empty String";/*check if the
postion is empty*/
	if (&position == nullptr) throw "Name of the postion is Null"; /*check if the
postion is null*/
	this->position = position;
}
/*print the information of the participant -
name of the participant,last name,organiztion name,Position in the organization*/
void participant::printP()const
{
	cout << "\nName of particpant: " << this->getName();
	cout << "\nLast Name: " << this->getLastName();
	cout << "\nName of the Organization: " << this->getOrganization();
	cout << "\nPosition in the organization: " << this->getPosition();
}
/*free alloction*/
void participant::removeP()
{
	delete this;
}

participant::~participant()
{
	this->removeP();
}
```

:Resource.h

```
#ifndef STD_LIB
#define STD_LIB
#include<fstream>
#include<istream>

#include <iostream>
#include <string>
using namespace std;

#endif // !STD_LIB

#define _RESOURCE_H
/*
class resource
info about the class:resource{this class contain data of all the resources needed to
install each project}
abstract class: N
derived class: N
privet parameters in the class:
  double amountOfResource - amount of resource
  string nameOfResource - the name of the resource
  string unit - unit name
*/
class resource
{
public:
	//Constracturs
	resource(string nameOfResource,string unit,double amountOfResource);
	resource();

	//Set Methods
	void setNameOfResource(string nameOfResource)throw(string);	/*set the name of
the resource*/
	void setUnit(string unit)throw(string);				/*set the name of
the unit */
	void setAmountOfResource(double amountOfResource)throw(int);	/* set the amount
of resources*/

	//Get Methods
	string getNameOfResource()const {  return nameOfResource;};
	double getAmountOfResource()const { return amountOfResource; };
	string getUnit()const {return unit;};

	//Print function
	void printR()const;

	//Distractors
	void removeR();
	~resource();


private:
	double amountOfResource; /*amount of resource*/
	string nameOfResource;  /*the name of the resource*/
	string unit;            /*unit name*/
```

```
};
```

:Resource.cpp

```
#include "resource.h"


resource::resource(string nameOfResource, string unit, double amountOfResource)
{
	setNameOfResource(nameOfResource);
	setUnit(unit);
	setAmountOfResource(amountOfResource);
}

resource::resource()
{
	setNameOfResource("Tech");
	setUnit("hour");
	setAmountOfResource(1.0);

}

/*set the name of the resource,check if the name is logic */
void resource::setNameOfResource(string nameOfResource)throw(string)
{
	if (nameOfResource == "") throw "Name is Empty String";/*check if the name is
empty*/
	if (&nameOfResource == nullptr) throw "Name is Null";/*check if the name is
null*/
		if (std::string::npos !=
nameOfResource.find_first_of("0123456789"))/*check if the name contain digits*/
			throw "Name Contains Digit";
	this->nameOfResource = nameOfResource;
}
/* set the amount of resources,check if the name is logic */
void resource::setAmountOfResource(double amountOfResource)throw(int)
{
	if (amountOfResource < 0)
		throw amountOfResource; /*checking if the amount of resource is logic or
real */
	this->amountOfResource = amountOfResource;
}
/*set the name of the unit, check if the name of the unit is real and logic */
void resource::setUnit(string unit)throw(string)
{
	if (unit == "") throw "Unit name is Empty String";/*check if the name is
empty*/
	if (&unit == nullptr) throw "Unit name is Null";/*check if the name is null*/

	this->unit = unit;
}
/*print the information of the resource -
name of the resource,amount of resources*/
void resource::printR() const
{
	cout << "\n\nName of Resource: " << this->getNameOfResource();
	cout << "\n\namount: " << this->getAmountOfResource()<<" " <<this-
>getUnit()<<endl;
```

```
}
/*free resource allocation*/
void resource::removeR()
{
	delete this;
}

resource::~resource()
{

}
```

Project.h:

```
#ifndef _MEETING_H
#define _MEETING_H
#include "meeting.h"
#endif // !_MEETING_H
#ifndef _INSTALL_H
#define _INSTALL_H
#include "install.h"
#endif // !_INSTALL_H

#ifndef _PAYMENT_H
#define _PAYMENT_H
#include "payment.h"

#endif // !_PAYMENT_H
#ifndef STD_LIB
#define STD_LIB
#include<fstream<
#include<istream<

#include <iostream<
#include <string<
using namespace std;

#endif // !STD_LIB

#define _PROJECT_H
*/
class project
info about the class: project
```

}this class can Bind into it a set of tasks according to the participant's input
and actually allow the user access to functions that give an overall view of the project{.
abstract class: N
derived class: N
privet parameters in the class:
string projectName - the name of the project
int totalProjectTask - total tasks in the project
task** taskList - task list
int indexTask - index of each task
/*
class project
}
public:

```
        //constructor
        project;()
        project(int totalProjectTask,string projectName);
        project(int totalProjectTask);


        void setTotalProjectTask(int totalProjectTask)throw(int); /*set the project total tasks/*
        int getTotalProjectTask()const { return totalProjectTask; } ;

        void setProjectTasks(int totalProjectTask); /*set the project tasks/*


        void setIndexTask()throw(int); /*set the index of each task/*
        int getIndexTask()const { return indexTask; };//get project name

        void setProjectName(string projectName)throw(string); /*set the project name/*
        string getProjectName()const { return projectName; };//get project name
```

```
int getProjectNumber() const{ return numberProject; };//return the unique number of
project

int searchlist(int taskNumber); /*search if the task is at the task list/*
void printInfo()throw(string); /*this function print the information of the project/*

void printInfo(int i); /*print the index of each task/*

*/operator/*=+
void operator+=(task& other)
}

        this->setIndexTask;()

        if (this->totalProjectTask > this->getIndexTask())
        }
                        this->taskList[this->getIndexTask()] = &other;
        {



{



*/operator/*=-
void operator-=(int other)
}
        if (this->taskList[other-1])
        }
```

```
                    this->taskList[other-1]->removeT;()
                    this->taskList[other-1] = NULL;
                    setIndexTask;()

                {

        {
        //Distractor
~   project;()

private:
        string projectName; /*the name of the project/*
        int totalProjectTask;  /*total tasks in the project/*
        task **taskList;  /*task list/*
        int indexTask;  /*index of each task/*
        const int numberProject;      /* the number of the project/*
        static int projCt;          /*how many project/*
; {
```

Project.cpp:

```
#include "project.h"
int project::projCt = 0;
project::project():numberProject(projCt++)
{
	this->setProjectName("default"+to_string(numberProject));
	this->setIndexTask();
	this->setTotalProjectTask(10);
	this->setProjectTasks(10);
	cout << "\n****project " << getProjectName() << " was created****\n" << endl;
}

project::project(int totalProjectTask,string projectName):numberProject(projCt++)
{
	this->setProjectName(projectName);
	this->setIndexTask();
	this->setTotalProjectTask(totalProjectTask);
	this->setProjectTasks(totalProjectTask);
	cout << "\n****project " << getProjectName() << " was created****\n" << endl;
}

project::project(int totalProjectTask) :numberProject(projCt++)
{
	this->setProjectName("default"+ to_string(numberProject));
	this->setIndexTask();
	this->setTotalProjectTask(totalProjectTask);
	this->setProjectTasks(totalProjectTask);
	cout << "\n****project " << getProjectName() << " was created****\n" << endl;
}
/*set the project total tasks,check if the total check is logic*/
```

```
void project::setTotalProjectTask(int totalProjectTask)throw(int)
{
	if (totalProjectTask < 0)
		throw totalProjectTask; /*check if the total check is logic*/
	if (totalProjectTask)
		this->totalProjectTask = totalProjectTask;
}

/*set the project tasks*/
void project::setProjectTasks(int totalProjectTask)
{
	if (totalProjectTask)
	{
		this->taskList = new task *[totalProjectTask];

		int i = 0;
		for (; i < totalProjectTask; i++)
		{
			this->taskList[i] = NULL;
		}
	}
	else this->taskList = NULL;

}


/*set the index of each task*/
void project::setIndexTask()throw(int)
{
	int i = 0;
```

```
        for (i = 0; i < this->totalProjectTask; i++)
        {
                if (this->taskList[i] == NULL)
                {

                        this->indexTask = i;
                        return;
                }
                if((indexTask<0)||(indexTask>totalProjectTask))throw(indexTask);
        }

}

/*set the project name, check if the name of the project is logic*/
void project::setProjectName(string projectName)throw(string)
{
        if (projectName == "") throw "Name of the project is Empty String"; /*check if the
name is empty*/
        if (&projectName == nullptr) throw "Name of the project is Null"; /*check if the name
is null*/

        this->projectName = projectName;
}



/*search if the task is at the task list*/
int project::searchlist(int taskNumber)
{
        setIndexTask();
        for (int i = 0; i < this->getIndexTask()+1; i++)
        {
```

```
                if (this->taskList[i] && taskNumber == this->taskList[i]->getNumberOfTask())
return i;
        }
        cout << "\nThere is no such a task!" << endl;  /*if there is no task like the user insert */
        return -1;

}

/*this function print the information of the project*/
void project::printInfo()throw(string)
{
        cout <<
"\n*************************************************************************\n\nProject " << this-
>getProjectName() << ", info of the tasks";
        this->setIndexTask();
        for (int i = 0; i < this->getIndexTask(); i++)
        {

                if (this->taskList[i])
                {
                        cout << "\n-----------------------------------------------------------------------
-----\n";
                        cout << "\nTask number: " << i + 1 << ",the id of the task is: " << this-
>taskList[i]->getNumberOfTask() << endl;

                        this->taskList[i]->PrintT(cout);
                        cout << "\n-----------------------------------------------------------------------
-----\n";
                }
                else
                {
                        cout << "\nThere is no such a task!" << endl;
                }
```

```
        }
        cout << "\n*********************************************************************\n";
}

/*print the index of each task*/
void project::printInfo(int i)
{



                if (this->taskList[i]  && i>=0)
                {
                        cout << "\n-----------------------------------------------------------------------
-----\n";
                        cout << "\nTask number: " << i + 1 << ",the id of the task is: " << this-
>taskList[i]->getNumberOfTask() << endl;
                        this->taskList[i]->PrintT(cout);
                        cout << "\n-----------------------------------------------------------------------
-----\n";
                }
                else
                {
                        cout << "There is no such task in the list!" << endl;
                }


}


/*Distractor and free alloction*/
project::~project()
{
        for (int i = 0;  i < this->getTotalProjectTask();  i++)
```

```
        {
                if(this->taskList[i])
                        this->taskList[i]->removeT();
        }
        delete[] this->taskList;
}
```